

---

# Emerging Supply Chain Challenges in India: An Overview of Key Considerations

*A literature review for  
IMS 3310: International Business  
Instructor: Dr. Shawn Carraher*

Brian Kihneman  
*The University of Texas at Dallas, Richardson, Texas, USA  
Fall 2014*

---

## Abstract

**Purpose** – The purpose of this paper is to explore supply chain challenges and opportunities in India by providing a synthesis of prevailing ideas related to improving the current state of supply chain management and networks.

**Methodology** – A range of supply chain literature from 1985 to 2014, with a focus on India and emerging markets, was analyzed and outlined into a framework of India's evolving business context to provide decision-making insight.

**Findings** – Supply chain management enhances the firm's ability to maintain a competitive advantage in a dynamic business environment. India's internal markets are growing in complexity and maintaining flexibility/responsiveness to uncertainty factors is important. More efficient demand planning and inventory management is needed. Distribution networks need to reorganize to better serve rural markets and adapt to specific environments, while reducing channel fragmentation and transaction costs. Collaboration across the value chain through IT integration and strategic partnerships will confer significant advantages etc.

**Limitations** – These findings are limited to an overview of past and current literature covering supply chain management with a focus on India. Further research on India's current IT adoption and development of its logistics infrastructure will be informative. Additional research opportunities exist for reverse logistics, cold chain development, cross-cultural logistics, integrating end-user marketing with SCM, and detailed location modeling based on the current tax structure.

**Practical Implications** – A comprehensive overview of how to effectively utilize the supply chain to cope with emerging issues and achieve competitive advantages may be useful for new managers and entrepreneurs seeking a contextual summary of India's situation.

**Value** – The value lies in the paper's goal of integrating key insights on optimizing the current state of supply chain systems in the context India's evolving business landscape.

**Keywords** – India, supply chain management, emerging and regional economies, development, strategic planning, innovation

**Paper type** – Literature review

## Overview of the business context

### *Implications of supply chain management (SCM) for India*

*Introduction.* The importance of SCM in the future cannot be denied as business complexity and consumer demand builds up in India. Supply chain strategy becomes a focal point when firms face challenges of adapting to changing factors in the business environment (Sahay and Mohan, 2003). A key developing area within SCM is specialized market orientation by accessing and responding to target customers (Gundlach et al. 2006). Deep penetration of nascent markets will require responsive supply chains to target specialized needs – including internal demand for core commodities, fresh and abundant food, product differentiation, and high-quality service. Furthermore, rising agricultural and industrial output will require concurrent expansion of effective supply chain networks and necessitate growth in logistics. India experiences healthy growth in natural gas production and is projected to quadruple its steel output to 300 million tons by 2025 (EIA, 2014). Indian manufacturing firms are spending around 12 to 15 percent of annual revenue on logistics functions, and emphasis on supply chain initiatives should continue as the manufacturing sector grows (Nagarajan et al. 2013). A third of India's industrial production comes from small manufacturing enterprises and this small-scale sector is beginning to realize the importance of SCM as a tool to increase competitiveness (Thakkar et al. 2012). Economies of scale will grow alongside industry and SCM will allow firms to leverage this increasing scalability. The importance of coordinating with channel intermediaries across expanding networks and integrating with other core functions illustrates the importance of optimizing supply chains for the future.

*Cultivating a regional mindset.* Regional strategies are prudent in a culturally and geographically complex country such as India. “Think globally and act locally,” as applied in the Indian context, is a phrase that encapsulates the perspective that supply chain managers should focus their attention on regional integration – even as India becomes more globally connected. Resources in the home country do not necessarily confer advantages when transferred to another country (Cuervo-Cazurra et al. 2007). It will be important to capitalize on India’s high-growth markets by realizing localized market needs, and managing longer cross-country supply chains will be necessary as regional integration increases. On the other hand, too much supply chain overextension may increase exposure to complexity and uncertainty factors (Prater et al. 2001). Managing complexity will be a central theme for India’s supply chain managers. Despite a regional focus, improving global connectivity by integrating supply chains with external networks should also remain a strategic goal. With globalization comes increased complexity, and organizations are streamlining their supply chains to manage this complexity (Sahay and Mohan, 2003).

*Improving performance.* Aligning SCM strategy with overall business strategy is important to achieve competitive advantage. Widening portfolios, shorter product lifecycles, and more discerning customers all add to the increasing business complexity that firms will face in India’s opening economy. The supply chain will need to be prioritized. SCM performance metrics such as value chain optimization, responsiveness, delivered quality, speed-to-market, and order fulfillment are becoming increasingly important to Indian managers. Other valued objectives include customer service, improved delivery time, expanding depth of distribution, and flexibility of product mix. These metrics reflect the need to align core management strategies with supply chain processes (Sahay et al. 2006). Ultimately, supply chain management is an

integral link between cost reduction and customer satisfaction. Its usefulness will be compounded by the scalability of India's emerging markets.

### *Opportunities presented by India and emerging markets*

*Economic profile.* Emerging markets, such as India, are ready markets – or “instant markets” – where firms have the unique opportunity of responding to arising needs. Changes in the perception of emerging markets are exemplified by India's economic profile: a higher rate of income growth than developed countries, increasing purchasing power of its consumers, many opportunities for untapped markets, and low-cost/high-quality sources. A startling economic reality, if projections hold true, is that India's middle class will double by 2015 (from 2010 levels) and grow by an additional 500 million by 2025 (Kharas, 2011). India's per capita income grew by 10 percent in the recent year. India will have the fastest growth rate in liquid fuels consumption by 2020 as its population is expected to grow 1.3 percent each year (EIA, 2014). Moreover, India's rural market is projected to be larger than the entire consumer markets of South Korea and Canada (McKinsey, 2007). Reaching these mass markets is a paramount challenge and opportunity facing supply chains.

*Reaching target markets and first-mover advantages.* Distribution channels will need to be optimized (by reducing fragmentation) to reach India's emerging markets. Penetrating these nascent consumer markets will confer significant first-mover advantages. For example, in India where collectivism and group conformity are cultural factors in market demand, being able to first introduce innovative new products (often popular foreign brands) will help a first-mover capture sales revenue, before a bandwagon effect occurs (Rahman and Bhattacharyya, 2003). Localized talent who understand the cultural landscape will be invaluable to supply chains

needing to respond to specific target markets. Once again a regional mindset is advisable. To use a parallel example in the Finnish market, Kaipio and Leppanen (2005) found that focusing on local brands and products was best for capturing market share, and bringing new products to specific regions is very opportunistic. Product differentiation will be a key facet of more discerning consumer bases. Capitalizing on this is aided by developing new competencies to drive innovation and customization of products (Coleman 2007). India's urban segments will obviously provide opportunities as well. Rapid urbanization means economies of scale can be achieved more readily (Rahman and Bhattacharyya, 2003). Furthermore, the deregulation and liberalization of emerging markets is beneficial for new market entrants. India's "protective" economic policies are fading away and presenting easier market entry (Sahay and Mohan, 2003).

### *Outline of the paper: dimensions of the supply chain context*

The remainder of the paper will be categorized into three dimensions which encompass the challenges and opportunities that characterize supply chain management in India. There is general consensus in the literature that managers should take into consideration the following:

1. ***An evolving business situation:*** flexibility and responsiveness to uncertainty factors via collaboration and integration
2. ***Infrastructure and distribution in a dynamic environment:*** the state of distribution channels in the context of reaching mass markets (i.e. a rural focus)
3. ***Institutional concerns:*** implications involving tax structure and economic reforms

Concluding the paper will be a discussion of ***research gaps*** and areas of promising development.

## **An evolving business situation**

### *Flexibility and responsiveness to external factors*

*1.1 Uncertainty and flexibility.* Environmental uncertainty is a concern for businesses in emerging markets (Nagarajan et al. 2013). The supply chain operates within an uncertain environment so the need for it to maintain flexibility is crucial (Beamon, 1999). Uncertainty in India's fast-growing business environment will continue to be an important concern for firms seeking to optimize their supply chain. Supply chains must be flexible to changing conditions since competitive advantage is often temporary (Christopher and Holweg, 2011). In India, uncertainty can be characterized by many dimensions:

- Rising income levels; growing and more demanding consumers
- Shorter product lifecycles
- Diversity and unpredictability of supply/demand
- Rural dispersion and rapid urbanization
- Price volatility of inputs
- Increased competition
- Technological advancement

All of these dimensions exemplify India's evolving business situation and several of them have obvious consequences for firms with demand-driven supply chains. Volatile demand is a primary factor of environmental uncertainty (Lee et al. 1997). Building flexibility into the supply chain is paramount for Indian firms who want to manage uncertainty and respond to these demand-driven factors. Industries that face short product lifecycles, market volatility, demand uncertainty, and unreliable supply are often in need of flexibility across the supply chain to maintain

competitiveness (Jain and Benyoucef, 2008). “Flexibility” is an overanalyzed concept, so a brief and rudimentary discussion will inform the reader of its integral role in supply chains. There are numerous examples in the literature acknowledging that supply chain flexibility is a main driver of performance (Vickery et al. 1999). Flexibility is how a firm can adjust its supply chain to accommodate changes in production and distribution requirements/levels. It is a multi-dimensional construct – a response mechanism to uncertainty – that is often analyzed in conjunction with the characteristics of emerging markets (as previously listed). Vickery et al. (1999) described several flexibility dimensions of relevant importance:

- Adjusting to sudden changes in demand
- Reaching widespread markets effectively
- Handling product variation; customer specification

Maintaining flexibility in a dynamic environment is paramount. Supply networks in India are extending into complex geo-economical environments requiring accurate forecasting across the entire value chain to maintain flexibility. To begin with, flexibility requires efficient demand forecasting and inventory management. Unfortunately, many Indian firms need to drastically improve their forecasting and inventory management capabilities (discussed in next section). Moreover, flexibility requires better information flow via integrated IT systems. The union between IT integration and supply chain integration in India is still in development, and this union is key to handling forecasting discrepancies across long distances. Synchronizing demand-driven data, consumer response, EDI, point of sales data, and improving real-time coordination between strategic partners are all factors that enhance flexibility across the supply chain. For example, India’s leading personal care products company, FMCG, drastically improved its supply flexibility by sharing point of sales data across its integrated distribution network. Indeed,



sharing quality information is important. But certain tradeoffs exist between flexibility and uncertainty as theorized by Prater et al. (2001). When conditions of inefficient demand forecasting and environmental uncertainty increase, as is prevalent across some Indian industries, flexibility should be decreased to reduce complexity across the supply chain. In other words, supply chain flexibility exhibits diminishing returns as external uncertainty increases. Efficient information processing and logistics can help mitigate external vulnerabilities that increase complexity. Although an acknowledged method of improving responsiveness and performance flexibility is not a cure-all solution.

*1.2 Inventory management and demand uncertainty.* Responding to uncertainty requires efficient inventory management. Nonetheless, Indian organizations are not focusing enough on inventory management as a means of cost reduction. Demand-driven variability across distribution channels is high in India. The effect on inventory levels is unsatisfactory. Indian industry in recent times has maintained very high levels of raw and finished goods inventories compared to global standards – largely carried throughout the supply chain. Reducing inventory in downstream intermediaries is important to increase speed-to-market and product flow. Countering demand uncertainty, high monthly seasonality, and hedging against price changes are some of the reasons why Indian organizations hold relatively high amounts of inventory. “Research indicates that on average Indian firms carry 33.41 days of raw materials and 14.25 days of WIP” (Sahay et al. 2006). The long turnaround times at Indian ports is considered a major source of the problem too. The lead time in India is also high, indicating a need for stronger buyer/supplier relationships and information sharing. Over 60 percent of firms surveyed by Sahay and Mohan (2003) reported lead times of one week or greater, including 15.8 percent with lead times of over one month. Less than half of the firms indicated that their demand

forecasting techniques were producing accuracy within 10 percent, resulting in higher inventory holding costs. Lead times are further increased by many organizations that still implement push-based systems, despite inadequate forecasting and information flow across the supply network. Push-based systems, which are dependent on long-term forecast data from retailers, are prevalent throughout Indian industry despite markets increasingly requiring more customized and diversified products (Sahay and Mohan, 2003). Apparently, managers still believe that demand uncertainty can be offset by oversupplying distribution networks. Yet, there is consensus that implementing a pull-based system across the value chain is effective at lowering total cost. A case study by Christopher and Holweg (2011) describes how one firm sought to overcome “structural rigidity” in its supply chain, which included long lead times and high inventory levels, by replacing its forecast-driven system (push-based) with a demand-driven system (pull-based). Knowing which system to implement depends on many factors. Generally, a pull-based system is effective for everyday products (longer sales windows) with low to moderate demand variability, or products with high variability and low economies of scale. Perhaps even a hybrid push-pull system is advisable. Regardless, a pull-system requires highly responsive collaboration between channel intermediaries (the notion of “collaboration” will be thematic throughout this paper). Integrated IT systems make implementing a pull-based strategy more effective at reducing total inventory cost by providing collaborators with synchronized knowledge of actual demand changes. Case studies performed by McCarthy and Golicic (2002) showed that inter-firm collaborative forecasting reduced safety stock and excess inventory. They also suggested unifying demand projections between intermediaries to improve responsiveness.

*1.3 Towards collaboration.* According to Sahay and Mohan (2003), the Indian business environment is changing so rapidly that organizations are realizing the viability of

interconnectedness and collaboration between suppliers in order to efficiently respond to demand and price fluctuations. A collaborative relationship between all players in the supply chain will give firms access to each other's operating capabilities (Nagarajan et al. 2013). There is evidence suggesting that volatility in the environment contributes to increased channel integration (Dwyer and Welsh, 1985). The consensus in the literature has been, for quite a while, that collaboration is effective at combating environmental uncertainty. Collaboration and flexibility go hand in hand for supply chains.

### *Supply chain collaboration and integration*

*1.4 Collaboration and information sharing.* "Competition in the future will be not be between competing enterprises but between competing supply chains" (Christopher, 1992). This statement highlights the paradigm that cooperating players which utilize the same supply network will benefit from each other's competencies. One way to achieve competitive advantage in fast-changing environments is to collaboratively share information (McCarthy and Golicic, 2002). Collaboration is essentially two or more members of the supply chain coordinating resources and sharing information to create a competitive advantage (Simatupang and Sridharan, 2002). Supply chain collaboration will be necessary for comprehending the uncertainties and increasing demand of India's changing consumer markets (Jain and Benyoucef, 2014). Furthermore, information sharing is key to collaboration and successful buyer/supplier relationships are connected with high levels of information sharing (Lee and Whang, 2000). Collaborative practices are positively associated with operational performance, especially across inventory management, order fulfillment, and demand responsiveness metrics. Forming cooperative networks may also offset the increased competitive pressure of new entrants into India's open and globalizing economy (Anbanandam et al. 2011). Information sharing and

collaboration deeply affects the supply chain to maximize profitability and connect the various stages of the chain to coordinate and schedule activities (Sahay and Mohan 2013). Leveraging SCM collaboration to increase scalability and resource sharing will make smaller firms more competitive against increased competition. A study of BMI's operational success by Kapoor and Ellinger (2004) realized that Indian firms should transform the traditional vertically-integrated system with unsynchronized processes and minimal information sharing to one that is horizontally-integrated and collaborative across the value chain with strategic partners. This essential strategy, in the context of uncertainty, will be hugely significant in responding to India's surging demand.

*1.5 More collaboration via strategic partnerships.* Nagarajan et al (2013) conducted a study of Indian manufacturing firms to explore how partnerships with logistics providers, through improved information quality, affected supply chain flexibility in response to uncertainty. The results showed that companies depend on their logistics partners to enhance flexibility and that information quality had a directly positive affect with flexibility. Coordinated exchanged of detailed information between trading partners impacts the cost and service level of the supply chain (Zhao and Hang, 2002). According to Sahay and Mohan (2003), capturing market share through efficient order fulfillment can be achieved with the aid of strategic partnerships along the interconnected supply chain: "It calls for Indian organizations to collaborate with supply chain partners in product design, product development, logistics, warehousing, and market reach." One key area is effective management of buyer/supplier relationships through strategic partnership and coordination of information (Jain and Benyoucef, 2008). Information organization and flow is a crucial component of an effective supply chain and increases profitability, improves responsiveness, and reduces waste (Chopra and Meindl, 2001).

In another study of a logistics alliance between Motorola and UPS, advantages were realized by both partners through lead-time reduction and cost savings. Improved information availability, reduced communication requirements, reduced warehousing needs, and improved volume consolidation were conferred benefits. Notably, strategic regionalization of warehousing to serve target customers was a key strategy, along with centralizing of inventories and consolidation of distribution routes (Bhatnagar and Viswanathan, 2000).

*1.6 Integrated IT systems and information sharing.* There is a positive relationship between integrated IT systems and supply chain integration (Vickery et al. 2003). IT is the key enabler for aligning business to consumer demand and achieving breakthroughs in supply chain design and planning (Sahay et al. 2003). IT spending has been relatively low in India with an overall average of 1.3 percent of gross sales versus a global average of 4.3 percent (Sahay and Mohan, 2003). Of the respondents surveyed by Sahay et al. (2006) less than 20 percent used IT applications for SCM, warehouse management, and demand management. But substantial increases in IT spending are projected for many organizations in the near future. Unfortunately, there is a dearth of recent studies tracking the rate of IT adoption by Indian firms. It is presumed that IT adoption for SCM is still on the rise and becoming more cost effective. A large proportion of Indian firms who have implemented IT solutions (though still a minority) prefer stand-alone options for ERP, instead of widely-used integrated SCM software such as SAP and Oracle. Competitive advantage can be achieved by supply chain networks that share efficient information via integrative IT. Integrated IT systems synchronize the production process by uniting functional components, such as strategic sourcing, with detailed information flow. Being able to synchronize production and delivery process between suppliers is crucial (Hines, 1994). In order to achieve this goal, Indian firms are reengineering their supply chain networks to

implement IT solutions for SCM. These solutions show favorability towards strategic partnerships, facility network planning, barcoding, and freight cost management to name a few. Collaborating with strategic partners to reduce demand volatility will be essential in enhancing service levels. Improving demand forecasting means utilizing integrated IT systems across all functional departments to compile daily data, create weekly forecasts, and share this information across the supply chain. More research on the current state of IT adoption by Indian firms is recommended.

*1.7 Streamlining the agricultural food chain.* SCM collaboration may be hugely beneficial in the Indian agricultural sector, an area steeped in old practices. The importance to any national economy of improving the efficiency of the agricultural food chain is essential (Beer, 2001). In India, an overwhelming proportion of food is sold in unorganized markets with negligible accounting. Estimates of food wastage are as high as 20 percent and farmers are known to destroy up to 30 percent of post-harvest crops for lack of cost-efficient demand and distribution (Economic Times Intelligence Group, 2003). Transaction costs increase significantly throughout the food chain before reaching the consumer due to many intermediaries, handling points, and long transit times. Value is not necessarily added at every stage. Agricultural prices may have risen up to 60 percent due to fragmented distribution and intermediaries (Ruben, 2007). The idea of managing this increased transactional cost has been exemplified by Sachan et al. (2005). In a given region there are numerous individual farmers who possess small economies of scale. They are limited by their production capacity, knowledge of distribution options, and are subject to powerfully organized groups of commission agents, wholesalers, and traders etc. These intermediary relationships exist across India's rural landscape. The number of intermediaries, namely commission agents, and their respective networks is immeasurable -

constituting a highly complex supply chain network that is difficult to manage. The commission agents assist in matching supply to demand, along with traders, consolidators, and wholesalers. But the sheer multiplicity of these middlemen drive up total supply chain cost. The prime source of the supply, the individual farmers, are left mostly disjointed from the system. This point of origin is where SCM collaboration may begin to effectively manage the complexity and minimize total supply chain cost. Supply chains can be set up to improve the scale and quality of product by acting as a third-party management system that replaces the roles of several intermediaries. The produce can be collected, consolidated, stored, and cross-docked by the third-party supply chain agent. Also, farmers can form cooperatives to increase efficiency in the upstream phases of the food chain. These cooperative arrangements can perform the key supply chain activities of procurement, storage, processing, and marketing. The need for multiple commission agents and other individual intermediaries may be removed. These collaborative SCM strategies have been modeled and shown to reduce wastage and markup costs for intermediaries by up to 50 percent (Sachan et al. 2005). Reorganizing the rural food chain is an opportunistic example of utilizing a collaborative SCM framework to reduce total cost through efficiency and accountability.

## **Infrastructure and distribution in a dynamic environment**

### *Optimizing distribution channels and mass market (rural) penetration*

*2.1 Rural distribution channels.* Integrating India's rural supply network is a challenge. About three-fourths of the Indian population is rural and represents the largest market segment. With rising income levels, this sector's consumption rate is projected to grow much faster than the urbanized sector, especially for small-scale personal products. Reaching these markets and

developing rural distribution networks to access this diverse consumer base continues to be a key challenge. The biggest environmental barriers to deep penetration seem to be the sheer scope of the rural dispersion, its low density, and a lack of suitable transportation infrastructure (India has one of the world's largest road networks, but less than half are paved) (Aithal, 2012). The issue of numerous intermediaries is once again prevalent, as the current distribution structure is multi-tiered, and is designed to reach local village retailers through multiple wholesalers at the district and city-town level.

*2.2 Rural distribution channels continued.* Analysis performed by Aithal (2014) found that the length and structure of intermediaries within rural retail supply chains varies across regions based on environmental factors. The structure of rural distribution channels is also determined by the density of markets and buying preferences of individual consumers. Low density markets require small quantities of goods and small inventories. Consequently, more intermediaries will be used in these less dense markets. These two factors: the number of intermediaries spawning numerous local retailers and the granular size of business (small and individualized order sizes) have a significant influence on the structure of distribution (Bucklin et al. 1996). Alderson's concept of "discrepancy of assortments," discussed by Aithal (2014), states that the efficiency of indirect channels is positively associated with product assortment structure. More intermediaries are required to distribute more differentiated products. Also, firms that operate with economies of scale rely more on direct and integrated channels. Because rural and moderate-sized customers cannot be served by conventionally direct channels without increasing operating costs, a determinant of channel integration will be the average order size of individual customers (Frazier et al. 1989). These aforementioned factors describing the state of rural distribution channel structure lead Aithal (2014) to offer insight on the relational influence



between rural markets and distribution channel structure. Villager retailers at the bottom of the channel pyramid still prefer the semi-wholesalers found in the nearest small town, even more than the local village wholesaler or larger urban wholesaler/distributor. This is primarily because of improvement of roads and transportation services allowing villagers to seek out the greater individualized service provided by the semi-wholesaler. The semi-wholesaler is able to match the high frequency, low volume demand of surrounding villagers. The diminishing role of the village wholesaler confirms the reality that increases in the infrastructural development of regions lead buyers to bypass low-end intermediaries. Minimizing the cost to serve for rural retailers will present an opportunity to examine and improve distribution channels. Increased travel distance makes it more costly for rural inhabitants to source their needs. The intermediary supply channel lengthens as the cost of transportation increases. More developed population clusters called talukas exhibit a pattern of shorter channel length. And Aithal's study of multiple talukas found that distribution channels are uniquely configured with respect to a taluka's geographic environment and population density. However, individual village size had no correlation with channel length. Larger villages did not exhibit shorter and more direct channels, indicating that indirect purchasing via towns and talukas is still prevalent within the complex rural market. The "discrepancy of assortment" provided at the town/taluka level is still more attractive to rural individuals, but the high frequency buying pattern of rural inhabitants makes them dependent on these intermediaries.

*2.3 One size does not fit all.* The overarching idea is that a relationship exists between how distribution channels adapt to dynamic environments. The supply network reaching rural markets is often overlooked in lieu of more advanced and competitive systems found in the developed world. An understanding and appreciation of the needs of India's rural markets is

necessary. “One size does not fit all.” Microfinance is allowing scalable distribution systems to come into being and reach deeply into these rural markets. Improvements in financing will make larger purchases by rural individuals more sustainable. Companies developing extensive supply networks, or leveraging existing ones, will reduce channel fragmentation and better serve the rural market. Meanwhile, dedicated distribution networks will better serve a dynamic environment with limited infrastructure by catering to smaller order sizes – even by untraditional methods (e.g. motorcycle services for unpaved roads). Income is rising across India and redeveloping rural distribution channels through innovation provides a way to increase market penetration.

### *Third-party logistics (3PL)*

2.41 Distribution service providers are highly fragmented in India and the organizational logistics infrastructure needs improvement. Inadequate transport infrastructure, transit policies, and underdeveloped logistics operations increase the total cost of business. India spends 12 to 14 percent of GDP on logistics (mostly due to reliance on roads), so reducing logistics cost will be a challenging opportunity. The need for reliable 3PL providers will be huge in the coming decade as Indian organizations are forced to collaborate across core competencies. Supply chain flexibility is being enhanced by logistical efficiency (Omar et al. 2012). Increasing demand and shorter product lifecycles will require more reliable logistics. Many 3PL providers are being engaged to handle warehousing and transportation on a regional basis. Traditional multi-vendor models are being replaced by single providers to improve in-bound reliability and further reduce complexity. More complex supply chains are evolving across India’s many states and regions, that the expertise of logistics providers regarding environmental and institutional constraints is

becoming more valuable. For example, 3PL providers with embedded knowledge of tax structures are being utilized with multiple regional warehouses to optimize distribution networks.

2.42 Studies indicate that Indian organizations are improving logistics functions to increase sales, reduce order time, and minimize inventories (Sahay and Mohan, 2006). Improving customer satisfaction, delivery time, order fulfillment, and inventory management are surveyed to be highly prioritized metrics implemented in Indian firms' SCM strategies (Sahay and Mohan, 2003). Investment in logistics development will be important as these SCM performance metrics become more aligned with overall core strategies. Logistics functions are increasingly being outsourced to experts within the field to improve SCM performance so that Indian firms can focus on their core competencies. The literature suggests that improvement of SCM performance and customer satisfaction is stimulating the trend of increasing reliance on 3PL providers by Indian firms. Most organizations who currently use third parties are satisfied and plan to expand functional usage. Significant increases in logistics outsourcing is planned for the next few years, but there is still an insufficient provision of organized logistics. About 55 percent of surveyed companies utilize third party logistics (Sahay and Mohan, 2006). Still, India's transportation industry remains fragmented.

## **Institutional Concerns**

### *An overview of economic reforms, tax structure, and implications*

3.1 *Tax structure and economic reforms.* Since 1991, central indirect taxes have been reduced in favor of value-added tax (VAT). More incentives have been provided for the infrastructure and export sectors, including developing special economic zones and reducing direct rates for corporations. These goals were designed to provide macro-economic stability as

India becomes more globally connected (Pillarisetti, 1995). However, the rationalization of the Indian tax system is an ongoing process and major reforms have taken place in the last decade. The most relevant taxes for this discussion are the indirect taxes: VAT (value-added tax), GST (goods and services tax), CST (central sales tax), entry taxes, and excise duties (levied on manufactured goods). The basic tax structure is as follows:

- importer/supplier → *customs duties & entry tax* → manufacturer
- manufacturer → *excise duties* → distribution center
- distribution center → *VAT/CST/entry tax* → cities & hubs

The VAT is a multi-stage intrastate tax on the various stages of production and supply, with credit given for tax paid at each stage. The VAT structure is as follows (Income Tax Department, 2014):

- 12.5% – standard rate (varies across states)
- 0.8% – steel, iron, IT products, industrial inputs, and some processed foods
- 0% – exports
- N/A (exempt) – textiles, most grains, and business involving turnovers of Rs. 500,000 or less

As of 2010, the Indian government is planning to make VAT uniform across states in order to replace it with GST. The central sales tax (CST) is applicable to interstate sales of goods. It is capped at 3 percent and is gradually being phased out in favor of GST/VAT as of 2010 (implications will be discussed). As of 2005, the VAT has replaced sales tax on movable goods in most states. As of 2007, excise duty reforms include reduced rates on ready-to-eat packaged foods, iron, exports, and other selected items. Full exemption of customs and excise duties are

allowed for commercial aircrafts and parts (CBEC 2014). Special economic zones (SEZ) were established in 2005 to attract FDI and offset the disadvantages of a complex tax structure, excessive procedural controls on conducting business, and a lack of world-class infrastructure. The SEZ's were designed to create employment, stimulate export, promote investment, and develop infrastructure. SEZ's provide exemption on import/export duties, CST, and other taxes (SEZ in India 2014).

*3.2 Implications.* It is notable that recent tax incentives have been designed for investment in infrastructure, food processing, handling of food grains, and production of mineral oil (Income Tax Department, 2014). These are sectors where logistics and SCM play necessary roles. Ongoing economic reforms and privatization in India are creating significant increases in demand and trade. These changes include the liberalization of FDI regulations and policies controlling foreign exchange, licensing, and import/export trade (Pillarisetti, 1995). Supply chains must be flexible as these regulatory issues change. Also, supply chain and logistics optimization is required to capitalize on the tax structure of excise duties and VAT. Double taxation by federal and state governments make the cost of goods high. The manufacturing footprint of firms will need adjustment by relocating production and warehousing to capitalize on regional exemptions and rates. The location strategy of firms must take into account special economic zones and focus on taking advantage of tax benefits and incentives. Designing a supply network requires location modeling based on geographic factors and the layered VAT/CST variations for transportation and warehousing. Optimizing the network layout is needed to factor excise duties and taxes into total production costs. However, as gradual reforms take place to unify VAT and replace CST, optimizing location strategies will be less impactful than before. For example, a removal of CST would benefit the centralization of warehousing and

distribution. And a uniform VAT structure would simplify optimization models. More research should be done on current tax reform and its effect on location modeling.

## **Research gaps**

### *Integrating end-user marketing with SCM*

4.1 The notion of relationally focused SCM integration is increasingly important in the realm of marketing. In this regard, the field of SCM is expanding to include larger and more complex value chains collaborating around market channels that target specific customers. Rural segments are of particular interest. Marketing management, channels, and orientations may be enveloped within the SCM framework in order to synchronize the management perspective (Sandhu, 2012). The growing overlap between SCM and marketing concepts, and the need to satisfy end-user requirements, is a fruitful topic of exploration (Gundlach et al. 2006).

### *Cold chain development*

4.2 India's cold chain industry is very promising due to growing retail and food processing industries, rising agricultural output, and rising food consumption. This growth should be attractive to domestic and international entrants. But the cold chain market in India remains largely unorganized. Entrepreneurial and operational development in this area should be aided by further independent research to assist managerial decisions. More work is needed to identify cold chain inhibitors and apply them to a practical framework. Also, more statistical validation of current relationship models of cold chain performance is suggested (Joshi et al. 2009).

### *Reverse logistics*

4.3 The reverse logistics industry in India should expect high growth if government regulations start favoring waste management and infrastructure development. There will be a complementary need for reverse logistics as the transportation and forward logistics industries become more organized and profitable. Perhaps more study is needed on how reverse logistics can bridge the gap between manufacturers and end-users to increase profitability. As Abraham (2011) suggests, further study of the costs associated with each stage in the reverse logistics process would be useful.

### *Cross-cultural logistics*

4.4 The globalized era has made intercultural business common, yet there is a lack of comparative SCM research between developing and developed countries (Awais et al. 2014). Cross-cultural logistics provides a multidisciplinary area of study linking logistics and cross-cultural studies. India is becoming more attractive to business and international trade is becoming more interdependent. Therefore, it seems natural to promote sensitivity training and understanding of cultural differences among logistics managers. SCM is viewed as significant to organizational success in a dynamic business environment such as India. New entrants seeking to conduct business and form strategic relationships need to understand the norms associated with India's cultural identity.

## **Conclusion**

5.1 *Conclusion.* Strategic SCM enhances the firm's ability to maintain a competitive advantage in a dynamic business environment. India's international trade is more global and its internal markets are growing in complexity. Thus, supply chains are being extended and managed over longer distances. Reforming traditional vertically-integrated processes into more

horizontally-integrated and synchronized networks is advisable. However, managers need to be weary as overextension will increase complexity and uncertainty across the value chain.

Outsourcing non-core competencies and collaborating with strategic partners will benefit all players in an increasingly competitive environment. Distribution networks need to penetrate deeper markets more effectively. They need to adapt to specific regions, while reducing channel fragmentation and transaction costs. More demanding consumers are requiring more accurate demand planning and better overall service levels. Building flexibility into supply chains is important for industries where demand forecasting is difficult, supplier relationships are fragmented and information flow is inconsistent. Underpinning demand-driven supply chains are the needs for integrated IT systems and more efficient information sharing. Ultimately, aligning SCM strategy with overall business strategy will improve customer satisfaction, operational performance, and profit maximization. Firms optimizing their supply chains by aforementioned suggestions will benefit from India's huge growth potential for years to come.

## References

- Abraham, Nandita (2011), "The apparel aftermarket in India – a case study focusing on reverse logistics", *Journal of Fashion Marketing and Management: An International Journal*, Vol. 15 Iss 2 pp. 211–227.
- Aithal, Rajesh K. (2012), "Marketing channel length in rural India", *International Journal of Retail & Distribution Management*, Vol. 40 Iss 3 pp. 200–217.
- Anbanandam, R., Banwet, D.K., and Shankar, Ravi (2011), "Evaluation of supply chain collaboration: a case of apparel retail industry in India", *International Journal of Productivity and Performance Management*, Vol. 60 Iss 2 pp. 82–98.
- Awais, Syed, Tipu, Ahmad and Fantazy, Kamel A (2014), "Supply chain strategy, flexibility, and performance", *The International Journal of Logistics Management*, Vol. 25 Iss 2 pp. 399 – 416.
- Beamon, B.M. (1999), "Measuring Supply Chain Performance," *International Operations and Production Management*, Vol. 19 Iss 3 pp. 275–292.



- Beer, S. "Food and Society", *Food Supply Chain Management – Issues for the Hospitality and Retail Sectors*, Routledge, 2001. Print.
- Bhatnagar, Rohit and Viswanathan, S. (2000), "Re-engineering global supply chains", *International Journal of Physical Distribution & Logistics Management*, Vol. 30 Iss 1 pp. 13–34.
- Bucklin, L., Ramaswamy, V. and Majumdar, S. (1996), "Analyzing channel structures of business markets via the structure-output paradigm", *International Journal of Research in Marketing*, Vol. 13 No. 1, pp. 73-87.
- CBEC (2014), *Central Board of Excise and Customs. Department of Revenue. Ministry of Finance*. Web. Retrieved from <<http://cbec.gov.in>>
- Christopher, M., *Logistics & Supply Chain Management: Strategies for Reducing Costs and Improving Services*, London: Financial Times/Pitman Publishing, 1992. Print.
- Christopher, Martin and Holweg, Matthias (2011), "Supply Chain 2.0": managing supply chains in the era of turbulence", *International Journal of Physical Distribution & Logistics Management*, Vol. 41 Iss 1 pp. 63–82.
- Chopra, M. and Meindl, P. (2001), *Supply Chain Management: Strategy Planning and Operation*, 1st Indian reprint, *Pearson Education Asia*, New Delhi.
- Coleman, G. (2007), "Leveraging emerging markets for commercial success", *Business Strategy Series*, Vol. 8 Iss 2 pp. 102–108.
- Cuervo-Cazurra, A., Maloney, M., and Manrakhan, S (2007), "Causes of the difficulties in internationalization", *Journal of International Business Studies*, Vol. 38 Iss 5 pp. 709–725.
- Dwyer, R. and Welsh, A. (1985), "Environmental relationships of the internal political economy of marketing channels", *Journal of Marketing Research*, Vol. 22 No. 4, pp. 397–414.
- Economic Times Intelligence Group (2003), "Changing Gears: Retailing in India, Economic Times Knowledge Series", *Economic Times Intelligence Group*, Mumbai.
- EIA (2014), *Independent Statistics and Analysis. U.S. Energy Information Administration*. Web. Retrieved from <[www.eia.gov](http://www.eia.gov)>
- Frazier, G., Gill, J. and Sudhir, H.K. (1989), "Dealer dependence levels and reciprocal actions in a channel of distribution in a developing country", *Journal of Marketing*, Vol. 53 No. 1, pp. 50-69.
- Gundlach, Gregory T., Bolumole, Yemisi A, Eltantawy, Reham A., and Frankel, Robert (2006), "The changing landscape of supply chain management, marketing channels of distribution, logistics and purchasing", *Journal of Business & Industrial Marketing*, Vol. 21 Iss 7 pp. 428–438.
- Hines, Peter. *Creating World Class Suppliers*, London: Pitmans, 1994. Print.
- Income Tax Department (2014), *Income Tax Department. Government of India*. Web. Retrieved from <<http://www.incometaxindia.gov.in>>

- Jain, Vipul and Benyoucef, Lyes (2008), "Managing long supply chain networks: some emerging issues and challenges", *Journal of Manufacturing Technology Management*, Vol. 19 Iss 4 pp. 469–496.
- Joshi, Rohit, Kumar, Devinder Banwet, and Shankar, Ravi (2009), "Indian cold chain: modeling the inhibitors", *British Food Journal*, Vol. 111 Iss 11 pp. 1260–1283.
- Kaipio, H. and Leppänen, S. (2005), "Distribution Systems of the Food Sector in Russia: the Perspective of Finnish Food Industry", *Publications of Helsinki School of Economics*, B–61.
- Kapoor, Vivek and Ellinger, Alexander E. (2004), "Transforming supply chain operations in response to economic reform: the case of a motorcycle manufacturer in India", *Supply Chain Management: An International Journal*, Vol. 9 Iss 1 pp. 16 – 22.
- Khan, Arif, Rajesh, K., and Pillania, K. (2008), "Strategic sourcing for supply chain agility and firms' performance", *Management Decision*, Vol. 46 Iss 10 pp. 1508–1530.
- Kharas (2011), "The emerging middle class in developing countries", *Brookings Institute. World Bank Conference*.
- Lee, H.L. and Whang, S. (2000), "Information sharing in a supply chain", *International Journal of Technology Management*, Vol. 20, pp. 373–83.
- Lee, H.L., Padmanabhan, V. and Whang, S. (1997), "Information distortion in a supply chain: the bullwhip effect", *Management Science*, Vol. 43 Iss 4, pp. 546-5.
- McCarthy, Teresa M. and Golicic, Susan L. (2002) "Implementing collaborative forecasting to improve supply chain performance", *International Journal of Physical Distribution & Logistics Management*, Vol. 32 Iss: 6, pp.431 – 454.
- McKinsey (2007), "The 'Bird of Gold': The Rise of Indian Consumer Market", *McKinsey Global Institute*, USA.
- Nagarajan, Vivek, Savitskie, Katrina, Ranganathan Sampathkumar, Sen, Sandipan, and Alexandrov, Aliosha (2013), "The effect of environmental uncertainty, information quality, and collaborative logistics on supply chain flexibility of small manufacturing firms in India", *Asia Pacific Journal of Marketing and Logistics*, Vol. 25 Iss 5 pp. 784–802.
- Omar, A., Davis-Sramek, B., Myers, M.B. and Mentzer, J.T. (2012), "A global analysis of orientation, coordination, and flexibility in supply chains", *Journal of Business Logistics*, Vol. 33 No. 2, pp. 128–144.
- Pillarisetti, J. Ram (1995), "Direct tax reform in privatizing economies", *International Journal of Social Economics*, Vol. 22 Iss 8 pp. 22 – 33.
- Prater, Edmund, Biehl, Markus, and Smith, Michael Alan (2001), "International supply chain agility # Tradeoffs between flexibility and uncertainty", *International Journal of Operations & Production Management*, Vol. 21 Iss 5/6 pp. 823–839.

- Rahman, Zillur and Bhattacharyya, S.K. (2003), "Sources of first mover advantages in emerging markets – an Indian perspective", *European Business Review*, Vol. 15 Iss 6 pp. 359–369.
- Ruben, R. (2007), "Vegetables procurement by Asian supermarkets: a transaction cost approach", *Supply Chain Management: An International Journal*, Vol. 12 No. 1, pp. 60–8.
- Sachan, Amit, Sahay, B.S., and Sharma, Dinesh (2005), "Developing Indian grain supply chain cost model: a system dynamics approach", *International Journal of Productivity and Performance Management*, Vol. 54 Iss 3 pp. 187–205.
- Sahay, B.S., and Mohan, Ramneesh (2003), "Supply chain management practices in Indian industry", *International Journal of Physical Distribution & Logistics Management*, Vol. 33 Iss 7 pp. 582–606
- Sahay, B.S., Gupta, N.D. Jatinder, and Mohan, Ramneesh (2006), "Managing supply chains for competitiveness: the Indian scenario", *Supply Chain Management: An International Journal*, Vol. 11 Iss 1 pp. 15–24.
- Sahay, B.S. and Mohan, Ramneesh (2006), "3PL practices: an Indian perspective", *International Journal of Physical Distribution & Logistics Management*, Vol. 36 Iss 9 pp. 666–689.
- Sahay, B.S., Cavale, Vasant, Mohan, Ramneesh (2003), "The "Indian" supply chain architecture", *Supply Chain Management: An International Journal*, Vol. 8 Iss 2 pp. 93–106.
- Sandhu, Harpreet Kaur (2012), "Emerging trends in rural marketing", *International Journal of Marketing, Financial Services & Management Research*, Vol. 1 Iss 4 pp. 95-99.
- SEZ in India (2014), *Special Economic Zones in India. Ministry of Commerce & Industry. Department of Commerce*. Web. Retrieved from <<http://www.sezindia.nic.in>>
- Simatupang, T.M. and Sridharan, R. (2002), "The collaborative supply chain", *International Journal of Logistics Management*, Vol. 13, pp. 15–30.
- Thakkar, Jitesh, Kanda, Arun, and Deshmukh, S.G. (2012), "Supply chain issues in Indian manufacturing SMEs: insights from six case studies", *Journal of Manufacturing Technology Management*, Vol. 23 Iss 5 pp. 634–664.
- Vickery, S., Calantone, R. and Droge, C. (1999), "Supply chain flexibility: an empirical study", *The Journal of Supply Chain Management*, Vol. 35 No. 3, pp. 16–24.
- Vickery, S., Jayanth, J., Droge, C. and Calantone, R. (2003), "The effects of an integrative supply chain strategy on customer service and financial performance: an analysis of direct vs indirect relationships", *Journal of Operations Management*, Vol. 21 No. 5, pp. 523-539.
- Zhao, X., Xie, J. and Hang, W.J. (2002), "The impact of information sharing and ordering co-ordination on supply chain performance", *Supply Chain Management: An International Journal*, Vol. 7 No. 1, pp. 24–40.