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The issues with transnational fast moving consumer goods supply chains originating India and South Africa

Kumar, Dinesh

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6. INTERPRETATION OF FINDINGS

The findings presented in the previous section were interpreted for all four research cases simultaneously in order to identify similarities or dissimilarities within- and across-cases under the categories of general findings, the typology of the various supply chains, the issues within the various supply chains and the steps that supply chain managers were taking to deal with these issues.

6.1 General findings

Title and roles: The difference in the titles and roles of personnel was established between the packaged food and personal care segments. Personal care segment cases had more similar roles compared to the packaged food segment cases. Also, the roles among the South African cases were more similar compared to the Indian cases. The different maturity level of supply chains was identified as the reason behind the dissimilarity of these roles/titles (Deloitte, 2008, APICS, 2009). The personal care segment had been in existence for longer than the packaged food segment, and its adoption of the latest technology and trends enabled it to align its organisational structure and roles with best practices.

Figure 6-1 shows the supply chain functions for the cases in terms of the value chain model (Porter, 1998).

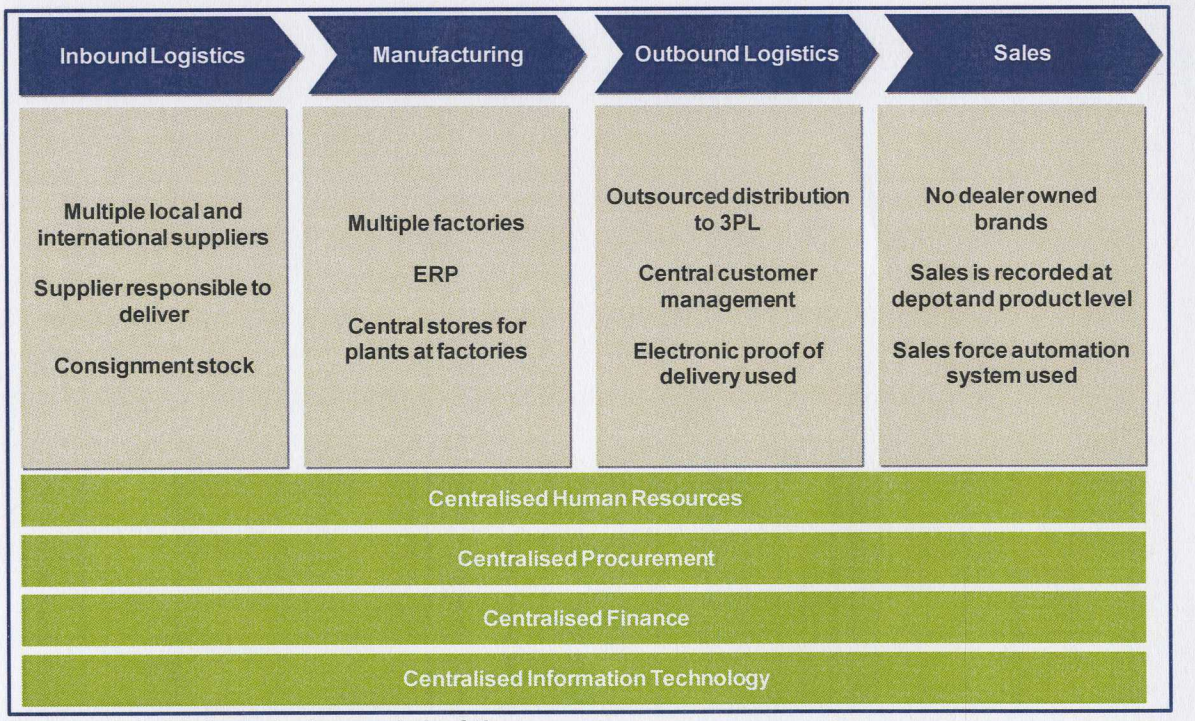

Figure 6-1: Value chain model of the cases

Support functions[104] were well defined and similar among all the cases. However, core functions[105] and titles were not similar, for two reasons. Firstly, supply chain functions were not aligned to a standard common definition of the term "supply chain". Secondly, the organisational structures of these cases had evolved differently and were not equally matured, resulting in different interpretations of the roles of those involved in the various supply chains. This confirmed that people with different roles were carrying out the various supply chain functions (Ayers, 2006).

Involvement with supply chain activities: Mentzer (2006) stated that all the support functions except procurement had limited involvement with the various supply chain functions. A similar trend was indentified with all four cases, except for a few exceptions at Surya. This may be due to the fact that at Surya the supply chain function was not fully seen as a core business activity and the focus of the organisation was on the production process. The procurement function, although a support function, was actively involved with the supply chain activities. Hence, the supply chain could be classified as a "core element" of an organisation (as it involved more core functions and fewer support functions) and also a "front office function".[106]

[104] Support roles were defined as per the value chain model. The support roles identified were HR, IT, procurement and finance (Porter, 1998).
[105] As per the value chain model, the core processes were inbound logistics, manufacturing, outbound logistics and sales (Porter, 1998). However, the SCOR model did not consider sales as a core supply chain process.
[106] As identified by several firms in terms of front (core) and back (support) office functions (Meakem, 2003).

Supply chain setup: In terms of the transnational setup, all the cases (except Dabur) were identified as national firms with overseas suppliers, manufacturing plants, DCs and customers (Deloitte, 2008). The number of SKUs and supply chain employees was similar for all four cases (except Surya), which reflected the conclusions drawn about the product range in section 2.2.1, which defined the FMCG industry (CII, 2005, Desai, 2008).

6.2 Typology

A common supply chain typology for all four cases was derived from the findings presented in the previous section. Figure 6-2 represents this common typology.

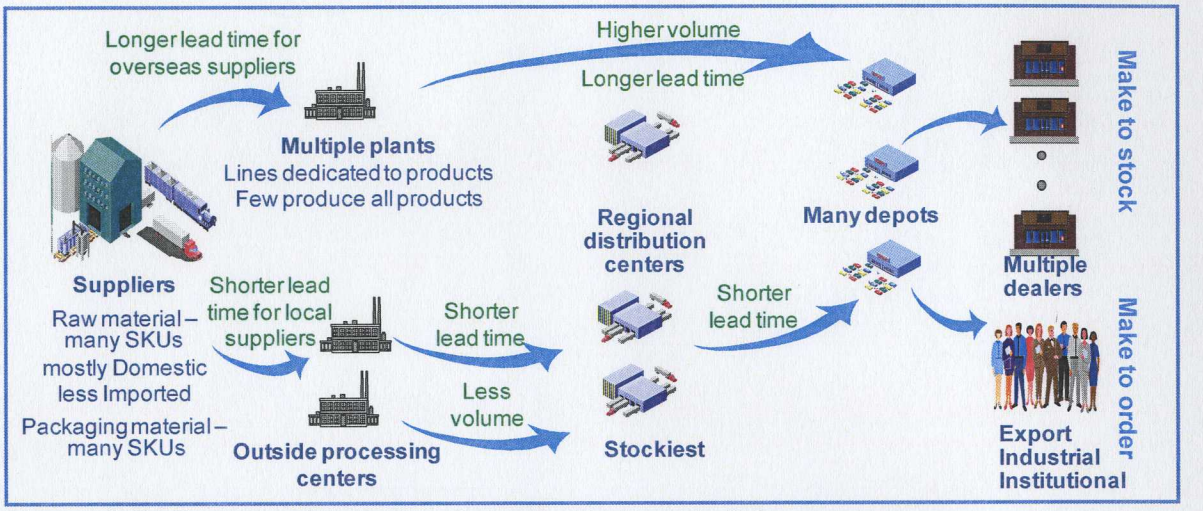

Figure 6-2: Common typology of supply chains of all four cases

This common typology was then analysed in terms of its functional and structural attributes.

6.2.1 Functional attributes

Products' life cycles: For the cases in both segments, the life cycles of their products was long (up to many years), while the shelf life differed between these segments. The shelf life was short to medium term (one to six months) for the packaged food cases and medium to long term (12 to 24 months) for the personal care cases. The beverages section of the packaged food cases had a shorter shelf life (one to three months). Hence, stricter quality control was required for these products and ignoring this resulted in higher returns. On the other hand, the personal care cases did not receive any queries related to shelf life.

This finding was aligned with the findings obtained during the literature survey (Stadtler & Kilger (eds.), 2007). The short- to long-term shelf life of the industry's products resulted in the quick replacement of products on the shelf. Retailers (such as Shoprite, PicknPay and Checkers) had also started playing a key role in defining the availability of the products, hence the related service levels. Figure 6-3 represents the life cycle of a product with its classification and its relationship to its availability in the market, as adopted from the SCOR model based on best practices.

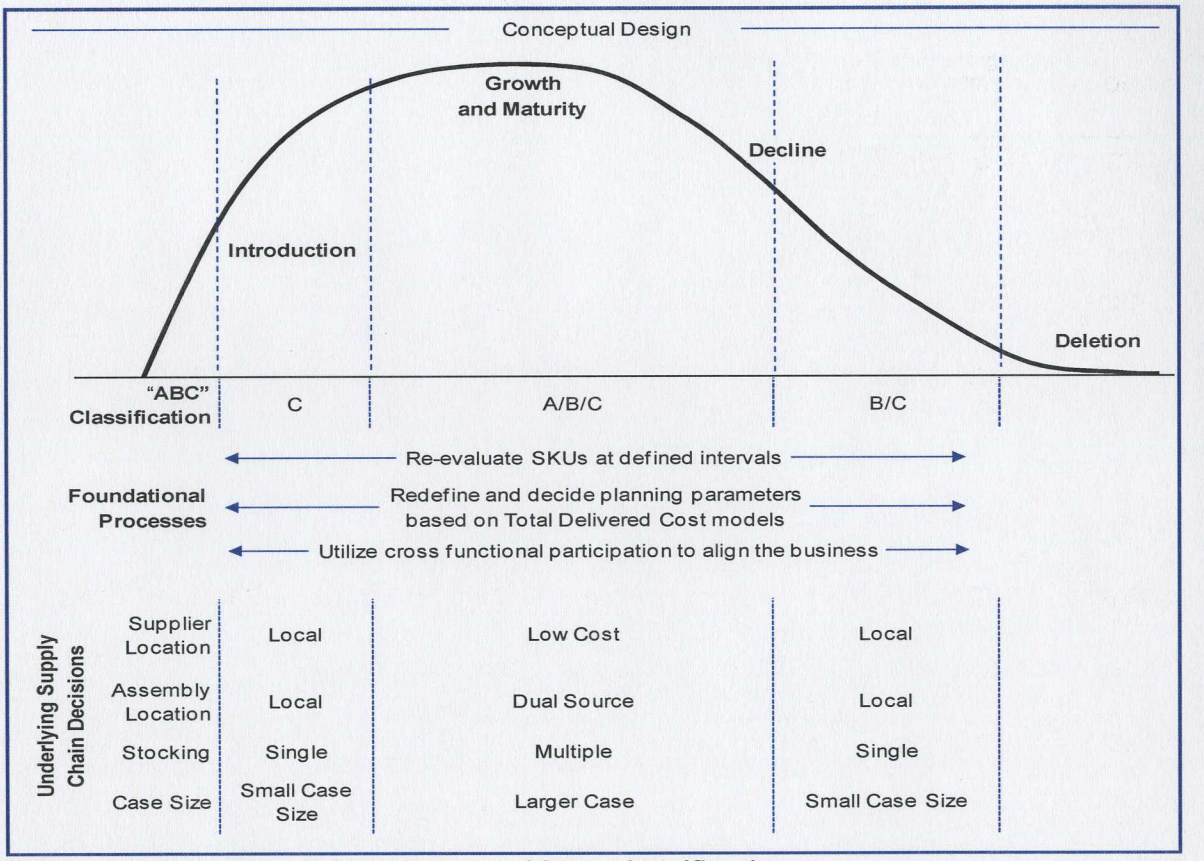

Figure 6-3: Life cycle of products and item classification

In all four cases, the majority of products fell into the category "growth and maturity", and the critical supply chain decisions related to the supplier location (low cost), manufacturing location (dual source), stocking policy (multiple) and delivery units (larger case) matched with the findings from the cases.

Distribution structure: All the cases used a similar distribution structure for finished goods consisting of three to four stages for local deliveries. They also used a push-pull philosophy, with the factory pushing the products to the DC and the retailers/customers pulling the products further down the supply chain. When compared with the findings of the literature review, the push-pull combination was a norm in MTS scenarios (identified for local orders), while for MTO scenarios, the products were always pulled from the factory, as was the case for overseas orders. This matched with the findings for the functional attributes that emerged from the literature review (Stadtler & Kilger (eds.), 2007).

However, the outbound distribution setup was different in the Indian and South African cases. The Indian cases used agents (CFAs) to handle their finished goods (Mishra, 2008), while the South African cases used 3PL service providers. This was due to different selling structures, maximum retail prices[107] in India, and margins in South Africa. This had a dual effect on the distribution structure. Firstly, it became simpler, because some of the complicated activities were not executed by the organisation, but handled by experts. Secondly, however, it also became complex from a risk perspective, as another element had become involved in the supply chain, making it more vulnerable (Kumar & Bala, 2009).

Products sold: All the cases sold standard products in cases units. FMCG organisations normally sold products in cases, as opposed to the hi-tech industry (which sold products by eaches). This also related to the higher lot size units sold as per the life cycle curve.

[107] It governed the maximum retail price an item. Retailers could not sell an item for more than its maximum retail price (stated by the FMCG manufacturer), although they could provide discounts.

In addition, all the cases handled SKUs in the range of 300 to 600. Personal care organisations (such as Revlon) handled up to 5,000 SKUs (David, Buckler, Mussomeli & Kinzler, 2005). Despite this, the large set of SKUs always created planning and execution challenges for the various supply chains, as this resulted in fewer products in the "A" category and a trail (large numbers) of "B" or "C" category products.[108] This resulted in reducing the amount of management time spent on higher category products. Appendix D7 presents a generic approach for SKU rationalisation.

Sourcing type: Most of the raw and packaging materials used by the cases were single sourced. In some scenarios, multiple sourcing was used for critical raw materials, such as potatoes, in order to ensure a regular supply. The personal care cases had more options to use multiple sources for raw materials; however, the packaged food cases used mostly single sourcing due to their quality assurance requirements.

It could be interpreted that sourcing type was very dependent on the type of product involved and the criticality of raw materials. Since packaging materials were non-critical, they were single sourced locally, and only a few of the raw materials were imported from single sources for all four cases. This finding matched the concept of the localisation of suppliers in order to reduce lead times (Morgenstern, 2006).

[108] A/B/C categories were defined as per the Pareto's analysis. The supply chain decisions for them are shown on the product life cycle curve.

Products procured: It was established in all four cases that raw materials and packaging materials were the two types of products sourced from suppliers. A split of 75:25 percent split was identified between raw materials and packaging materials for all the cases. However, in the personal care cases, in some instances finished and semi-finished products were also sourced from subcontracted manufacturers in cases of short capacity or if it was necessary to meet shorter order lead times (Kumar, 2002, 2004). This did not apply to the packaged food cases, again due to the stricter quality control requirements of this product segment.

Critical raw materials were often sourced from overseas, making the procurement lead time longer.

Production process: The production process (including packaging) identified for all four cases consisted of three- to four-stage batch production processes. The production process was either designed in a sequential or a "U" layout and the final stage was always packaging, with products being packed into different pack sizes. In the packaged food cases, in some production setups, a flow process stage was also used. The production process was very similar in the two countries studied.

In the personal care cases, the products were sometimes produced only to the semi-kit stage and then transferred to sister firms or overseas entities for further finishing. This finding was in line with the subcontracted manufacturing functionality of FMCG firms that was identified during the literature review (Kumar,

2002, 2004). In essence, the production process within the FMCG cases was simple, and in some instances outsourced to subcontracted manufacturers. Therefore, the production process was not identified as a major strength of this industry.

Repetition of operations: In the production and distribution operations of all the cases, a degree of repetition was identified.

The literature review established that FMCG supply chains used a complex distribution structure, and occasionally there were a "repetitive operations" within the distribution environment, which was sometimes due to multiple storaging and handling activities, often enabled by the involvements of 3PL entities. These repetitive operations were not established as non-value-adding activities in the supply chain. This finding needs further investigation, as the principles of lean manufacturing specify that repetition of operations is a waste (Womack, Jones, Roos, 2007).

Pattern of delivery: In the Indian cases, the pattern of delivery varied, and products were sometimes delivered to a stockist and at other times to retailers. Deliveries between the factory and the main warehouse were always FTLs, while deliveries from the main warehouse to overseas entities were FCLs. In the South African context, the cases used outsourced 3PL to address their distribution requirements. In that case, the 3PL providers used their own infrastructure and networks to deliver products to customers.

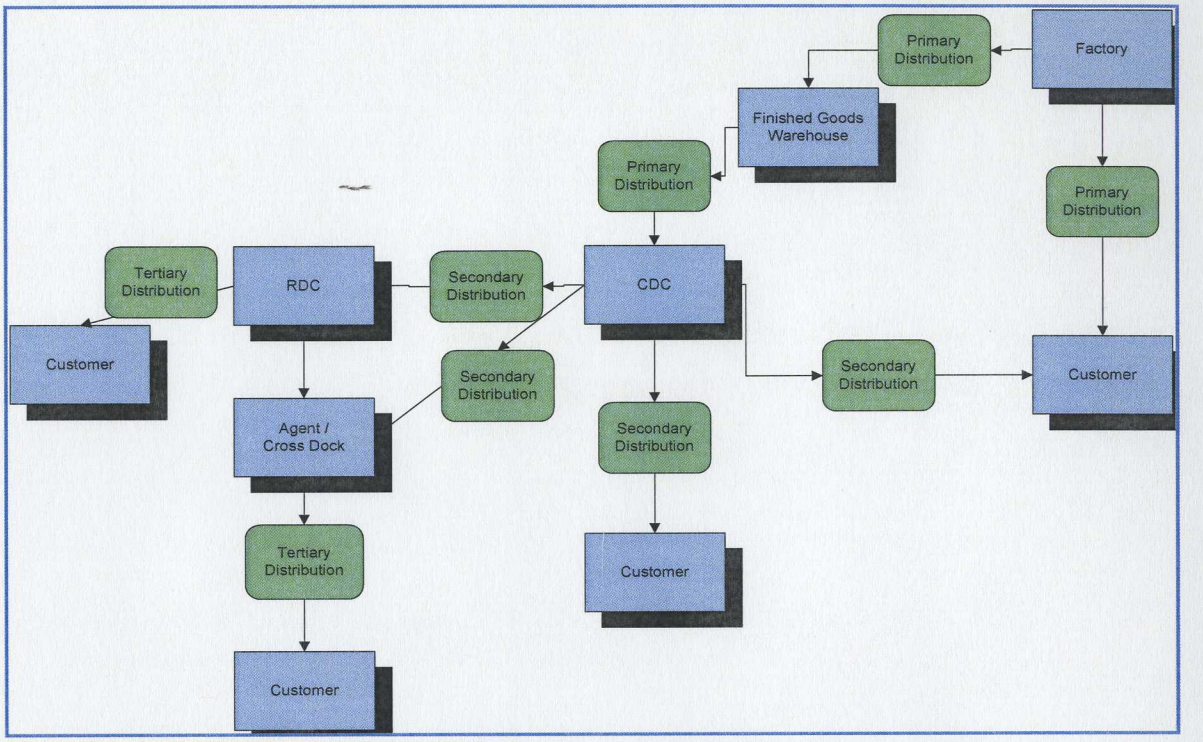

Figure 6-4: Delivery options in a dynamic environment

Figure 6-4 summarises the dynamic pattern of these distribution networks and gives a complete set of the various distribution structures as obtained from the cases. The overseas deliveries used only the primary distribution leg, while local deliveries used all the different combinations of methods (Kumar, 2009b). The pattern of delivery was found to be dynamic (could follow any of the possible routes) based on the demand requirements (Stadtler & Kilger (eds.), 2007).

Deployment of transportation: As loads needed to be delivered across transnational boundaries, the modes of transport used were a mixture of rail, road, sea and air. Since the South African firms are located geographically very close to their clientele bases in neighbouring countries, in most instances loads were transported by rail and road.

For local deliveries, a combination of road and rail transport was used in both countries. Figure 6-5 shows the split of the usage of rail and road transport.

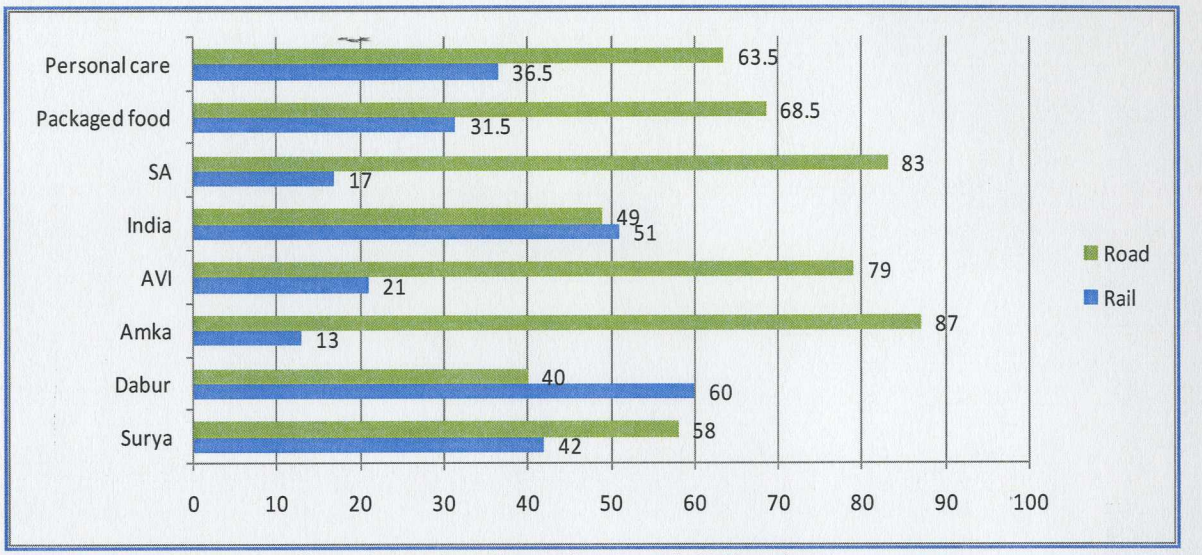

Figure 6-5: Use of rail and road options for local deliveries

The South African cases used more road transport, resulting in higher transport costs, because their customers were not happy with the service levels offered by Transnet (the state-owned rail service provider) (King (ed.), 2008). However, this was not the case with the Indian cases. The personal care cases used a combination of all modes of transport, while the packaged food cases could only use a restricted set of transport modes due to the short shelf life of their products.

Loading restrictions: The cases used different loading criteria. For the personal care cases, the objective was to optimise container space by loading containers to the brim for both local and overseas deliveries. However, for the packaged goods cases, loading restrictions were complex. The concept of top and bottom pallets was applied, with heavier items stored on the bottom pallets and lighter items on the top pallets, and the maximum height of pallet loads was also restricted in order to avoid damage to goods in transit.

Loading restrictions were uniquely found in the FMCG industry. The concept of top and bottom pallets was only used in this industry and acted as a major challenge in achieving greater transportation efficiencies.

Relation to customers: For all the cases, the overseas customer base was quite static, up to 95 percent. Most of the customer base was known to the firms through overseas sales offices and agents, and since agents were the customers in some cases, this made overseas demand planning very simple (Joerg, 2006, Kumar, 2009a). However, the market penetration strategy used by particular cases could make the relationship with overseas customers unpredictable in future. Nonetheless, despite this stability in the customer profile, it was a surprising fact that demand was still difficult to forecast, partly due to the intermittent nature of overseas demand. The local customer base was very volatile and was faced with tough competition, resulting in a complex demand planning process.

Availability of future demand: For overseas markets, the customer base was quite static, so it became easier to forecast future customer demand (Kumar, 2009a). However, because demand was intermittent, the forecasting process was complex. Forecasting for local sales was simpler due to the high volumes, but complex at the same time due to the large number of SKUs involved.

In addition, none of the cases, except AVI, used APS systems to forecast accurately. These tools were adequately used by leading FMCG firms elsewhere

(Unilever, 2007). The cases could not transform their Excel-based data-crunching forecasting exercise into an optimised and automated process.

6.2.2 Structural attributes

Network structure: In all four cases, the network structure of their transnational supply chains was a mixture of sequential and tangential systems. DCs were geographically located throughout the supply chain network, and local deliveries made more use of this structure than overseas deliveries. The Indian cases used a decentralised warehouse/distribution structure because of the complex taxation system (state and octroi tax) (Easton, 2003). Since South Africa did not have this kind of complex tax system, a centralised distribution structure was more common among South African cases. In essence, the network was a matrix structure with a mixture of centralised and decentralised entities. These findings were aligned with the findings from the literature review (Morgenstern, 2006).

Degree of globalisation: In all four cases, a great degree of globalisation existed in terms of supplier base, sales offices and customers. This confirmed the transnational elements that were identified in the literature (section 2.6.2). Manufacturing and distribution bases were more restricted to the base country, mostly for the packaged food cases. This was due to the strict regulatory framework and complex manufacturing process faced by this product segment.

Legal position: The legal position of the transnational supply chains was intra-organisational for all the cases. However, with the presence of independent

overseas sales offices and agents, the legal position was shifting to an inter-organisational one.

The legal position reflected the financial setup of the organisations. With transnational supply chain arrangements, in some instances, in order to gain the benefits of particular tax structures, ownership of the supply chain shifted to overseas entities. As was also identified in the literature, the use of tax havens (such as Mauritius, Puerto Rico and Ireland) for financial reporting purposes was not classified as a transnational factor in this thesis.

Location of decoupling points: The matrix nature of the network structure, the degree of globalisation and the shift in the legal position affected the strategic location of the inventory holding points that acted as decoupling points in the supply chain (Kumar, 2002, 2004, Stadtler & Kilger, 2007). Decoupling points broke the push-pull supply chains and acted as consolidation and deconsolidation points in the supply chain. Table 6-1 lists the decoupling points identified in the local and overseas distribution supply chains.

STORING AND HANDLING FACILITY OPTIONS							
		TYPE					
Terminology	ACRONIM	1	2	3	4	5	6
Finshed Goods Warehouse	FGW	X	X				
Central Distribution Centre	CDC		X	X			
Regional Distribution Centre	RDC		X	X	X		
Cross Dock Facility	X-DF		X	X	X	X	
Transhipment Centre	TRC			X	X	X	X

Table 6-1: Decoupling points in the supply chains

According to the above table, cases used a mixture of decoupling points for their local deliveries. However, for overseas deliveries, the decoupling point for all the cases was the finished goods warehouse or central DC.

Types of information exchanged: All four cases used EDI as a medium to exchange information with their partners. The type of information exchanged varied among the cases (Kumar & Kumar, 2009). The South African cases shared forecast and shipment information with their suppliers and delivery information with their overseas sales offices. The Indian cases did not share forecast information with their suppliers.

The lack of shared information regarding forecasts, inventory, shipment, etc. resulted in ineffective supply chain planning (Seifert, 2003, Dupre & Gruen, 2004, Denese, 2006, Joerg, 2006).

6.2.3 Summary

In essence, the functional and structural attributes of the supply chains of the cases matched the functional and the structural attributes identified during the literature review. These findings are summarised in the following table:

Finding	Proposition	Result
The functional and the structural attributes of the supply chain of the cases supply chains matched with the functional and the structural attributes of the FMCG supply chain discussed in the literature.	The typology of transnational FMCG supply chains originating in India and South Africa is not different than that identified in the literature.	Proposition was **supported**.

6.3 Supply chain issues

The supply chain issues affecting the cases identified in the previous section were analysed in terms of operational performance (performance attributes), financial performance (indicators) and governance performance (aspects).

6.3.1 Performance attributes

In addition to the common typology of the supply chains (figure 6-2), a common supply chain planning workflow process was developed for all four cases and analysed in terms of the findings from each individual case. Not all of the planning elements were adopted by the cases, e.g. only AVI and Amka used the S&OP process, while only Amka used DRP. Figure 6-6 represents the common supply chain planning workflow across three planning levels: strategic, tactical and execution.

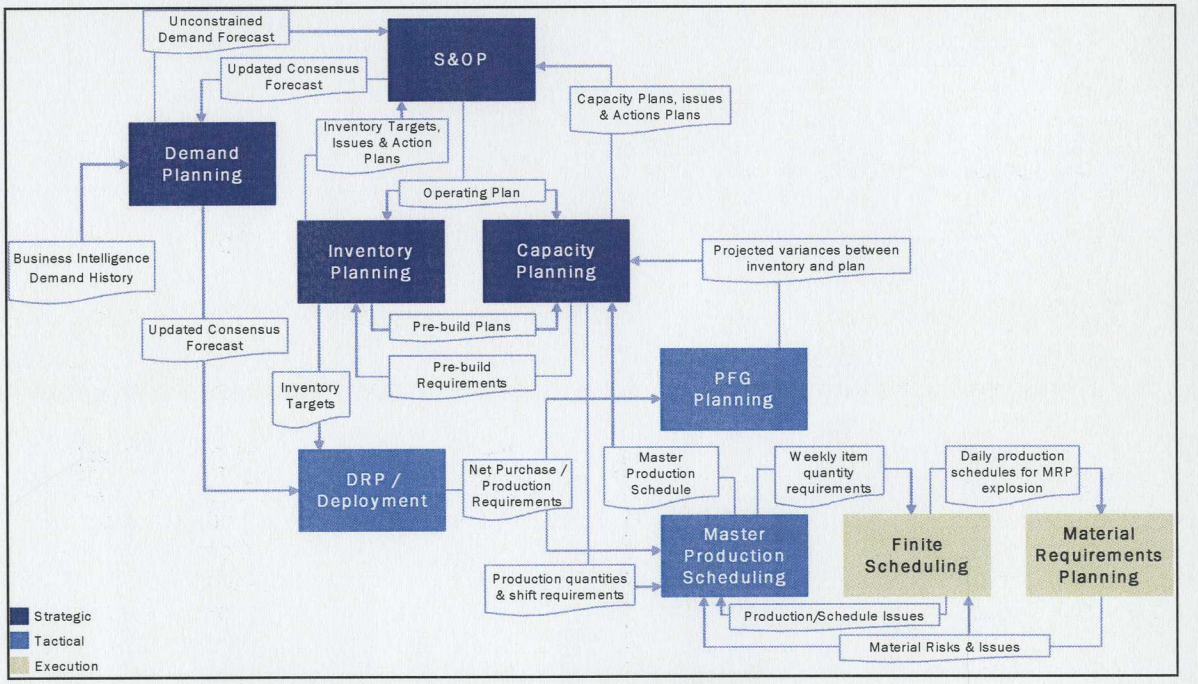

Figure 6-6: Common supply chain planning workflow

This planning workflow was a subset of the process flow diagrams obtained for the transnational FMCG supply chains, as presented in detail in Appendix D8.

Supply chain reliability: A higher perfect order fulfilment was achieved for overseas orders by all four cases except for Surya. However, reliability decreased for local orders. Despite this, overall supply chain reliability had increased. This was due to the economic downturn, which affected the sale of products in the local market and forced the cases to shift focus to servicing transnational demand.

However, the inadequate quality of some of the products and the damage/theft in transit had a small negative impact on supply chain reliability (these were execution risks as highlighted by Kumar & Bala (2009)).

Supply chain flexibility: Upside supply chain flexibility and upside/downside adaptability were lower for overseas orders in all four cases (Londe, 2006). Once capacity was geared to fulfilling overseas orders, it was difficult to change the production process. Also, once shipments were shipped, it was not economical to effect a change in the shipment schedule or the lot size. Flexibility was comparatively higher for local orders.

The issue of flexibility was closely related to the adaptability of the organisations, i.e. their ability to change their supply chain plans according to changing customer requirements. It was noted that flexibility was reduced because of the longer lead times and bigger lot sizes that characterised transnational supply chains

(Blackhurst, Wu & Craighead, 2008). However, this finding did not support the typical definition of FMCG supply chains.

Supply chain responsiveness: The order fulfilment cycle time was stretched and lengthened because of the longer lead time involved in sourcing raw materials from overseas suppliers. The lead time for overseas deliveries was also longer, which reduced the responsiveness of the supply chain (as stated by Christopher, 2007) in all four cases. This also had a negative impact in that it increased the delivery lead times of local orders.

The higher inventory levels maintained by the cases were a reflection of the reduced responsiveness of their supply chains.

Supply chain costs: It was apparent in all four cases that supply chain costs had increased because of increased logistics costs (Ray, 1975, Kumar, 2009a). The LCCS model previously adopted by the cases involving sourcing raw materials from China was no longer effective because of increased fuel costs (Kumar & Bala, 2009). In addition, the total cost of ownership of imported materials was higher than the savings received from the reduced prices of these materials.

In addition to the logistics cost, other factors were inventory and holding costs. The long lead time in transnational supply chains also resulted in increased inventory levels and unnecessary working capital being tied up.

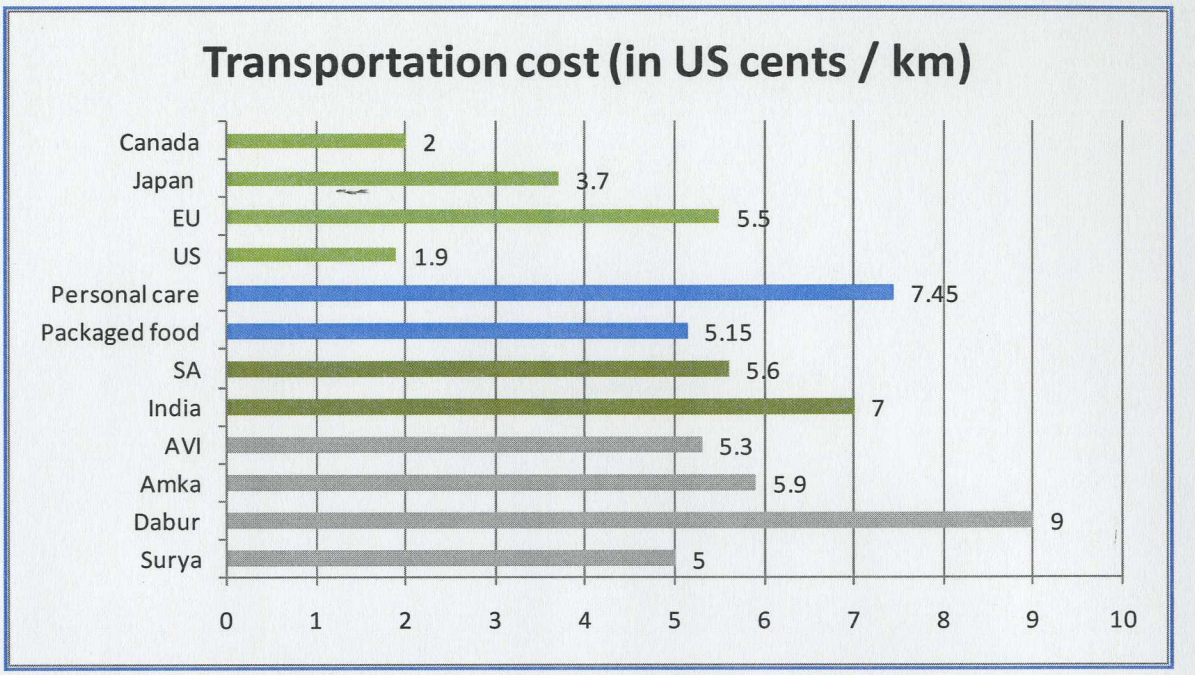

Figure 6-7: Transportation cost in US cents per km

Figure 6-7 indicates that lower volumes and specialised transport requirements (e.g. frozen or chilled containers) resulted in higher logistics costs for the packaged food cases. Costs were higher in India due to the state of the infrastructure in that country.

The split of the logistics costs for the Indian and the South African cases provides a clearer picture of the reasons behind the higher logistics costs. The higher inventory costs of the Indian cases (especially the personal care cases) resulted in higher logistics costs. The higher transportation costs in South Africa for both the cases resulted from the use of trucks for distribution, while the Indian cases used a combination of road and rail transport. Also, administration costs were higher for the South African packaged food cases, because of the strict regulatory requirements of the product segment (Cilliers & Nagel, 1994). Figure 6-8 shows the relative logistics costs experienced by the cases.

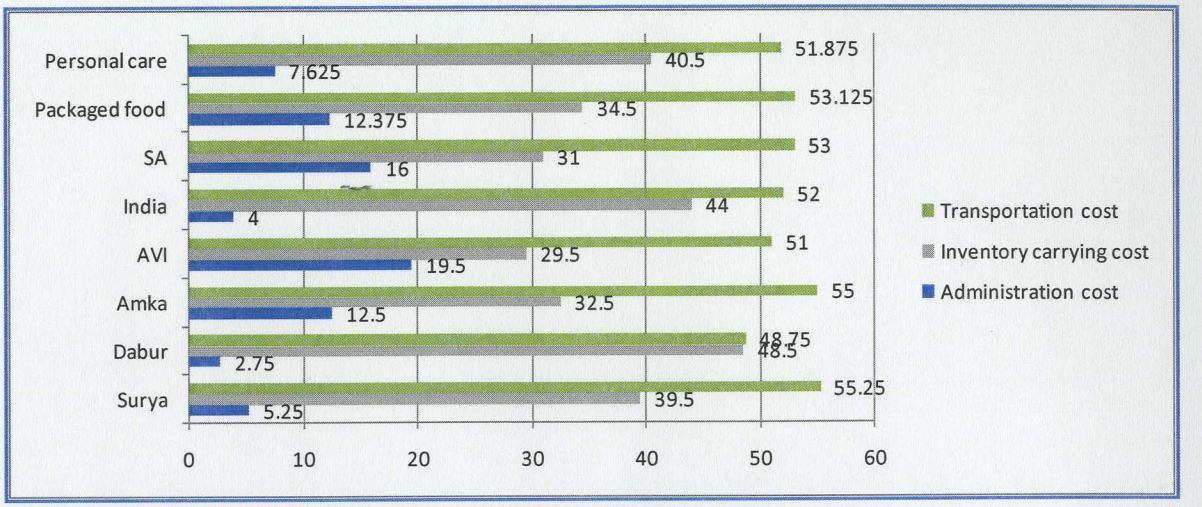

Figure 6-8: Split of logistics costs for the cases

Supply chain asset management: The intermittent nature of overseas demand identified in all four cases negatively influenced asset utilisation. The cases tried to improve their asset utilisation by allowing overseas demand to consume extra capacity during an economic downturn. However, overall, asset utilisation was reduced for all cases due to lower local demand (the major user of assets), despite the outsourced manufacturing and distribution arrangements used by the personal care cases.

6.3.2 Financial indicators

The findings presented in section 5 were further analysed in terms of financial indicators, i.e. the income statement and the balance sheet elements.

6.3.2.1 Income statement

Sales: Overseas demand was intermittent for all four cases. However, the economic downturn had forced the organisations to shift their focus to the overseas markets, resulting in their achieving higher order fulfilment and

eventually increasing their sales. The slack caused by weakening local demand was taken up by the overseas orders, allowing the firms to achieve higher sales overall.

Sales returns and allowance: Returns were higher for overseas orders due to quality-related issues and non-adherence to delivery timelines. One of the main reasons identified for this was that the packaged food cases did not study the international regulatory laws to identify the quality requirements that they had to adhere to (Parthasarathy, 2008). The personal care cases also experienced higher returns because of missed delivery timelines.

Cost of goods sold: The COGS for all four cases was higher because of higher logistics costs and the increased cost of raw materials because of longer lead times (Londe, 2006, Vorley, 2006).

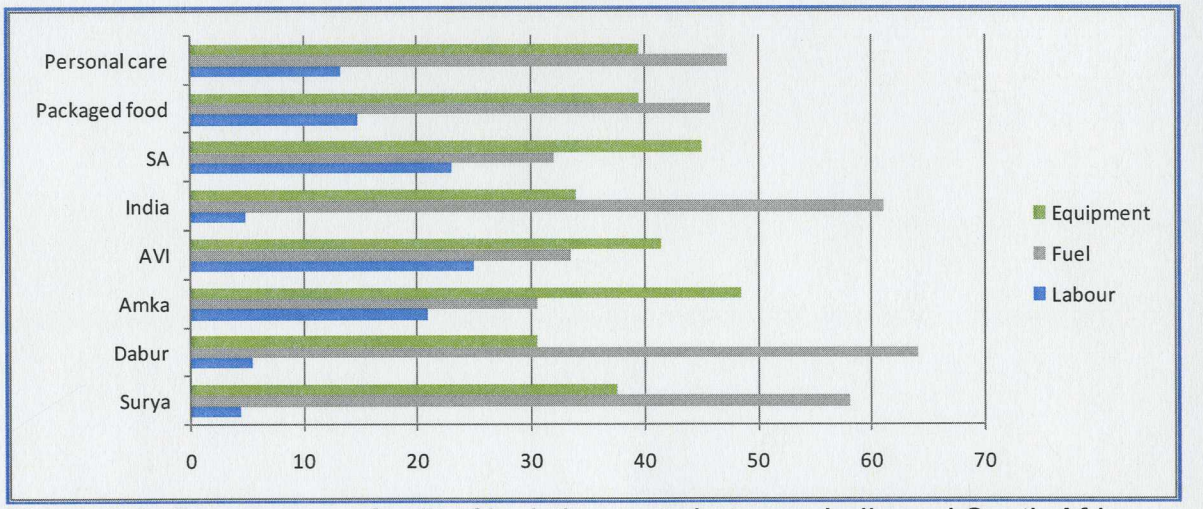

Figure 6-9: Comparison of split of logistics costs between India and South Africa

Logistics costs, a key element of COGS in FMCG supply chains because of the industry's complex distribution networks, were very similar in the two countries,

although the split of the logistics cost among the various elements such as labour, fuel and equipment costs showed considerable dissimilarity. Labour was cheaper in India and thus formed only a small percentage of the logistics cost in that country, while fuel carried the largest percentage of the logistics cost. In South Africa, equipment costs were the largest cost among the three elements (King (ed.), 2008). Logistics costs for the personal care and packaged food cases were similar, although fuel costs were higher for the personal care segment due to the extensive distribution network needed by this product segment to supply rural areas, whereas packaged food products did not have the same market penetration.

The COGS was very similar to the supply chain costs (as discussed in the previous section).

Selling, general and administrative expenses: The increased cost of the advertising and marketing needed to promote the brands in overseas markets had increased SG&A expenses. This was established for all four cases, with the packaged food cases having the largest budget for these expenses in the two product categories.

6.3.2.2 Balance sheet

Inventories: Longer lead times, as identified in all four cases, resulted in higher inventories across all the stages of production and distribution. Raw materials, WIP and finished goods inventories were found to be higher. In-transit inventories were also higher because of longer transportation lead times (Friedman, 2007).

Fluctuation and hedge inventories were also higher because of intermittent demand and fluctuating exchange rates. The finished goods inventory holding in transnational supply chains was slightly higher to that in local supply chains for all four cases (this matched with the views of Morgenstern, 2006). Finished products were stored at the firms' main warehouses and at wholesalers, and these acted as the decoupling points in the transnational supply chain.

Inventories were considered to buffer any uncertainty in demand and supply and to shorten the long lead times (Denise, 2009). Figure 6-10 presents a summary of the various types of inventory requirements that were identified from the cases.

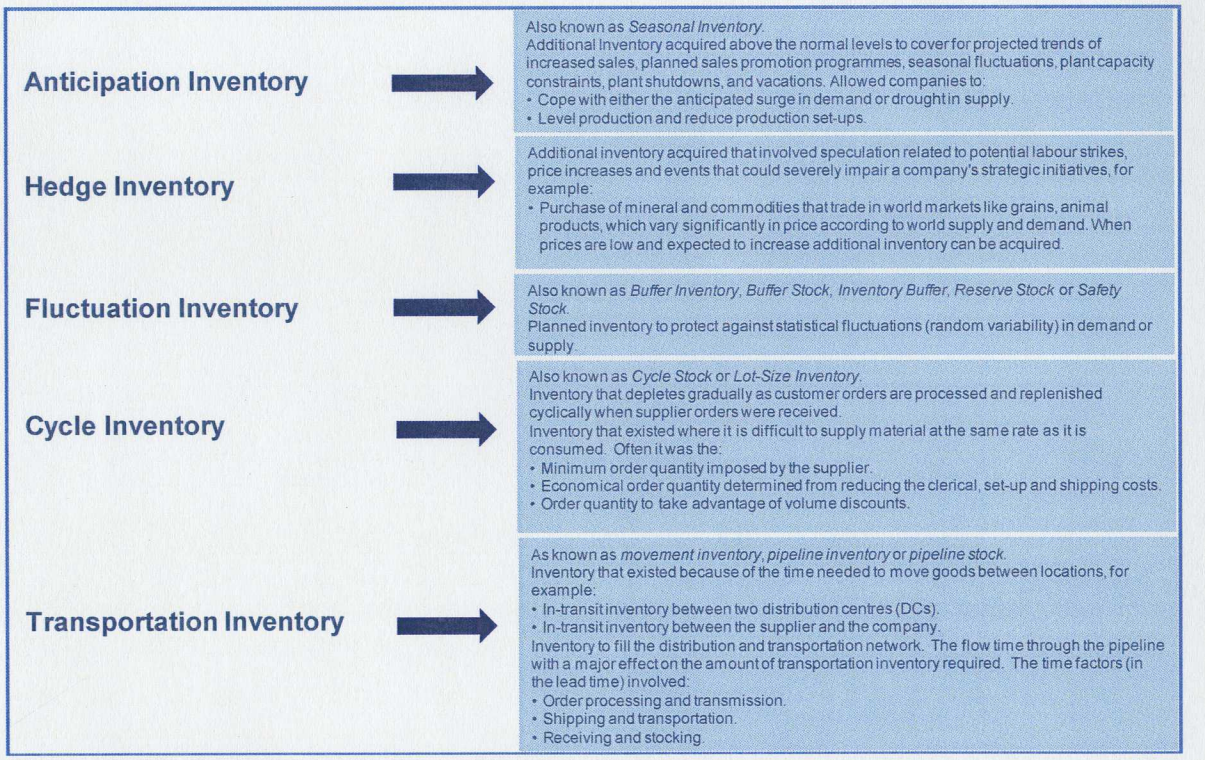

Figure 6-10: Summary of types of inventories

All the above types of the inventories were identified in all four cases. However, the hedge and transportation inventories were the largest due to forex fluctuations and longer transit lead times.

A comparison of the inventory days of supply among the cases showed that the Indian cases had higher inventories as compared to those carried by the South African cases, due to the longer lead times involved in servicing local and transnational demand. Also, the inventory days of supply for the personal care foods cases were higher due to the longer shelf life of their products. The inventory days of supply of the cases were also compared with those of Brazil in order to benchmark the findings. Figure 6-11 represents the comparison among the IBSA countries and among the four cases.

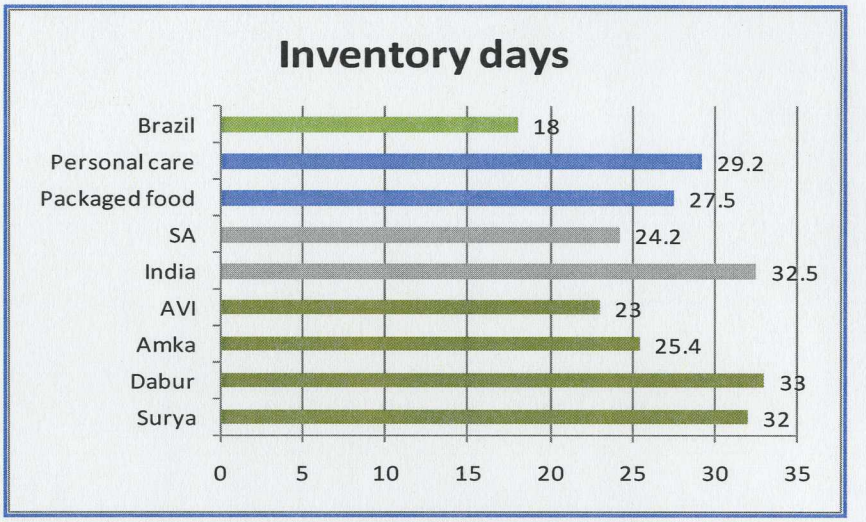

Figure 6-11: Average inventory days of supply

Property, plant and equipment: The utilisation of assets was not optimal because of intermittent overseas demand. However, the property, plant and equipment inventories were higher across all four cases, as they had ventured into a series of investments in strategically located DCs in order to expand their local and international footprints.

The next three categories deal with the cash flow issue.

Account receivables: Because of longer payment terms, accounts receivables were higher across all four cases. All four cases experienced a longer payment cycle (and therefore a longer cash-to-cash cycle) for international orders. The foreign exchange fluctuations sometimes made the payments process a complex exercise.

Cash and cash equivalent: The working capital tied up (due to higher inventories), longer payment terms and lower asset utilisation resulted in lower cash and cash equivalent levels. It was found that cash flow was a constraint for all four cases. In the face of the unprecedented 2008-09 credit crunch, organisations were trying to do everything to free up their working capital (Deloitte, 2009c, Matson, 2009). The cash-to-cash cycle was also longer due to the longer payment terms for overseas customers (90 days) than for local customers (60 days).

Accounts payable: Accounts payable were lower because in some cases advance payments were required for securing supplier deliveries. Amka had to make advance payments to Malaysian suppliers to secure supplies, while Surya normally made payment after receiving the raw materials. However, lower accounts payable had a negative impact on the performance of the supply chain.

In summary, the optimisation of working capital [109] represented a significant opportunity to improve shareholder value (Deloitte, 2009c). The objective for all

[109] Working capital was defined as the excess of current assets over liabilities, comprising of accounts receivable, inventory minus accounts payable, and represented the liquidity a business required for the day-to-day operations.

four cases was to close the gap between cash in and cash out, as depicted in figure 6-12.

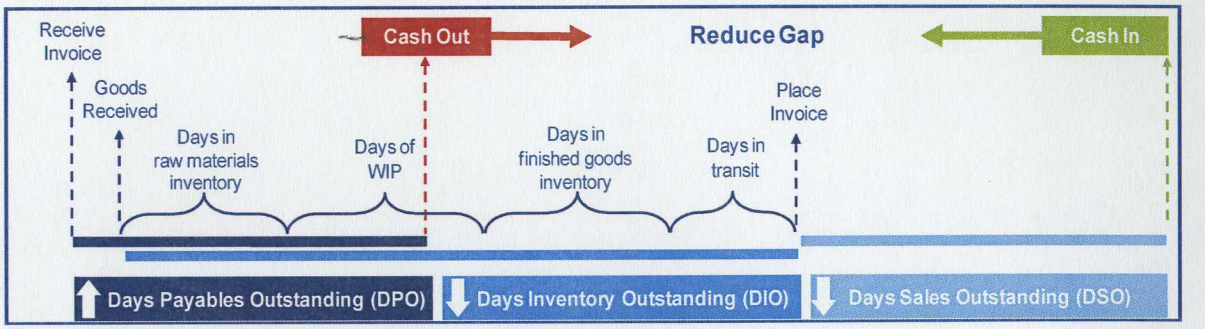

Figure 6-12: Cash flow balancing

6.3.3 Governance aspects

Policies: Not all the cases had established policies for transnational supply chains. Except for Surya, all the cases had policies and procedures for managing local supply chains. No SLAs with suppliers or customers existed in any of the cases. Only Amka had international quality certifications such as ISO 9000 in order to standardise its supply chain processes. As identified in the literature review, the FMCG industry lacked standard supply chain policies. The absence of supply chain strategies and policies was resulting in non-standard practices and weak governance controls.

Aligned strategies: All the cases except Surya had a high-level strategy for their local supply chains. Supply chain strategies were rolled from the firms' business strategies; however, linkages to operational strategies were lacking in all cases. The linkage between these strategies is shown in figure 6-13.



Figure 6-13: Interlinking supply chain objectives to business strategy
Source: Adapted from Rockhold, Lee & Hall (1998:18)

Another interesting finding related to the transition among the strategic, tactical and operational planning levels. This transition and integration among these levels were not evident in the cases. The benefits that were achieved from optimisation at one level did not roll over to the next level. This gap confirmed the finding of Barloworld Logistics (2009) that the business and supply chain strategies had to be aligned if organisations were to deal with the complexities of globalised supply chains.

Measurements: In all four cases it was found that mostly lower-level measurements were used. However, the measurement style of a particular supply chain was dependent on the type of supply chain strategy used (agile or lean) (Rushton, Baker & Croucher, 2006, Lofstock & Foucher, 2009). Table 6-2 shows some of the measurement KPIs based on the type of supply chain involved.

		Supply chain performance		
Type of Supply chain		Supply chain measure	Supply chain sub measure	Supply chain metric
	Efficient	Cost, price (market winner)	Total chain cost Purchasing price	USD/purchased item
	Quick/Agile/ Market responsive	Delivery Quality Flexibility (market winner) Cost	Delivery reliability Quality conformance Flexibility (mix) of production Total chain cost	% PPM % USD/purchased item
	Lean	Primary: Cost (market winner) Quality Secondary: Delivery, Novelty and Customer service	Total chain cost Purchasing price Quality conformance Delivery reliability, Delivery (lead time)	USD/purchased item PPM % Weeks
	Hybrid (lean & quick/agile/ market responsive)	Quality, Delivery, Cost, Flexibility	Quality conformance, Delivery reliability, Total chain cost Purchasing price Flexibility (mix) of production	PPM % USD/purchased item %

Table 6-2: Measurement criterion for different types of supply chain

As the cases did not adopt a clear supply chain strategy, the design and selection of measurement criteria were difficult to identify. However, it was found that whatever the measurement criteria used, the measurement should be able to percolate up and down between levels.

Leadership and culture: The supply chain management function across all four cases had a clearly defined leadership role, except for Surya. In all four cases, the leadership role was based at the central planning office, which overlooked supply chain internal functions such as sourcing and IT, and external functions such as outsourced manufacturing and distribution. Transnational factors created misalignments among the cultures (Portes, 1999).

The supply chain manager was the defined leader of the supply chain, although the profile was called by other names such as "procurement manager", "sales manager", "manufacturing manager", "operating officer" and "customer service manager". Strong supply chain leadership was identified as a key strength of FMCG supply chains.

People skills: Supply chain skills were identified as a critical element in all four cases (as indicated by Bureau of Labour Statistics, 2009). It was found that the staff of all four cases possessed adequate supply chain skills. However, an understanding of the impact of their silo decisions on the broader supply chain was lacking (Ayers, 2006, Mentzer, 2006).

Talent management was important for this industry during the economic downturn. The people staffing the various transnational supply chains needed to possess the skills to manage the basic operations and the people who executed them, but they also needed advanced planning and optimisation expertise (APICS, 2009).

Structure: The supply chain structure was well established in all the cases except for Surya. The structure addressed supply chain functions such as planning, sourcing, manufacturing, distribution, customer care and reporting. The cases used a mix of supply chain structures ranging from centralised to centre-led, resulting in a matrix structure overall (Joerg, 2006).

Functional integration: The South African cases used the S&OP[110] forum to integrate their supply chain functions (Sheldon, 2009), while the Indian cases held regular meetings to integrate these functions.

Figure 6-14 shows a standard monthly S&OP process with key results and participants; such a process was not fully used by all the cases. Surya did not use

[110]S&OP was a collaborative, cross-functional, monthly process designed to reach consensus on a single operating plan that allocated critical resources (capacity, materials, people, time and money) to most effectively meet demand in a profitable way.

the S&OP process and Amka discontinued it. Dabur and AVI had not adopted the complete cycle, leaving gaps (in terms of performance measurement and participation) that made the S&OP process less effective.

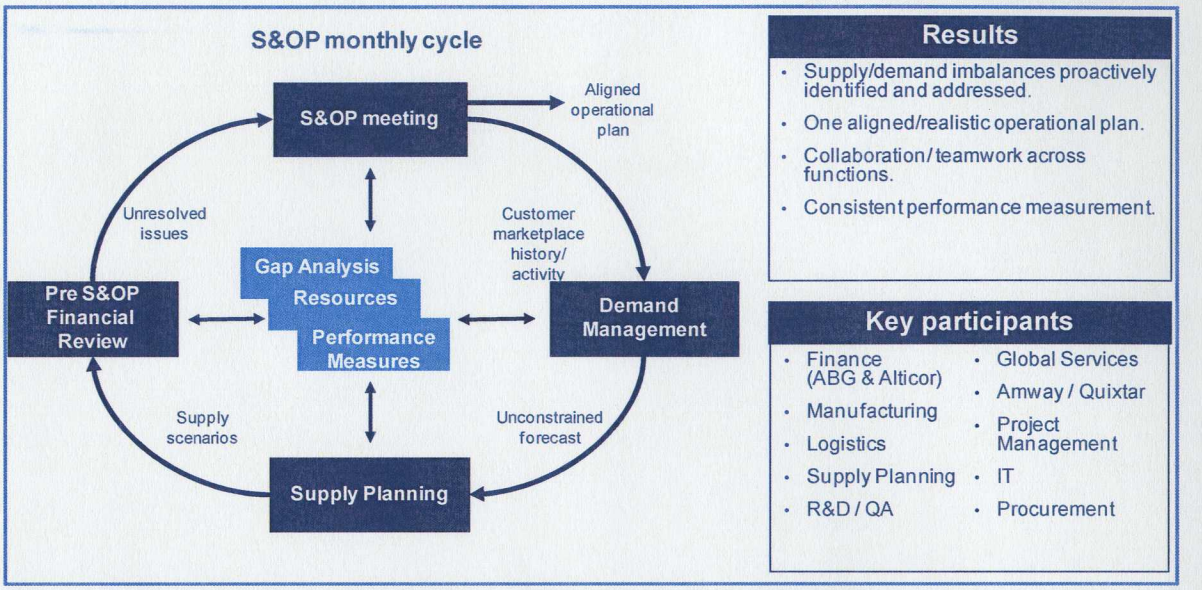

Figure 6-14: Monthly sales and operations planning process

Business technologies: A well-structured standard ERP could only be identified in three of the cases, while Surya used a system that had been developed in-house. AVI used an APS system to optimise demand, inventory and distribution planning (Connaughton, 2008).

A transaction recording system was a basic requirement of all the organisations in order to achieve functional integration. A standard ERP system was used by many leading FMCG organisations and an APS system was required to optimise supply chains holistically.

6.3.4 Summary

These findings are summarised in the following table:

Finding	Proposition	Result
The findings/issues within transnational FMCG supply chains from the research were as follows: a. increased supply chain (product) costs/COGS. **b. reduced supply chain service levels except for AVI.** c. reduced supply chain flexibility. d. increased supply chain reliability. e. reduced supply chain responsiveness. f. increased supply chain asset management. g. increased product lead time. h. increased inventory. i. increased sales and SG&A allowances. j. lower cash & cash equivalent. k. lower cash flow. l. higher returns and quality concerns. m. Non-standard supply chain structures. n. unstructured policies. **o. aligned business strategies, although not linked to operational strategy.** p. lower level of measurements used. q. clearly defined leadership except Surya. r. lack of aligned inter-organisational supply chain culture. s. adequate supply chain skills. t. lack of functional integration. u. inadequate use of business technologies.	The issues identified within transnational FMCG supply chains originating in India and South Africa were, but not limited to: a. increased product cost. **b. reduced supply chain service levels.** c. reduced supply chain flexibility. d. increased product lead time. e. increased inventory. f. unstructured policies. **g. unaligned business strategies.** .	Proposition was **partially supported**.

6.4 Steps taken by supply chain managers to deal with the issues confronting them

The steps supply chain managers were taking to deal with the issues confronting them, as identified in section 5, were compared and interpreted as follows.

Policies: One of the issues that supply chain managers were facing was that supply chain policies existed only for local supply chains in all four cases, but they were not mature enough to support and sustain international trade. Supply chain managers were focusing on setting up contracts with suppliers and customers to ensure reliability and responsiveness in the supply chain. They were also focusing on aligning policies with corporate strategies in order to leverage corporate initiatives. However, the idea of developing a standardised policy based on a standard supply chain framework had not been adopted, while the link between the supply chain strategy and the operational strategy was also missing.

Technology: It was found in all four cases that the supply chain managers were considering using advanced technologies to enhance visibility, to take better control over supply chain activities, to optimise supply chain costs and to improve staff morale (Kumar, 2009a). Supply chain managers at AVI had implemented an APS system to achieve supply chain efficiencies and were evaluating factory planning systems to improve production efficiencies (Connaughton, 2008). Supply chain managers at the other cases were still in the phase of evaluating APS systems. Dabur had implemented e-buying and e-payment systems in order to optimise its procurement and financial systems with overseas suppliers, and this helped supply chain managers to cut costs and strengthen relationships. At Amka,

supply chain managers were focusing on assessing the functionalities of the current ERP system and indentifying advanced functionalities that could be activated to improve supply chain control. It was also found that technology was required to create internal visibility in the supply chain and to improve staff morale. It was a surprising fact that none of the cases was using a product-tracing technology such as RFID (Rennie (ed.), 2009), as required by international regulatory bodies. Also, no case recognised the need to develop end-to-end supply chain visibility.

Marketing: It was found in all the cases that the firms' brand and selling strategies were not strong in overseas markets. The cases were focusing on developing an advertising strategy for overseas markets in order to improve on branding (Johnson, 2009). The fixed customer base made the international supply chain quite simple; however, the non-availability of customer- or market-related information made it quite difficult to penetrate the market further. As marketing was not considered to be a core supply chain function, the related area of understanding customers better in order to forecast their demands correctly and to control supply chain costs was not addressed adequately.

Integration and organisation: As identified in the literature review, SCM was a vast field that covered numerous operations/functions executed by many different people in the organisation. Supply chain managers were focusing on setting up planning functions around core supply chain functions such as S&OP and regular planning forums to integrate plans and outputs (Sheldon, 2009). The South African cases had implemented S&OP methodology and tools, while the Indian cases

were evaluating this methodology. Despite this, functional integration from a supply chain perspective was not achieved because all supply chain functions were not aligned towards a common supply chain goal. In addition, the cases were also evaluating the setting up of formal organisation structures for their overseas establishments that were aligned with their local structures.

Outsourcing: It was found that Amka and Dabur outsourced a portion of their manufacturing to overseas entities in order to reduce supply chain costs and improve flexibility (Kumar, 2002, 2004). In the packaged food cases, it was more difficult to outsource manufacturing because of strict quality and manufacturing guidelines. However, AVI had outsourced roughly 2% of its manufacturing.

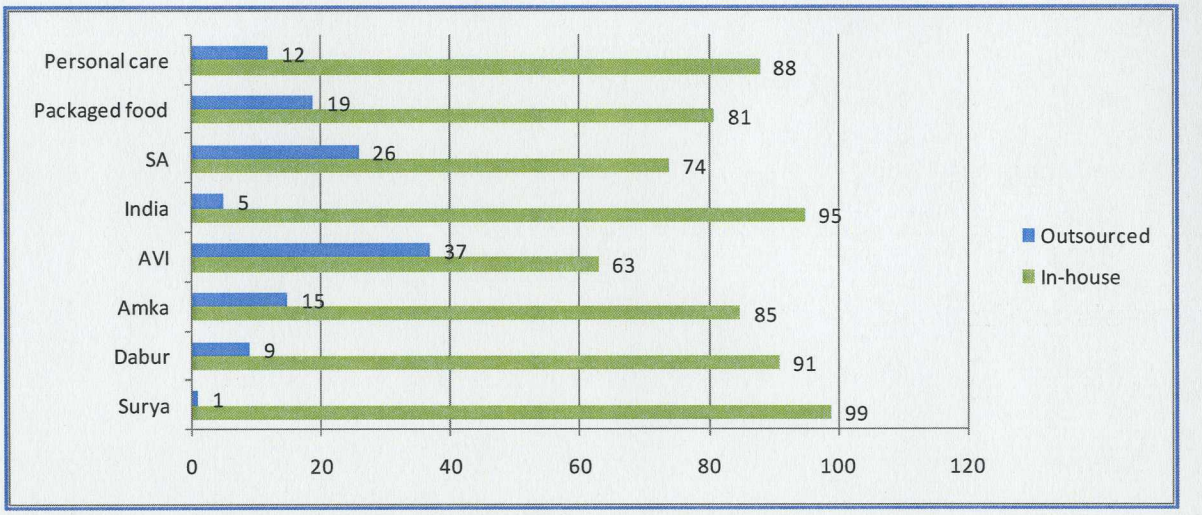

Figure 6-15: Outsourcing distribution for the cases

As can be seen from figure 6-15, the outsourcing of distribution was identified as a more common trend among the South African cases. Amka and AVI outsourced their distribution (which was considered a non-core operation) in order to focus on their core supply chain activities; however, the sole objective was to cut transport costs. Although the outsourcing of logistic activities to 3PL providers was

increasing globally, there were very few such organised service providers in India. This situation was further compounded by India's poor infrastructure facilities and the lack of trust between the various entities (similar to the Italian distribution setup). The personal care cases could make more use of outsourced distribution compared to the packaged food cases, because of the latter's regulatory constraints and specific transportation requirements. However, despite India and South Africa spending more of their GDPs on logistics than developed nations, the supply chain managers from both countries were faced with logistics challenges for years to come (Hausman, Lee & Subramanian, 2005). Also, an evaluation framework[111] to assist in selecting the outsourced service provider was neither used nor available.

Quality: It was found in all four cases that sales returns were an issue because products with lower-quality standards (compared with international standards) were being delivered to overseas customers. Supply chain managers were focusing on improving the quality of their products either by deploying stricter quality standards or outsourcing a portion of the manufacturing process to overseas entities that were more aligned to international standards (Parthasarathy, 2008). This objective was also coupled with that of improving brand image and exercising tighter cost controls. However, the cases had not adopted a framework that would permit them to understand the international regulatory laws and controls that applied to their operations.

[111] It included the criteria to measure operational, economical and social performances of the 3PL service provider.

Supply chain skills: The staff of all four cases had adequate supply chain skills; however, the gap lay in developing the skills that would allow them to understand the interrelationships of supply chain decisions and ownership of and commitment to a supply chain plan (SCC, 2008, APICS, 2009). Supply chain managers were focusing on improving the supply chain skills of their staff to international standards by providing supply chain courses and training, such as production management, APICS and SCC courses. However, there was no alignment of the organisational cultures of the cases with the supply chain mindset. This required a change of management approach, which the firms' supply chain managers had not yet adopted.

Service delivery: It was also evident from all four cases that one of the main reasons for higher sales returns was lower service levels due to delayed deliveries. All the cases except AVI experienced lower order fulfilment. Supply chain managers were identifying further ways of improving service delivery in order to improve brand image and further penetrate overseas markets. The vital trade-off decisions between inventory and service levels were not addressed properly, leading to suboptimal supply chain designs (Christopher, 2007). Appendix D9 presents the complexity involved with this trade-off decision.

Investment: In order to build up sustainable and growing supply chain systems, supply chain managers were assessing the areas of investment needed to improve their firms' asset bases and infrastructure. They were establishing DCs in overseas geographic areas closer to their customer bases in order to improve on service delivery. Amka and Surya were setting up new local factories to address

manufacturing requirements and production complexities. However, a network design[112] exercise to identify ideal operating locations had not been conducted.

Collaboration: The findings highlighted that collaboration (as per the CPFR model from Danese, 2006) among the supply chain entities (suppliers, partners, customers and service providers) was limited and the firms studied were not employing a suitable model. Figure 6-16 represents the integrated and extended supply chain collaboration model highlighting a possible opportunity for the cases to collaborate. Supply chain managers, however, were not developing plans to address these requirements (Dupre & Gruen, 2004).

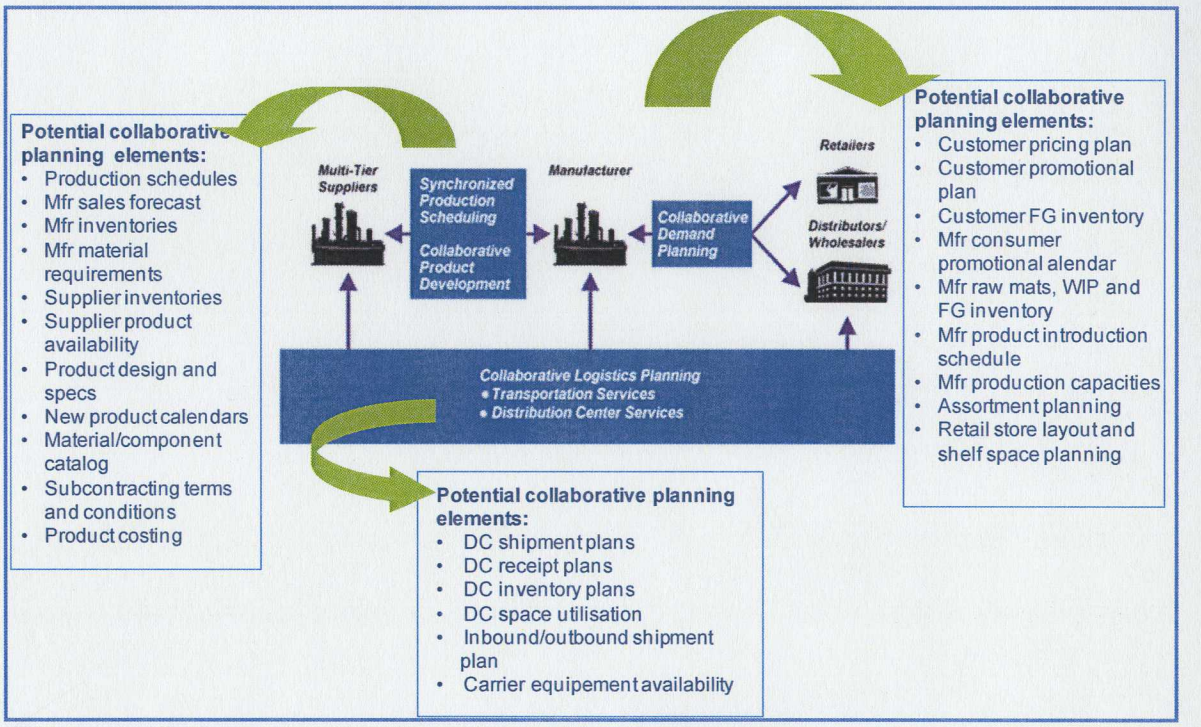

Figure 6-16: Opportunities for collaboration for the cases

[112] A network design included identification of locations of operations, such as sourcing, production, DC and customer servicing, based on factors, such as supply chain costs, lead times, inventory investment and efficiencies in the supply chain.

Best practices: The best practices employed by the supply chain managers also resulted in supply chain issues and risks. Table 6-3 presents a summary of the negative influence of some of the best practice models that they were using.

Best practice model	Perceived benefit	Issue/risks
LCCS	• lower material cost • lower labour cost	• longer lead times • increased chances of supply chain risks
Lean & JIT	• reduce inventory cost • eliminate waste	• increased chances of stock-outs in case of any disruption
Supply base rationalisation	• control supplier spend • improve strategic relationships	• increased risk of missed delivery with no back-up plan
Point solution such as demand forecasting	• improve forecasting • improve supply chain responsiveness	• increased burden on downstream operations to plan optimally at the same plan

Table 6-3: Issues with the best practice models

The issues/risks emanating from these best practices were not recognised and eventually not addressed by the firms under study, resulting in the suboptimal optimisation of their supply chains. Best practices were sometimes adopted by supply chain managers without a detailed assessment highlighting the related issues and risks, and this negatively impacted the performance of the supply chain.

6.4.1 Summary

These findings are summarised in the following table:

Finding	Proposition	Result
The steps that supply chain managers were taking to address the issues were as follows: a. developing policies aligned with corporate strategies. b. adopting newer and advanced technologies. c. focusing on marketing strategy for transnational markets. d. integrating and redesigning supply chain organisation hierarchy. e. focusing on core functions of the organisation and subcontracting the non-core functions. f. investing in better measurement controls for the product quality. g. investing in improving supply chain skills. h. focusing on ideas to improve service delivery. i. investing in infrastructure for longer lead time products. j. focusing on collaborating with their partners.	The supply chain managers were taking the following steps to address the issues with transnational FMCG supply chains originating in India and South Africa, but not limited to: a. adopting newer and advanced technologies. b. redesigning supply chain organisation hierarchy. c. investing in better measurement controls for the product quality. d. investing in additional inventory for longer lead time products. e. focusing on core functions of the organisation and subcontracting the non-core functions. .	Proposition was **supported**.

6.5 Other findings

The findings not covered in the previous categories were analysed to identify any further issues that the cases were facing or steps that supply chain managers were taking to deal with these issues.

Product range: It was found that the number of SKUs handled by the cases was between 200 and 600. Addressing sourcing, manufacturing and distribution requirements for this large set of SKUs was a challenging task for supply chain managers (David, Buckler, Mussomeli & Kinzler, 2005). The two options used by supply chain managers were the standardisation of raw materials (in order to reduce the cost of materials and sourcing activities) and the standardisation of the product portfolio (in order to contain product proliferation).

Low-cost country sourcing: The LCCS model identified the options of reducing material costs by identifying geographic areas with low production costs. The SEA region was identified in the literature review as one of the options for LCCS, while another option was South America. However, in 2009, this model was no longer effective because of increased fuel and logistics costs, which nullified the savings obtained from lower material costs (Morgenstern, 2006, Kumar & Bala, 2009). Amka had transferred 95 percent of its supplier base to local markets in order to contain the final landed costs of materials and to shorten the lead times.

Financial accounting system: It was evident from the research that supply chain managers faced the challenge presented by the different accounting standards used by their firms and their suppliers/customers (Needles, Powers & Crosson,

2008). The definitions of line items on the chart of accounts were also not similar among partners, leading to ambiguity and errors in recording transactions, which resulted in delayed payments and grievances. The financial chart of accounts was not similar in all four cases.

Foreign exchange: It was evident from the research that foreign exchange cover was a critical issue. All four cases used the availability of forward cover; however, because the economic downturn had resulted in highly volatile currency rates, all the cases faced sudden financial losses that could wipe out their profits from transnational markets. The top management of the Indian cases were liaising with the federal government to establish a monitoring system for forex control.

Bullwhip effect: The bullwhip effect, a common FMCG phenomenon (Sahay, Gupta & Mohan, 2006), was noticed in local supply chains, due to order batching and demand projections upstream, and it resulted in increased variability. Figure 6-17 shows a common bullwhip phenomenon.

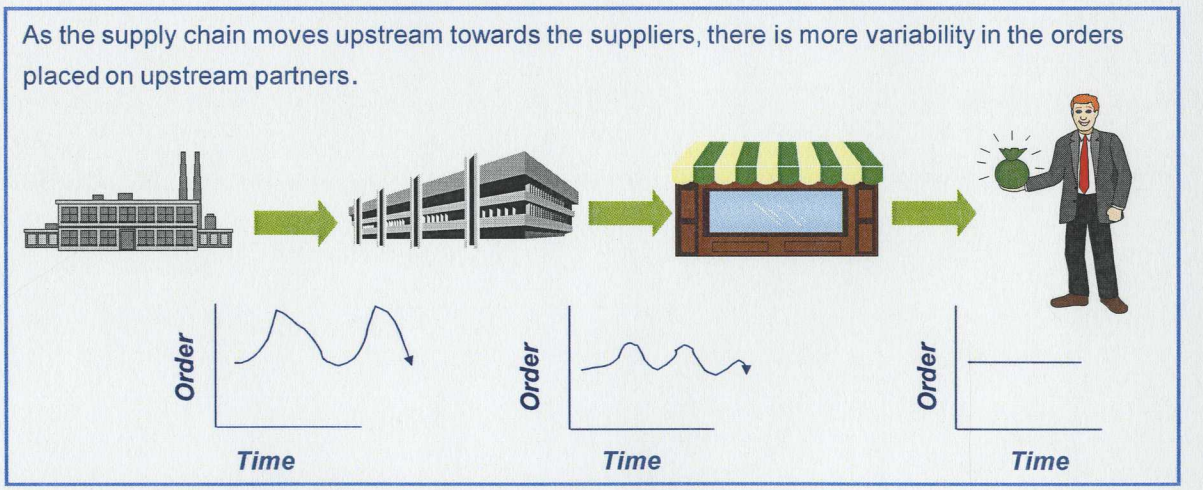

Figure 6-17: Bullwhip effect in local supply chains

However, this effect was not evident in the cases' transnational supply chains. As customer orders were directly received by the planning function on behalf of the manufacturing operation, the activities of order batching and demand projections did not occur.

6.6 Proposed framework of supply chain operating model

Based on the findings and the gaps analysed, when compared with the standard models (such as SCOR and the best practices), a need for a supply chain operating model was identified to address the issues faced by these cases. The proposed supply chain operating model was required to maintain the existing common typology identified among the cases, and to further evolve from the cases' leading setups such as use of information technology and central planning structures.

It was rather difficult to come up with a supply chain operating model that was applicable to all the four cases. However, considering the common issues identified among the cases, an approach to design the framework of such a model was seen as a possibility. That approach was further made possible by a common typology that existed among the cases. This thesis focussed only on designing the framework for the proposed supply chain operating model, however to develop and test validity of such a model was seen as a future research activity.

The design principles for the proposed supply chain operating model were identified, as following, as that:

a. It supported the corporate and supply chain strategy.
b. It was simple (in design and setup) to be easily understood and potentially implemented by the cases.
c. It encapsulated end-to-end supply chain setups and functions.
d. It highlighted potential opportunities to improve the supply chain effectiveness and efficiencies.

e. It addressed the operational, financial and governance issues identified in this research.

In addition, another need identified was that the supply chain operating model resolved the current issues in order to obtain quick gain, and further relate to the firms' future business strategies.

The proposed supply chain operating model reflected the firm's supply chain strategy, which in turn was evolved from business strategy. The components of the proposed supply chain operating model are discussed in the following sub-sections.

6.6.1 Supply chain strategy

By the virtue of the nature of the industry these cases belonged to, a common supply chain strategy was not fully applicable to address all the supply chain scenarios of these cases.

The underlying strategy proposed for transnational supply chain was MTO, with MTS to consume the balance production capacity. In addition, two fundamental supply chain strategies were proposed to be deployed - "functional" for slowing and medium paced products and "innovative" for fast paced products. Products classification was required between these two supply chain strategies, and a three to five years periodical review was setup.

6.6.2 Supply chain elements

A layered architectural framework was suggested to design the elements of the proposed supply chain operating model. The following elements were required to be addressed:

- Which **customers** should the firm service?
- What **channels** should the firm use?
- What **products** and **services** should the firm offer?
- What **processes** should the firm deploy?
- What **information** should the firm use?
- What enabling **technologies** should the firm use?
- What **organisation** structure should the firm deploy?
- What **resources** and **skills** should the firm use?
- What **locations** should the firm use?

In addition, the inter-linkages between these above elements were critical for an integral design of the framework. Figure 6-18 shows these elements and their inter-linkages.

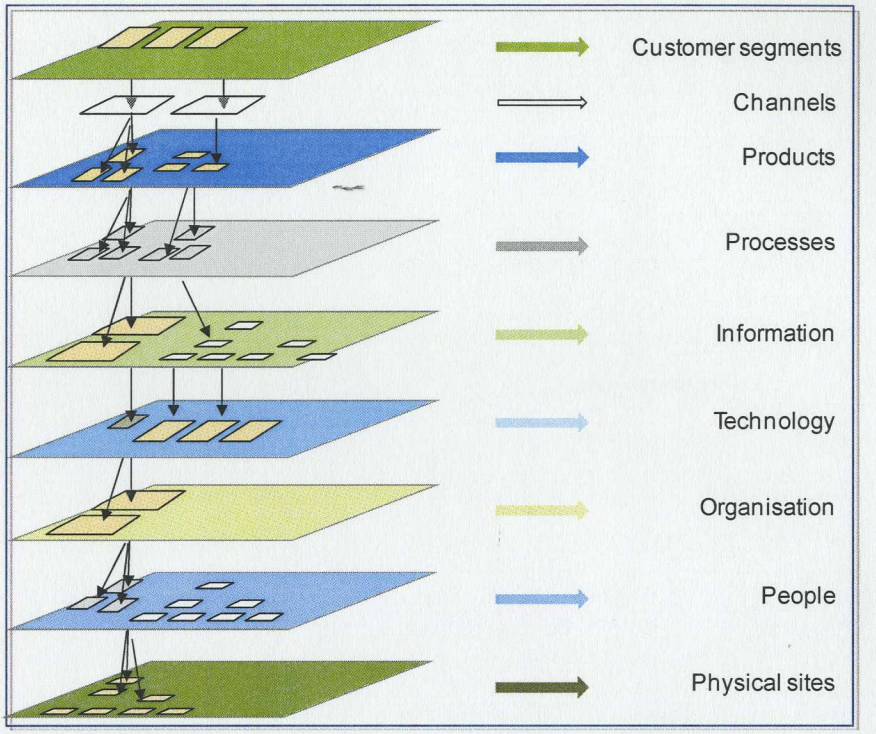

Figure 6-18: Elements of the proposed supply chain operating model

The above elements of the proposed supply chain operating model were based on the analytical models used in this thesis – operational, financial and governance. These elements are further described below:

Customer segments: The segmentation of customer (based on parameters such as volume, profitability and lead times) according to supply chain strategy was proposed to be conducted to develop a service level oriented environment. In certain scenarios, nominated delivery days (the concept which was very common in local supply chains) was used to distinguish among the customer segments.

Channels: Channels defined the approach or route to the market. Different modes of transport were proposed; however a combination of inland road and overseas ship transport modes was preferred. Channels also defined the impact of the mode of transport on lead times and corresponding inventory levels.

Products: Two supply chains were proposed to deal with two different product categories - slow/medium paced and fast paced products. Two different inventory profiling strategies were proposed for these two product categories. The consolidated inventories for slow/medium paced products were suggested to be kept at a centralised DC, whereas the inventories for fast paced products were preferred to be kept near to the customer locations. The proposed fulfilment policy also differed – weekly to monthly replenishment for slow/medium paced products and daily to weekly for fast paced products.

Processes: A processes framework based on SCOR model was proposed. All the four cases used all the process categories and elements of the SCOR model; however, "return" process was sparingly used. In the context of a green and risk-free supply chain model, the framework suggested that the cases used the return process to its full extent.

Information: The model proposed to use the real time and historical information to enable the cases to make right and accurate decision. Three to five years of historical transactional data and related financial information was suggested. Information in its raw form was requested so as to massage the information as required by the individual cases. The KPIs (operational and financial) as identified per the SCOR and the financial model were proposed.

Technology: With right information available at hand, advanced technologies were proposed as basic ERP was available with most of the cases. APS tools such demand forecasting, inventory planning, distribution planning and factory

planning were proposed. These technologies were proposed to be interface with the existing ERP applications, with customer facing solutions such as PoS and with supplier facing applications such as EDI.

Organisation: A centre led model was proposed to govern the supply chain organisation structure. Due to the diverse nature of the businesses the cases were involved with, a fully centralised model was not suggested. A model where guidance and support was provided by the central/head office seemed to be a better fit, hence centre-led model was suggested. This model also suggested that the policies and governance were controlled by the central office, whereas the implementation and execution were responsibility of the regional offices.

People: Resources with basic supply chain skills (in the areas such as transport, warehousing, distribution and returns) were proposed to be deployed in the supply chain operations. However, advanced supply chain skills in the areas such as demand planning, network design and supplier relationships were proposed to carry out the central activities.

Physical sites: At the end, physical operating sites were proposed to be identified with due considerations of taxes, lead times to suppliers and customers, storage facilities and supporting amenities such as public transport, electricity and water. A centralised distribution centre was proposed that was geographically central to all manufacturing setup (within accepted lead times), and also accessible to the rail mode of transport. A storage facility close to the shipyard was also proposed to hold the transit inventory.