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HOW INDIAN FIRMS ARE DEPLOYING THE EVER EVOLVING SUPPLY CHAIN PRACTICES: AN EXPLORATORY STUDY

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***Abstract*— This paper presents a comparative analysis of Supply Chain Management (SCM) practices of twenty-five select firms in India. Our exploratory study covers a wide spectrum of firms. These comprise retail chains, logistic service providers, Fast Moving Consumer Goods (FMCG) companies, a hotel, a power generation unit, electrical and electronic goods manufacturers, automobile companies and their ancillaries. Field visits to at least one major facility of these firms were carried out during the year 2005. On-site observations and informal discussions and interviews with middle and top managers are the primary sources of data. These were substantiated with data and information from secondary sources.**

We specifically focus on supply chain structures; facilities network design; transportation and logistics; collaborations and partnerships; and the role of Information and Communications Technologies (ICT). Comparative analysis of SCM practices of these firms indicates various similarities, differences, emergent trends as well as areas of concern. Finally, directions for future research are suggested.

***Index Terms*— Supply chain management practices, on-site observations, comparative analysis, exploratory study, Information and Communications Technologies (ICT), India.**

I. INTRODUCTION

Supply Chain Management (SCM) has grown rapidly over the past several years mainly due to an increase in corporate goals of reducing costs and at the same time ensuring quick and timely deliveries in right quantities at right places to the ever-demanding customers. Firms, both in manufacturing as well as in services, face many challenges in getting the best out of their suppliers, in-house operations and logistics and distribution channels. Their supply chain structures, facilities network design, collaborations and partnership strategies, forecasting methodologies as well as implementation and utilization of information and communications technologies (ICT) are assuming greater significance in meeting these challenges. This is specifically true in a developing country like India.

Supply chain management practices and principles are evolving and changing rapidly. The challenges for manufacturing firms are shifting from internal efficiency to supply chain efficiency. These changes affect the ways supply chains are designed, the way they are managed and how planning and control activities take place within these chains. But how far have companies come in dealing with supply chain issues? What practices do they focus on or need to focus on? The ongoing MIT Supply Chain 2020 (SC2020) research initiative suggests that companies need to closely integrate themselves into the supply network, carefully manage the complexity that ensues, align their business strategy with supply chain operations, leverage information and communication technology with process improvement and pioneer operational innovation for superior firm performance. Companies also need to rigorously execute against critical operational performance metrics, such as customer service, responsiveness, supply chain cost, asset utilization, product quality and operational flexibility in order to achieve overall business success.

India is one of the world's fastest-growing economies with diverse markets. India is the fourth largest country in terms of purchasing power parity (PPP) currently. It constitutes one of the fastest growing markets in the world and is counted among the richest with regard to cheap skilled labor, scientific and technological resources, and entrepreneurial talents. Managing supply chain in such a vast country is quite challenging for any organization because of business practices, government regulations, technology capability, transportation infrastructure, etc.

The Growth Competitiveness Index survey conducted by the Geneva -based World Economic Forum (WEF) for 2005-06 puts India in 50th position among 117 countries in its Global Competitiveness Report, 5 places up from previous years ranking of 55. The survey is composed of three component indices: the technology index, the public institutions index, and the macroeconomic environment index. These indexes are calculated on the basis of both "hard data" and "Survey data." The 2005 World Competitiveness Year Book, compiled by the Switzerland-based International Institute for Management

Development (IIMD), shows that India's ranking in international competitiveness, evaluated by applying 314 criteria, has gone up to 41st out of 60 countries.

Increasing uncertainty of supply networks, globalization of businesses, proliferation of product variety and shortening of product life cycles have forced Indian organizations to look beyond their four walls into supply chains (Sahay and Mohan, 2003). Changes in the environment have been so dramatic and sudden that Indian organizations have realized the inappropriateness of competing effectively in isolation from their suppliers and other associates of supply chain. Rather, the need for adopting collaborative methodologies, at this stage, is more than ever before because of the recent economic deregulation and globalization of the Indian industry. While emerging markets offer opportunities they also bring along new rivals. For most Indian organizations, which have hardly ever operated in an "open" economy, working along with the right business partners (suppliers, customers and service providers), fostering trust between them and designing the right system of gauging performance is altogether a new ball-game. Further, Information and Communications Technologies (ICT) are re-defining the rules of economic and trading relationships within the country. Hence, it has become necessary for Indian organizations to look for methodologies and processes that produce maximum efficiency both within and beyond their operations.

This paper aims to assess the current state of supply chain management practices followed by Indian organizations. Are Indian firms on the right path of managing their supply chain practices to enhance their competitiveness in this changing economic environment? The research study is borne out of the felt need by managers, expert professionals and academicians to address supply chain practices at the national level. The research team set out with to gauge the current status of supply chain management practices in Indian industry in order to address the felt concern of Indian policy makers and managers. We capture facts, figures as well as qualitative responses about the supply chain practices in organizations. This study presents a snap-shot view of SCM practices comprising a wide spectrum of firms in India. We observe SCM practices in these firms to identify emergent trends as well as areas of concern and also find scope for improvements. We cover a wide spectrum of firms covering a wide nature of business so as to get a reasonable insight into SCM practices. The same is shown in the Table 1. Figures in brackets represent the number of firms in that business.

Table 1

Nature of Business of Firms Covered in Present Study
Automobiles (5)
Food and Apparel Retail Chains (4)
FMCG (3)
Auto-ancillary (2)
Electrical Appliances and Switchgear (2)
Computers (1)
Hotel (1)
Tannery (1)
Global travel, financial and network services provider (1)
Power Generation (1)
Sales and Distribution of Electronic Consumer Products (1)
Milk and Milk Products (1)
International Logistics Service Provider (1)
Domestic Transport Service Provider (1)

II. METHODOLOGY

On-site observations (at least one major facility) and informal discussions and interviews with middle and top managers form the basic research methodology for this exploratory study. We then, substantiate the information gathered with those from secondary sources. We focus mainly on facilities network design, collaboration and partnerships with upstream supply chain, collaboration and partnerships with downstream supply chain, transportation and logistics, implementation and utilization of ICT and forecasting and meeting consumer demand. This is followed by comparative analysis of SCM practices and presentation of our findings/ inferences. Finally, we mention the limitations of our study and suggest scope for future work.

III. LITERATURE REVIEW

SCM is a management philosophy that seeks to unify productive competencies and resources of the company and channel partners into an integrated supply system. It focuses on developing innovative solutions and synchronizing the flow of market place products, services and information to create unique individualized sources of customer value. Alternatively, it may be defined as a set of approaches utilized to efficiently integrate suppliers, producers, stocking centers and retailers at all levels so that goods are produced / acquired and distributed in right quantities to right locations and at right time in order to minimize system-wide costs while satisfying service level requirements.

It is a concept involving the integration of all the value-creating elements in the supply, manufacturing, and distribution processes, from raw material extraction, through the transformation process, to end user consumption. SCM activities are motivated by the ideals of customer service, compression of lead time, and inventory reduction. SCM is

facilitated greatly by the latest in ICT, such as Electronic Data Interchange (EDI), Radio Frequency Identification Devices (RFID), cellular mobile technologies and the Internet. This permits quick communication of end-consumer demand to the upstream stages of the supply chain.

Much of the available literature on SCM is concerned with advocating SCM practices and the improvement in performance brought about by these practices. Fox (1991) urges manufacturers to treat the entire supply chain as an enterprise and integrate the flows across the supply chain in order to reduce costs and to improve customer service. Michael (1996) stresses the importance of synchronization in the entire supply chain, and advocates strengthening any weak links in the supply chain, particularly manufacturing. This was needed to ward off impending competitive pressures in manufacturing. However, Akkermans et. al (1999) states that the operations management literature has shown very little empirical evidence of successful strategic moves towards supply chain management and we do not yet have causal relationships between the various factors driving effective supply chain management and their interrelations with performance improvements in areas like inventory management, supply chain costs, and customer satisfaction.

Dyer and Ouchi (1993) extol the virtues of Japanese-style business partnerships, and urge for its wider adoption. Much of the success of Japanese industry is attributed to these partnerships which consist of exclusive or semi-exclusive supplier-purchaser relationships whose goal is to increase quality and minimize total costs. The supplier relationship aspects of SCM have their roots in the JIT concept of lean management and supplier base reduction (Tully, 1995). Trust and communication replace the traditional adversarial relationship with the suppliers. SCM is also concerned with the management of the movement and placement of inventories. Increasingly, ICT is being used as a substitute for inventory resulting in cost savings and quicker customer response. Lurquin (1996) and Beesley (1997) discuss ways of achieving reduced cycle time through supply chain initiatives focusing on process improvements across the supply chain. Ragatz et al. (1997) find that supplier memberships in new product development teams contributed significantly to the success of these teams. The mechanism through which SCM improves a firm’s performance hinges on lead time reduction (Towill, 1996). This results in savings, quality improvements, customer satisfaction and improvement in competitive position.

The above is just a sampling of the literature that elaborates on SCM concepts and their effectiveness. How widely are these concepts implemented in practice? What is their effect on the firms’ performance? While there is plenty of published literature that explains or espouses SCM, there is a relative lack of empirical studies examining SCM practices and their effects. New and Payne (1995) have described an empirical study investigating the power interplay in supply chain partnerships. They find that the relationships are asymmetrical, depending on whether it was with upstream or downstream organizations. Galt and Dale (1991) study ten organizations in the U.K., and find that they are working to reduce their supplier base, and to improve their communications with the suppliers. Fernie (1995) carries out an international comparison of SCM in the grocery retailing industry. He finds significant differences in inventory held in the supply chain by the U.S. and European grocery retailers, which could be explained by their SCM adoption. In a similar vein, Tan et al. (1998) seek a relationship between firms' SCM practice and their performance. They show positive and significant correlation between certain SCM practices and performances of their respondent firms. Kwan (1999) investigates the use of ICT in SCM in Singapore electronics and chemical industries and finds that the top barrier to the use of ICT is the lack of education and training.

Worldwide, interest in supply chain management has increased steadily since the 1980s when organizations began to see the benefits of collaborative relationships (Gattorna, 1998). The management concept is, however, nascent in India. There is little literature on SCM practices in India. Previous studies are mainly based on questionnaire surveys and secondary data sources (Sahay and Mohan, 2003 and Sahay et. al, 2006). These studies have found that Indian manufacturers were generally lagging behind in their counterparts in the developed countries.

IV. Supply Chain Management Practices

SCM requires quick movement of materials and information and close communication. The integration of supply chains attempts to elevate the linkages within each component of the chain, to facilitate better decision making and to get all the pieces of the chain to interact in a more efficient way. With the emergence of the personal computer, optical fiber networks, the explosion of the Internet, mobile technologies and the World Wide Web, the cost and availability of ICT resources allows easy linkages and eliminates information related time delays in any supply chain network. The focus presently is, therefore, on leveraging emergent ICT to create supply chain visibility.

Tan (2002) investigate the contemporary practices and concerns of supply chain management using a survey of senior supply and materials management professionals in the U.S. The study also relates the practices and concerns to firms' performance by means of bivariate correlation and multiple linear regression analysis. Some of the key SCM practices that impact performance listed are related to estimation of customer needs, efficient and effective delivery, integration and collaboration throughout the supply chain, strong sharing of information and vision using ICT as well as informal methods and use of specialists for performing specific jobs across the supply chain. Customer Service includes the measurement of the quality of customer-facing activities, such as on-time delivery and perfect order ratio. Responsiveness refers to the speed of response to customer needs and includes

measurements such as lead time, delivery speed, and time-to-market. Supply Chain Cost represents the total cost to serve customers and its components including inventory cost, logistics costs, etc. Asset Utilization refers to metrics such as inventory turn. Product Quality refers to both the quality of the products and the quality of product-based services. Operational Flexibility measures an organization's ability to satisfy customers' changing needs in a timely manner. He concludes that all of the significant supply chain management practices positively impact performance. Practices are related to various activities related to SCM such as purchasing, information sharing, customer service management and JIT capability. Table 2 briefly describes a few relevant purchasing and customer relation practices.

Table 2
Purchasing and Customer Relation Practices

Purchasing Practices	Customer Relation Practices
Commodity teams set supplier goals	Predict customers' expectations
Supplier Certification – Product and Process	Predict factors affecting customer relationship
Use suppliers' technical support	Enhance customer support
Visit suppliers' facilities regularly	Evaluate customer complaints
Share confidential information	Measure customer satisfaction
Negotiate annual price on key terms	Follow up with customers for feedback

Olhager and Selldin (2004) while studying the supply chain strategies of 128 Swedish firms conclude that the main overall objectives for the design of supply chains are resource utilization and cost minimization. They specifically study issues related to the supply chain design, integration, planning and control and ICT tools for managing supply chains. Their findings concern future supply chain management practices, principles and priorities. These indicate that the extent to which suppliers and customers are involved in supply chain planning and control is expected to increase steadily over the next few years. Quality is the primary priority for the selection of supply chain partners. In addition, delivery dependability, cost efficiency, volume flexibility, and delivery speed are also considered to be important inputs to the supply chain partner selection process. Forecasting is the prime area for collaborative efforts. Companies show relatively high awareness of modern supply chain planning and control tools. However, the utilization of such tools is still at a relatively low level. Companies are starting to appreciate the importance of the supply chains in which they operate. However, most firms have quite some ways to go to take full advantage of the promises of supply chain integration. The awareness of planning and control techniques and communication means is high, and work on increasing and improving supply chain integration and collaboration will be intensified in the near future.

The ongoing MIT Supply Chain 2020 (SC2020) classifies supply chain practices into following five broad categories:

1. Supply Chain Integration with customers, suppliers and across the internal organization. From the functional perspective, integrated collaborative product development is included.
2. Complexity Management to cope with supply chain complexity in a cost-effective way.
3. Aligning Strategy and Supply Chain so as to integrate supply chain management well into the strategic planning of a company and thus make it a CEO-level agenda.
4. Information and Communication Technology (ICT) with Process Improvement as a means of adoption of advanced supply chain management software combined with process improvement.
5. Operational Innovation for creating and implementing leading-edge practices and technologies in supply chain management.

It provides statistical evidence of the correlation between certain supply chain practices and performances. Table 3 gives the correlation between practices and performance.

Table 3
Correlation between Supply Chain Management Practices and Performances

SCM Practices	Correlation with SCM success
SCM Cooperation	0.4
Production Flexibility	0.35
Integrated SCM Organization	0.3
Complexity Management	0.3
Collaborative Planning	0.27
SCM Controlling System	0.22

Msimangira (2003) discusses supply chain management practices, with emphasis on purchasing, in Botswana (a developing country). He focuses on problems facing business operations and how to improve the situation. In fact, primary concerns for successful SCM implementation need to be identified and addressed. Tan (2002) lists a nine important supply chain concerns such as lack of sophisticated ICT infra-structure, insufficient integration due to lack of trust and collaboration among the supply chain stakeholders and thereby lack of supply chain effectiveness and efficiencies. The same are reproduced here in Table 4.

Table 4
Supply Chain Management Concerns [Source: Tan (2002)]

Lack of sophisticated information and communication systems
Lack of ability in managing SC inventories
Lack of cooperation among supply chain members
Lack of trust among supply chain members
Firms lack of leverage within its supply chain
Lack of interest among firm's suppliers and/ or customers
Firm's suppliers' geographical distance
Competition from other supply chains
Firm's customers' geographical distance

V. Supply Chain Practices of Leading Firms Worldwide

Wal-Mart in retail industry and Dell Computers in computer industry were able to achieve leadership positions because of their efficient and effective supply chain management practices. Both of these have invested enormously in ICT to help them have continued focus on customer needs and supply chain efficiencies. Many instances of novel and innovative supply chain practices such as cross-docking, Collaborative Planning, Forecasting and Replenishment (CPFR), extensive use of bar-codes and even RFID (Radio Frequency Identification Devices) and direct-to-home delivery were introduced by these firms. Wal-Mart had its own satellite communication system as early as 1983. Transportation costs and inventory -turns of these firms are better than those of their competitors. The savings in costs were passed o to the consumers, thereby adding value at every stage ad process.

VI. Supply Chain Practices in India

Before the 1990s, Indian organizations operated in a protected environment. There was very little competition even amongst domestic players. Business was driven by almost monopolistic strategies. However the de-regulation of the Indian economy in the last decade has attracted global players in every industrial sector and has unleashed a new competitive spirit. A distinctive characteristic of the Indian economic environment is the inadequacy of basic inputs normally required to support organized economic activity. The Indian infrastructure – comprising roads, railways, airports, seaports, ICT and energy production – is considered very poor as compared with other developed and developing countries. However, things are changing for the better at a fast pace. Today, the overall Indian infrastructure is rated 50th among 117 countries (World Economic Forum, 2006).

To succeed today and to pave the way for a better future, Indian organizations need to create strong linkages with their business partners using the concept of supply chain management. More and more Indian organizations today are realizing the importance of developing and implementing a comprehensive supply chain strategy – and then linking this strategy to the

overall business goals. Technology, which was earlier mistaken to be a driver for doing business in a particular fashion, has become a "necessary" enabler for aligning business to consumer demand. It can change the way we capture and analyze information, differentiate products and services, configure and sell existing products, crash order cycle times, introduce new products and so on and so forth. ICT can thus achieve breakthroughs in the area of supply chain design, configuration and planning, which otherwise can never be thought about. Not surprisingly, ICT tools for Indian organizations are still a luxury with organizations still preparing themselves to harness its power to improve supply chains. However, to compete in today's environment ICT tools are a necessity. The size of the organization does not matter as fortunately the cost of technology has been reduced so that even the smallest organization can now afford them. Worldwide, best-in-class companies have invested in enabling infrastructure and technology to realize their supply chain vision into a reality. These include integrated supply chain cost models for decisive inventory management, technology for handling supply chain throughput, and information systems capable of fostering visibility across functional and organizational boundaries. However, successful supply chain management at the enterprise level depends heavily on the state

of the infrastructure scenario in the country. Undoubtedly, the state of infrastructure in India has been impacting the industrial and economic performance for long. It requires a concerted effort by the industry and government to dismantle bottlenecks in the completion of infrastructure -related projects and creation of demand-aligned capacities in sectors of logistics and information technology.

VII. COMPARATIVE ANALYSIS OF SCM PRACTICES OBSERVED

As already stated, we cover a wide array of firms involved in diverse businesses such as global travel, financial and network services, food and apparel retail, milk and milk products, health services, sales and distribution of electronic consumer products, power generation, electrical appliances and switchgears, hospitality, international logistics service, domestic transport service, automobiles and auto-ancillary, FMCG and computers. Similarly, we took care that these firms also provide diversity in terms of ownership and industry sectors. The same is shown in Table 5. This gives ample evidence that the firms cover a broad spectrum so as to provide satisfactory sample for assessing SCM practices in India. It may be noted that in sector-wise classification, some firms may fall in more than one category. Further, we did carry out some sector-wise detailed analysis of SCM practices some of which is presented briefly here.

Table 5

Categorization of Firms Covered in Present Study

Ownership-wise	Sector-wise
Indian Subsidiaries (10)	Manufacturing as core (8)
Family-owned (11)	Services as core (6)
Joint Ventures (4)	Automobiles Sector (7)
	FMCG and Perishables (5)
	Retail Chains (3)
	Logistics Service Providers (2)

We mainly focus on supply chain structures, facilities network design, forecasting and meeting consumer demand, transportation and logistics, collaborations and partnerships and

implementation and utilization of information and communications technologies (ICT) while carrying out the comparative analysis. In firms with manufacturing as the core process, primary focus is still on manufacturing though trend towards contract manufacturing is on the upswing. Quality assurance has become an order qualifier rather than being an order winner. The emergence of Service Level Agreements (SLAs) with internal customers could be seen in most of the firms. Presently, they are still informal in nature and not strictly binding. Firms have few manufacturing facilities with 20-24 warehouses and many dealers. This number of warehouses is a direct consequence of the tax-holidays and prevalent excise and custom duty structures. For small dedicated manufacturers located close to their prime buyer, a warehouse may not be required all. High collaboration and partnerships with vendors is strongly evident in this sector.

There is big focus on vendor development. Firms also focus on developing vendors in geographical proximity. Another discernible trend is the gradual shifting of responsibilities and risks to vendors. Most of these small firms have negligible bargaining power with big OEM vendors/ buyers. Automobiles sector is the dominant sector within manufacturing among the firms studied. There is collaboration and partnerships downstream with the dealers as well. Transportation and logistics being non-core activities are generally outsourced. As regards implementation and utilization of ICT, 6 out of 8 firms use standard Enterprise Resource Planning (ERP) software, while one uses in-house developed legacy software. The firms appreciate the importance of inventory and order tracking, Wide Area Network (WAN) and Extranet besides the Internet. So, they seem to be catching up very fast with their counterparts in the developed world. However, forecasting still based on targets from dealers/ sales force. This is an area where they are relatively much behind.

In firms with manufacturing as the core, primary focus is on efficient and effective service and better customer reach. Most of these firms have established highly responsive call centers with stringent performance metrics. The focus of most of the firms in the sample was on express deliveries and logistics solutions. High collaboration and partnerships with partners can be seen. The firms are generally going for global procurement and long-term strategic deals. They have multiple channels downstream so as to achieve door-step reach to the ever-increasing customer base in India. Transportation and Logistics is generally through company fleet or outsourced. Routing and scheduling software are increasingly being used for these activities. 5 out of 6 firms use standard Enterprise Resource Planning (ERP) software. There is high focus on tracking of customer orders and customer care and technologies like bar codes and even Global Positioning Satellite (GPS) are being employed. Production process is mainly “pull” system.

In FMCG and perishables sector, the primary focus is on product availability (refilling the shelves). The companies have few manufacturing facilities with complex distribution channels. Packaging is generally outsourced (Mostly, the goods are packaged near the markets). There is a very high collaboration with suppliers and firms are going for global procurement. E-procurement is on the rise. At the same time, firms are negotiating long -term strategic deals. There are multiple channels downstream so as to meet the objective of next-door reach. Transportation and logistics services are generally outsourced to third parties. Transportation is mainly by road and the lead-time of these supply chains may be as high as 9-12 weeks. This is quite understandable, given the size of India and the state of its infra-structural facilities. Here too, most of the firms use ERP and forecasting still based on data from dealers/ sales force.

In retail chains, primary focus is on expansion and reaching the consumer. The sector is witnessing tremendous growth with increasing acceptability by the growing Indian middle class. Two of the retail chains in our study are low cost mass market players, while the third one is mainly into branded apparel. Their facilities are expanding to meet the increasing demands. These firms have their own warehouses and retail outlets. The layouts of these facilities are still evolving (Most of them are smaller replica of retail chains in the developed countries or famous shopping cities like Singapore and Dubai). The firms have high collaboration and partnerships with their suppliers who are generally located in close proximity. Transportation and Logistics is outsourced. The implementation and utilization of ICT is still limited. One firm uses ERP and another uses in-house developed Resource Enterprise Management (REM). These firms have not only gone for bar coding of items, but are pilot testing RFID and other smart card technologies as well. Forecasting still based on historical data which is tinkered by management decision

VIII. CONCLUSIONS

We cover a wide spectrum of firms with at least one field visit and also substantiate on-site observations and informal discussions and interviews with data and information from secondary sources. Thus we assess the current level of supply chain practices as suggested by Sahay et. al (2006). We not only identify and compare the SCM practices of these firms but also discern various emergent trends and areas of concern. We also suggest opportunities for improvements. Indian organizations need to act fast to capitalize on these opportunities to be competitive with the world market. Our study reveals that most Indian firms have aligned their supply chain objectives with their business objectives. However, due to some aberrations and diseconomies of scale/ scope most of them are not able to reap full potential benefits. Our study highlights that action is required by the Indian government to improve the infrastructure for better functioning of various supply chains. The study may help the Indian industry to benchmark their supply chain practices vis-a`-vis supply chain practices in other countries.

Based on our exploratory study, some emergent trends can be discerned. There is a growing focus on customer and end-consumer in terms of higher product availability, customer reach, and responsiveness. Concepts like Customer Relationship Management (CRM) are being tried. For most of the firms, there exists a good facilities network design under given constraints. A very conspicuous trend is that of higher degree of collaboration and partnerships both upstream and downstream the supply chain. The degree is different in different firms. However, the economy of scale/ scope for supply chain entities to experience win-win situations is still awaited. Transportation and logistics are getting due attention and as a result some good third party and fourth party logistics service providers have emerged. There is a growing trend towards implementation of ICT. However, forecasting still not based on POS data

Our study reveals many areas of concern. One of the major areas of concern with most of the firms is related to redesigning their facilities network after VAT implementation. This will require not only strategic redesign but also involve lots of other consideration related to relocation of facilities and reallocation of capacities. The level of collaboration and partnerships upstream the supply chain still requires significant efforts, specially in non-automobile firms. Concepts like Vendor Managed Inventory (VMI), revenue sharing and long-term contracts are exceptions rather than norms. Same applies to level of collaboration and partnerships downstream where trust and genuine information sharing are conspicuous by their absence. There are numerous infra-structural bottlenecks for transportation and logistics and various stakeholders need to address it on an urgent basis. ICT implementation is costly and many times has not been utilized to its full potential. Given advances in other supply chain practices, it was really disheartening to note that for most firms, forecasting is still not based on Point-Of-Sale (POS) data. Another point to note is that India is still a sellers' market despite growing competition and this has introduced inertia in some supply chains. Growing incomes and consumer awareness will probably force such supply chains to shed this inertia.

There are many avenues for improvements for supply chain management practices in Indian firms. We are in total agreement with Tan (2002) that a massive commitment by important stakeholders is required for evolving truly efficient and effective supply chains. There is ample scope for facilities network redesign, specially in context of the VAT-regime. Infra-structural bottlenecks need to be overcome. The golden quadrilateral project and initiatives by railways and ports administration in the last few months are good indicators that the concerned authorities are waking up. There is a need for greater collaboration and trust among supply chain partners. ICT implementation and utilization is low and needs to be

spruced up. Perhaps, Forecasting based on POS data will come into use once there is more collaboration and trust, economies of scale and scope for supply chain entities and enabling-ICT are in place. Benchmarking and learning good practices should be encouraged by government, industry associations and other stakeholders.

IX. LIMITATIONS OF OUR WORK

We present only a snap-shot view of the SCM practices of a few select firms. The firms were selected as a convenience sample and so may not be truly representative. Further, ours is only an exploratory study with substantiation form secondary sources.

X. FUTURE RESEARCH DIRECTIONS

This research opens the way for in-depth studies of some of the areas of concern identified for supply chain management practices. Similarly, further research can be carried out using a specific case to study supply chain management practices at firm level in detail. Business- to-business transaction in India is at an infancy stage. Some detailed study may be carried out in this area. Finally, research could also focus on establishing actual performance improvements in supply chain management reflected in cost-saving and customer satisfaction effects.

REFERENCES

[1] Akkermans, H., Bogerd, P. and Vos, B. (1999), "Virtuous and vicious cycles on the road towards international supply chain management", International Journal of Operations & Production Management, Vol. 19, No. 5/6, pp. 565-581.

[2] Basnet, C., Corner, J., Wisner, J. and Tan, K-C., (2004), "Supply Chain Management: Practice and Performance in New Zealand",(Available at: www.mngt.waikato.ac.nz/depts/mnss/chuda/Supply Chain Management/)

[3] Beesley, A., (1997), "Time Compression in the Supply Chain", Logistics Information Management, Vol.10, No. 6, pp. 300–305Lurquin, M.G., (1996), "Streamlining the Supply Chain in the Pharmaceuticals Industry", Logistics Information Management, Vol. 9, No. 6, pp. 6–10

[4] Dyer, J.H., and Ouchi, W.G., (1993), "Japanese- style Partnerships: Giving Companies a Competitive Edge", Sloan Management Review, Vol. 38, No. 1, pp. 42-53.

[5] Fernie, J., (1995), "International Comparisons of Supply Chain Management in Grocery Retailing", Service Industries Journal, Vol. 15, No. 4, pp. 134-147.

[6] Fox, M.L., (1991), "Logistics Planning: The Supply Chain as an Integrated Enterprise", Production and Inventory Management, Vol. 11, No. 7, pp. 12-15.

[7] Galt, J.D.A., and Dale, B G., (1991), "Supplier Development: A British Case Study", International Journal of Purchasing & Materials Management, Vol. 27, No. 1, pp. 16-22.

[8] Kwan, A.T.W. (1999), "The Use of Information Technology to Enhance Supply Chain Management in the Electronics and Chemical Industries", Production & Inventory Management Journal, Vol. 40, No. 3, pp.7-15.

[9] Michael, D.R., (1996), "Is Manufacturing a Weak Link in Your Supply Chain?", Industrial Management, Vol. 38, No. 6, pp. 1-3.

[10] Msimangira, K.A.B. (2003), "Purchasing and supply chain management practices in Botswana", Supply Chain Management: An International Journal, Vol. 8, No. 1, pp. 7-11.

[11] New, S.J., and Payne, P., (1995), "Research Frameworks in Logistics: Three Models, Seven Dinners and a Survey", International Journal of Physical Distribution & Logistics Management, Vol. 25, No. 10, pp 60-77.

[12] Olhager, J. and Selldin, E., (2004), "Supply chain management survey of Swedish manufacturing firms", International Journal of Production Economics, Vol. 89, No. 3, pp. 353–361.

[13] Ragatz, G., Handfield, R. and Scannell, T. (1997), "Success Factors for Integrating Suppliers into New Product Development", Journal of Product Innovation Management, 14, 190-202.

[14] Sahay, B.S. and Mohan, R. (2003), "Supply chain management practices in Indian industry", International Journal of Physical Distribution & Logistics Management, Vol. 33, No. 7, pp. 582-606.

[15] Sahay, B.S., Gupta, J.N.D. and Mohan, R. (2006), "Managing supply chains for competitiveness: the Indian scenario", Supply Chain Management: An International Journal, Vol. 11, No. 1, pp. 15-24.

[16] Tan, K.C. (2002), "Supply Chain Management: Practices, Concerns, and Performance Issues", The Journal of Supply Chain Management, Vol. 35, No. 1, pp. 51-62.

[17] Tan, K.C., Kannan, V.R., and Handfield, R.B. (1998), "Supply Chain Management: Supplier Performance and Firm Performance", International Journal of Purchasing & Materials Management, Vol. 34, No. 3, pp. 2-9.

[18] Towill, D.R., (1996), "Time Compression and Supply Chain Management – a Guided Tour", Logistics Information Management, Vol. 9, No. 6, pp. 41–53Tully, S., (1995), "Purchasing's New Muscle", Fortune, Vol. 20, pp. 76.