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Demand and Supply Chain Integration
Strategy for Emerging Market

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Demand and Supply Chain Integration Strategy for Emerging Market

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Abstract: In this article, we discuss the challenges for global supply chain in emerging markets. We also present a research model of demand and supply chain integration system (DSCIS) which responds to customer's needs through the integrated information flows. DSCIS synchronizes the key processes in terms of frontend development, product planning, product design, procurement, manufacturing, sales and marketing, maintenance activities based on customer needs as process routines. We further explore the following research questions: (1) what SCM practices do firms consider for emerging market? (2) In the context of emerging market, how are these SCM practices implemented?

This paper examines the SCM practices of electronic firms and auto-manufacturers that operate in China. What is noted in this study is that those firms that implement the deeper level of localization experience huge business successes. It is imperative for any global firms to (1) understand the rapidly changing market reality (2) develop partnership with the local governments for achieving effective market penetration. The scope of outsourcing is extended to the local firms that are strategically aligned to assume specific aspects of global supply chain management challenges. In brief, integration of both supply and demand chain is crucial for emerging market markets.

Key Words: Supply Chain Management, Emerging Markets, Demand Chain, demand and supply chain integration system (DSCIS)

1. Introduction

In times of stiff global competition, firms construct supply chain that allows customers to supply their products and services timely. Their practical challenges are how to integrate both internal and external supply chain. Increasingly, customers consider not only functionality, quality and prices of the products but harmony of their lifestyle as their basic purchasing criteria (Park et al., 2012). Final customers expect the total packages of a product to be compatible with their value systems and life styles. Thus customer's purchasing decisions are based on the harmonious integration of product functional requirements and customer cultural value expectations.

This article aims to discuss the challenges for global supply chain in emerging markets and present a research model of demand and supply chain integration system (DSCIS). Based on extant literature review the model specifies the changing supply chain management practices for emerging market. DSCIS synchronizes the key processes in terms of frontend development, product planning, product design, procurement, manufacturing, sales and marketing, maintenance activities based on customer needs as process routines. We further explore the following research questions: (1) what SCM practices do firms consider for emerging market? (2) In the context of emerging market, how are these SCM practices implemented?

For meaningful examination of these research questions, we employ case studies in the context of China. Firms that participate in the case studies are carefully chosen to study both internal and external supply chain practices to meet the complex customer requirements. Case findings suggest that successful global firms make their strategic focus beyond supply chain and then move toward demand chain in the emerging market.

2. Literature Review

2.1 Supply Chain Management and Business Performance

First of all, let us consider supply chain management (SCM) from the business

Demand and Supply Chain Integration Strategy for Emerging Market

performance perspective. SCM intends to maximize customer satisfaction while minimizing total costs of all the activities from securing raw materials to delivering products and services to final customers (Lambert and Cooper, 2000; Vicker et al., 2003). To integrate all these activities to firms' competitiveness requires reconfiguring all the internal and external processes from the perspective of global optimization (Frohlich and Westbrook, 2001; Zhou and Benton, 2007). Thus, SCM is to approach all the intra- and inter-business processes as a unified and integrative business process for the purpose of enhancing total value added and sharing the total benefits among the supply chain partners. From the logistics standpoint, SCM is to reduce any forms of wastes related to new product development time, procurement and manufacturing costs, distribution and sales. This is to provide customers the right products at the right time at the right prices while reducing the overall inventory level low and minimizing lead times, and maximizing the utilization of facilities and equipments. Thus, the common aspects of SCM are to (1) satisfy customers (2) achieve global optimization.

2.2 Supply Chain Management in Emerging Markets

This section is devoted to discuss SCM topics in Emerging Markets which include (1) integration between demand chain and supply chain, (2) product/service development fitting emerging markets, (3) differentiation of supply management style and inventory management, (4) consideration of marketing channels, (5) logistics strategy different from advanced markets, (6) strategy considering local government policy and institutional rules such as FTA and TPP.

Supply chain management considers all the information exchange and the movement of goods from manufacturer, wholesaler, and retailer to all the suppliers on the extended supply chain (Zhou and Benton, 2007). To successfully meet all the requirements of customers, SCM applies total system in managing information, materials, and services (Chase, 1998; Sahin and Robinson, 2002; Li and Wang, 2007; Zhou and Benton, 2007; Park and Hong, 2012).

It is possible for focal firms to reduce their innovation expenditures and minimize

risk factors through collaboration with the partners in a business-ecosystem (e. g., suppliers with unique technological and manufacturing capability even in other countries). What is critical for competitive advantage is how such focal firms seek, find and involve these resourceful and competent suppliers in their network. They must combine knowledge assets of many suppliers in its network. Thus, integrating ability of a focal firm is quite important in any network (Brusoni and Prencipe, 2001).

However, it is not sufficient to simply bring in such suppliers into a network and integrating them as network members. Instead, sustainable competitive advantage requires perpetual network coordinating capability. In this sense, coordinating mechanisms of Japanese automobile manufactures (e. g., encouraging competition among suppliers while promoting long term trust relationships) have contributed to the formation of successful network (Asnuma, 1997). Li and Wang (2007) focus on coordination mechanisms that influence on the goals of supply chain member. An effective value chain management requires managing incentives within supply chain (Narayanan and Raman, 2006). Sahin and Robinson (2002) also discuss the value of information and physical flow coordination.

In this paper, we present SCM issues in emerging markets. Merely selling products to customers is no longer adequate in satisfying the growing demand of customers. Instead, firms strive to plan integrative supply chain strategy that includes product concept planning, product development and commercialization and after-services. These firms focus on establishing global supply chains to stay competitive. Increasingly, these global firms not only move their manufacturing facilities but also their marketing/ sales and distribution functions. These firms implement integrative supply chain management that synchronizes both internal and external business practices. SCM consider inter-organizational network management that is far beyond organizational specific practices. Firms no longer approach their product flows in terms of their own product brand. Rather, they look into more deeply on examining all the supply chain partners and move forward demand chain in the global markets-particularly emerging markets (Scannel, et al., 2000). Such changing market reality requires building network capabilities that respond to the diverse customers

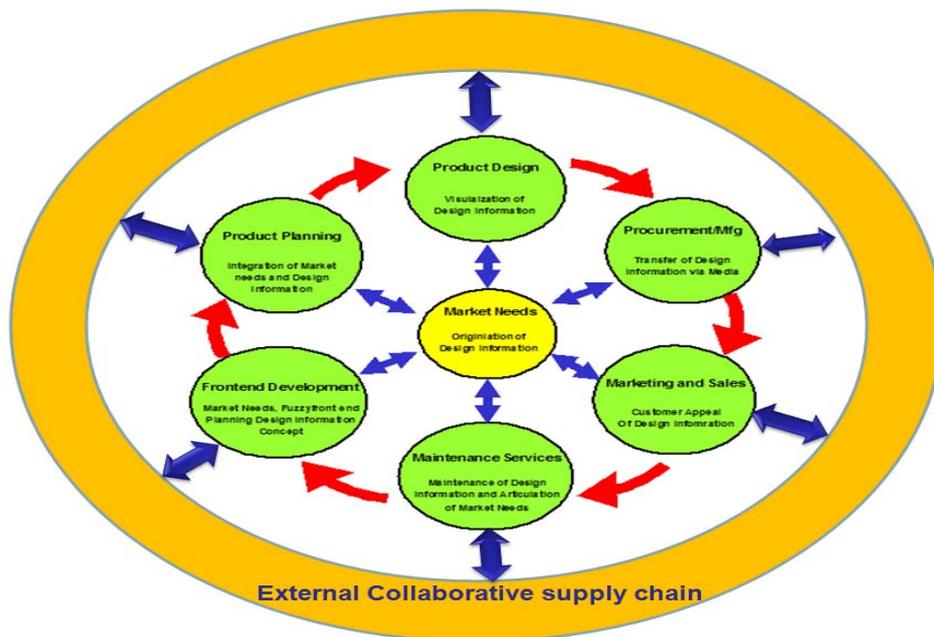
Demand and Supply Chain Integration Strategy for Emerging Market

demands from global market (Korhonen et al., 1998; Demeter et al., 2006; Crook and Combs, 2007).

2.3 Research Framework

Figure 1 shows demand and supply chain integration model (DSCIM) based on streams of customer needs.

Figure 1. Demand and supply chain integration model (DSCIM)



It responds to not only the known existing needs but also hidden needs (new customer requirements) through foresight planning of design information (Park et al., 2011; Park and Hong, 2012). It also identifies the key processes in terms of: (1) frontend development deriving product concept; (2) product planning integrating customer needs—expressed or unspoken—and design information; (3) product design visualizing design information; (4) procurement and manufacturing transferring design information through media choices; (5) sales and marketing appealing customers by design information; (6) maintenance activities managing design information as process routines. Demand and supply chain integration model (DSCIM) needs to be linked with external related supply chain.

3. Case Study

A crucial aspect of supply chain management is to share information beyond the firm boundaries. Thus, careful selection of suppliers and strategic partners is very important. Careless bonding with the unfit partners has serious business implications. Too often firms experience business failures instead of competitive advantage through supply chain management. In this section, we focus on how Apple Inc. and Sony integrate their supply chains with Foxconn in China.

Apple and Sony maintain their core competences within. Yet, they pursue supply chain integration in the other business areas that requires supplier collaboration. These two firms maintain strategic alliance with Foxconn which is a leading firm in the global electronics manufacturing services (EMS). In general, manufacturing firms establish strategic alliance with EMS firms for three reasons: (1) production side—prepare for changing requirements of mass production or demand fluctuations, (2) cost side: attain cost advantage through reducing maintenance expenses, administrative and inventory costs. (3) global production responsiveness—choose production locations close to the customers. Thus, EMS plays an important role for effective supply chain management in emerging markets.

3.1. Electronic Industry Case: Apple and Sony in China

3.1.1. Apple and Foxconn

Apple Inc., which has maintained No.1 position in achieving supply chain effectiveness according to AMR Review from 2008–2010, has collaborative with Foxconn, a leading EMS firm. The market share of Apple Inc., the number one customer of Foxconn, is 16% in China. Apple uses Foxconn to open a new market segment in any of the Chinese deep interior regions and thus achieve very effective logistical configurations in the long term. Apple has fascinated the global customers through its innovative product design and features (e.g., iPhone and iPad). However, these advantages do not guarantee

Demand and Supply Chain Integration Strategy for Emerging Market

sustainable competitiveness in the environment of rapidly changing customer requirements. The success factors of Apple include more than refreshing design and innovative features. Rather, Apple's supply chain management provides its crucial competitive advantage in the market (Nikkei, 2012).

Apple does not maintain any manufacturing plants of iPhones in USA. Apple's manufacturing strategy is through outsourcing, not having its own manufacturing facilities (i.e., fables methods). The merit of fables methods is to avoid risks related to capital investment and maintenance costs for massive manufacturing facilities. Instead, the strategic focus is in its design/development/marketing/distribution. Thus, speedy management is quite possible with such arrangements. Fables approach requires careful selection of strategic partners for global SCM.

Apple entrusts production to Foxconn, a Taiwan-based EMS, for several reasons. First of all, it is needed to mention that in addition to low labor costs in China than in USA, component parts of iPhones are mostly concentrated in Asia. According to component parts list by Apple, more than 70% of all component parts are procured in Asian countries including Japan and Korea. From the logistics standpoint, it is sensible to utilize Foxconn in China from effective management of SCM that covers all the business processes from procurement of component parts to manufacturing and final assembly. In this way, collaboration between Apple and suppliers achieves maximum benefits of global SCM by combining its strong product concept/design planning and marketing/distribution network along with Foxconn's procurement and production capabilities.

Disadvantages of fables approach are worthy to mention here as well. Since Apple does not involve in the entire production process control, series of issues may arise in the form of inadequate inventory management, increasing surplus of certain component parts, and long-term fixation of specific lead time for manufacturing and logistics. However, Apple proactively handles these potential problems. Apple applies product lifecycle management (PLC) which ensures minimum inventory in the

final manufacturing assembly and distribution process. Thus, with such tight inventory control system the prevailing perception of consumers is that when the current models have no more stocks to sell, Apple soon introduces new product models. Apple distributes its products through direct sales by Apple Stores. Apple implements SCM through direct sales to its products to the customers and consistent after-sales services. By using only limited distribution channels Apple maintains its product brand image to the loyal customers. Through Apple Stores customers experience superb after sales services and gain access to exclusive product related information, Apple also monitors the precise level of inventory of its product lines and manages the overall inventory management through advance production planning.

Competitive advantage in emerging markets requires effective demand management. Apple listens to the customers and uses their feedback to the better development of new products. The information and knowledge gap between Apple and its customers is reduced through show rooms in the direct sales network. Apples' 357 stores worldwide (as of September 2011) generate \$14.1 billions in sales (13% of total sales of \$108.2 billions). Average sales per store are \$43.3 millions. This is 49 times of that of Unicorn, a leasing retail outlet in Japan (Nikkei Newspaper, 2011). Thus, Apple plans to increase the size of distribution channel in Hong Kong and Mainland China from the current level of six (2011) to twenty five in the following years (Nikkei Industrial Newspaper, 2011). In this way, Apple reaps the benefits of fables production through Foxconn and effective product design and rich customer contacts through direct sales outlets and effective marketing/distribution channels.

3.1.2. Sony and Foxconn

Sony is a Japan' s leading electronic firm. Sony targets the global markets with its diverse products including TV, PC, and video games. Sony, in spite of poor negative profit performance in 2011, has recently shown remarkable innovation in its supply chain management practices.

This section focuses on Sony' s production and marketing practices. Sony has

Demand and Supply Chain Integration Strategy for Emerging Market

developed cell production methods (CPM) which is an improvement of Toyota's Kanban methods. For CPM one or several workers take care of the entire processes starting from components selection, manufacturing assembly, inspection and product release (i.e., cross-disciplined and multi-task trained workers method). The production process involves U-shaped cells that handle all the component parts necessary for the specific process sequences. CPM is quite effective for small scale production for customized diverse product features. Production volume control and labor requirements are fairly easy with this method.

Sony has seven factories in China and the total number of employees is 48,000 (As of 2010). Sony is different from Apple in that it maintains its own manufacturing facilities in China. However, it is worthy to consider if such Sony's CPM (directly imported from Japan) is quite fitting to the large and rapidly growing Chinese market. It seems that Apple's EMS through Foxconn might be better meet the Chinese market requirements through mass economies of scale production and extensive application of automation in manufacturing processes.

Recently, Sony is building up network capabilities in view of growing volume demand in Chinese market. Sony set the sales target for LCD TV (2 millions) and video games (4 millions) in 2010. Sony also established strategic alliance with Foxconn for greater manufacturing and logistics capabilities. Such strategic move is based on the prediction that China would be the world's largest LCD TV market in 2011. Thus, Sony's SCM integrates the upstream processes (i.e., product design and development and brand management by Sony) and downstream processes (i.e., manufacturing and logistics by Foxconn), and attain cost reductions in production and logistics processes.

Sony cancelled the joint venture agreements with Korean Samsung and sold off TV assembly plants and downsized its overall manufacturing production network. Sony is negotiating with High Sense, Chinese large household electronics firm, for production and distribution network configurations (Sankkei Newspaper, 2012). This is Sony's response to Chinese government's policy directive of household electronics goods distribution in rural areas. Sony's strategic intent is to strategic alliance with

Chinese firms for rapidly expanding China's huge interior market. In China Sony sells its products through Vaio Shop which is Sony's direct distribution outlet managed by third party distributor approved by Sony. For Vaio Shop, Sony's motto is, "Deliver to the extent what is sold". Sony determines the safety stock level and delivers to the extent of sales recorded by each individual Vaio Shop on regular basis. Sony sells 70% of Vaio (PC) and 50% of digital cameras in Vaio Shops in China. Thus, Sony uses Vaio Shops for inventory control, logistics and marketing functions. Sony adopts different marketing methods for different products. In this way, Sony understands the purchasing patterns of Chinese customers of diverse regions by products as well and develops appropriate marketing plans.

Sony's SCM, therefore, integrates both supply and demand side through integrating product design, manufacturing/logistics and distribution channels. Sony positions itself as a market leader based on its brand power and value chain infrastructure (i. e., integration of supply and demand chain) for the growing Chinese demand for its broad range of household electronics goods.

3.2. Case of automobile manufacturers: Toyota and Hyundai in China

3.2.1. Toyota's global SCM strategy

The superior market position of Japan's Toyota is quite contrast to its performance in China. Toyota's sales in China are somewhat modest—8th among auto-manufacturers in Chinese market with 506,000 cars sold in 2011. Toyota is not so doing well in the emerging economies—particularly in China. Toyota's Chinese market strategy is to offer its finished cars through three plants in China. Toyota's partnership (50:50 ownership ratios) with First Train (Chinese auto-manufacturer) resulted in the establishment of Tianjin Nikki Toyota Train and Sichuan Nikki Toyota Train and Guangzhou Toyota Train. Each firm produces a different product line of Toyota. Tianjin Nikki Toyota specializes in small car Vios, Corolla, and mid-sized car, Crown. Sichuan Nikki Toyota focuses on the large car line—Land Cruiser. Different from Japan, Toyota in China focuses on small product lines in mass production.

Demand and Supply Chain Integration Strategy for Emerging Market

Toyota also applies JIT in China as well. This is to produce cars at the right time at the right volume and thus minimize inventory level. This method also requires multi-skilled workers that handle complex production processes. This production method has serious implications on SCM as well. In this section we examine practical issues related to this production method.

In China, demand patterns are quite uncertain because government policy changes are frequent and customer tastes and preferences are somewhat less predictable. In 2009 Chinese government reduced automobile sales tax by 5% for the engine size smaller than 1600 cc. That year Toyota's Vios and Corolla showed impressive sales records. However, with inaccurate demand forecast Toyota experienced frequent stockouts as well. From January to April 2009, Toyota showed negative growth compared to that of 2008 at the same period (Economic Information, 2009). In the rapidly growing Chinese market, what is crucial is not inventory reduction but to avoid sales loss opportunities.

It is not realistic to expect the same extent of success in China with the identical Toyota production methods that have been applied in Japan. Chinese national culture, value systems, educational backgrounds and customer preferences are quite different from those of Japan. Compared to Japan, Japan's car demand is fairly stable and the demand forecast is relatively easy. However, market turbulence in China is quite high and Toyota's traditional production and marketing methods are not quite applicable to Chinese market. For global SCM, securing right amount of component parts at the right time is quite important. Toyota's component parts localization target is 70% (Corolla and Crown), 85% (Camry) and even the long-term goal is no more than 90%. At present, more than 15%-30% of component parts are shipped from Japan. Thus, serious earthquakes in the month of March 2011 had serious supply chain disruptions in China. Toyota experienced more than 35% of reduction in their new car sales in 2011 compared to the 2010 records. It is critical for Toyota to increase the localization ratio for reducing total costs, production and logistics lead time. When Chinese automobile market experiences certain level of stability and maturity, Toyota's traditional methods would be more fitting. Until then, Toyota needs to make some modifications

in the ways they approach overall supply chain management including production and inventory control methods, timely market responsive action programs and sensible strategic approach to changing government policy initiatives.

3.2.2. Beijing Hyundai' s Global SCM Strategy

Hyundai, Korea' s major global auto manufacturer established Beijing Hyundai through joint venture (Hyundai and Beijing Train both 50 to 50% ownership) with Beijing Train (a Chinese firm) on October 2002. By 2003, Hyundai sold 52,000 cars in China and thus showed quite rapid sales growth in China. In 2010, the annual sales volume was 703,000 which recorded No. 4 auto manufacturer in China—better than any other Japanese automobile manufacturers (e. g. , Toyota and Honda). The key reason why Hyundai could achieve such speedy growth in China is its global SCM that integrates R & D, procurement, sales and marketing.

Beijing Hyundai focuses on extensive research on Chinese market. In 2011 it established Automobile Management Research Center in China. A senior Hyundai manager said, “Information on US auto-industry data and statistics is available and accessible. However, securing timely information on Chinese market is not that easy. It is crucial to be aware of to date Chinese government' s industrial policies and changing market reality. This is why we establish this research center.” (Dongyang Economic Daily, 2011). Thus, Beijing Hyundai' s tremendous growth is based on the comprehensive road map that includes quality market research of the emerging market, clarity of market goals, translation of marketing and sales. Through market research Hyundai management understands the unique and specific Chinese customer requirements and government directives and then carefully reflects them in their new products and services.

Beijing Hyundai adopt mass customization for total cost reduction. Hyundai increased both production volumes and product scope according to the market requirements. Hyundai' s product development processes consider changing customer tastes and preferences. Beijing Hyundai adopts Make-To-Stock (MTS) as a key manufacturing

Demand and Supply Chain Integration Strategy for Emerging Market

practice. MTS is to forecast customer demand in advance and produce required volumes. MTS allows speedy response to the changing customer requirements and reduce the risk for lost sales opportunities. Inaccurate forecast of customer demand, of course, would result in a huge level of unsold inventory. In this sense, Hyundai' s approach is quite in contrast to that of Toyota that focuses on low level of inventory.

Beijing Hyundai first understands the buying habits of Chinese customers and then executes MTS method of mass production. This is effective in view of China' s large market size. This is in accordance with the preference of Chinese customers who would rather purchase cars of their own choices instead of waiting after they place orders. Since each product line with sufficient size can achieve economies of scale, overall cost of production is also quite competitive. Hyundai' s production method does not require multi-skilled but simple-skilled workers. For example, the rates of automation of various processes are: (1) press and assembly of car body 100%, (2) stamping 60%, (3) final assembly 10%. Manufacturing lines rarely stop. The utilization rate is on average 99.5% (Plant 2 rate, 2009) and 98% (Plant 1 operation rate) (Toyama, 2010). In Hyundai, the tendency is to trust high process technology more than human touch. It is not their strategic priority to develop cross-trained workers who would engage in problem solving through Kaizen activities. Thus, discovery of quality problems is mostly by inspectors and problem resolution is expected by managers and production staff personnel (Oh, 2009; Park et al., 2012). Hyundai' s production is characterized by work simplification through modular division of complex work processes rather than highly skilled workers' Kaizen activities. Hyundai' s total work processes are usually twice of those of Japanese counterparts. Thus, any foreign workers that have very little communication ability can be deployed in the production processes. The total education and training time required is fairly short and thus the overall manufacturing process productivity in its oversea plants is very high (Inoue, 2011). In this way, Hyundai' s production methods are quite fitting to the work environment in China where worker turnover rates are very high.

Beijing Hyundai use 94% of component parts from China and the amount of import from Korea is no more than 6% (Toyama, 2010). Hyundai' s global production system utilizes

its strategic partners with their concurrent entry in China as well as localization of component parts through Chinese suppliers (Park et al., 2012). Routine component parts are all procured through Chinese suppliers for cost reduction effects. For strategic component parts Hyundai focuses on stable supply and high quality performance (Jung, 2005).

Hyundai Beijing takes market segmentation through rigorous classification of customer needs by different regions. It allows the operations of service dealers and satellite sales dealerships. Thus, Hyundai covers not only first rate customers in the coastlines but also penetrate medium and small cities with its low priced products (Lee, 2011). In 2009 Chinese government reduced automobile sales tax rates by 5 percent according to its rural automobile distribution policy. Hyundai's extended sales and distribution network is quite in line with such government policy changes and thus by 2009 Hyundai achieved noteworthy sales growth in Chinese market as a whole. In summary, Hyundai's comprehensive demand and supply chain integration (DSCI) considers external environmental changes (e.g., government automobile distribution and tax policy), devises right manufacturing processes (e.g., make to stock through high degree of automation), and configures distribution and marketing network channels.

4. Conclusion

This paper examined the SCM practices of electronic firms and automotive manufacturers in China. Successful firms implement comprehensive level of localization that includes staying vigilant on the changing market reality, savvy in governmental relations and adapt well to the competitive challenges. The supply and demand base includes the active participation of local firms through strategic outsourcing. With the extensive IT capabilities global firms achieve effective information flows on various levels. Even so, great deal of customer value translation requires compatible business environments that offer price competitive, time sensitive and quality superior products and services.

Demand and Supply Chain Integration Strategy for Emerging Market

Apple Inc., for example, regards refreshingly attractive design as its core competence and thus outsources its production functions and thus achieves cost advantage. In contrast, the core competence of Japanese firms is in their manufacturing capabilities. Clarity of strategic priorities is a must for these Japanese firms. Even in the areas of upstream R & D and product development, Japanese firms find the examples of Korean firms (e. g., Hyundai Motor Co) that achieve both quality and speed. Strengths of Korean firms is in their global supply chain management that is based on effective target market research, manufacturing capabilities and information integration across front- and back-end value chains. In the coming years, as more global firms turn their attention to the western regions of China, it is all the more interesting to see how successful global firms in China implement their supply and demand chain straggles.

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Demand and Supply Chain Integration Strategy for Emerging Market

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Demand and Supply Chain Integration Strategy for Emerging Market

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