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

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2.1 Supply chain

This section focused on the literature that analysed the term "supply chain". The concept of a "supply chain" was explored in terms of its definition, components, role in an organisation, organisational structure and costs.

2.1.1 Definition

Several definitions of a supply chain were available in the literature. Most authors agreed that a supply chain could be defined in terms of many facets, i.e. (solely or as a combination of two or more aspects) material flow, information flow, entities involved, monetary flow, objective/goal, role in an organisation, geography and organisational structure. These facets are explored further later in this section.

The term "supply chain management" (SCM) was first time used in the 1940s (Stadtler & Kilger (eds.), 2007). Table 2-1 presents a list of initial definitions, from the 1980s and 1990s, of the term "supply chain" as identified in the literature.

Author	Definition
Jones & Riley (1985)	Total flow of materials from suppliers through end users.
Christopher (1986)	Series of activities and organisations that materials move through on their journey from initial suppliers to final customers.
Stevens (1989)	The connected series of activities, concerned with planning, co-ordinating and controlling material, parts and finished goods from supplier to customer.
Cooper & Ellram (1993)	Total flow of distribution from supplier to the ultimate customer.
La Londe & Masters (1994)	A set of firms that passes material forward.
Fisher (1997)	Supply predictable demand efficiently at the lowest possible cost.
Lambert, Stock & Ellram (1998)	Alignment of firms that brings products and services to market.
Monczka, Trent & Handfield (1998)	Integrate and manage the sourcing, flow and control of materials using a total systems perspective across multiple functions and multiple tiers of suppliers.

Table 2-1: Initial definitions of supply chain

As can be seen from the above table, the earlier definitions found a supply chain to be unidirectional (supplier to customer) and considered only its tangible elements (material movement).

One of the most used definitions of a supply chain was given by Christopher (2005:15), who defined it as: "a network of organizations that were involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of ultimate customer." This definition was a step up from the previous definitions, as it indicated that supply chains were bi-directional (upstream/downstream), managed processes and organisations.[14] The focus, however, was still on managing customer expectations and internal processes.

A supply chain was also defined by Investorwords (2007:1) as "the network of retailers, distributors, transporters, storage facilities and suppliers that participate in the sale, delivery and production of a particular product." This definition was aligned with the previous definition, suggesting the involvement of external organisations in a supply chain.

Two supply chain bodies considered supply chain activities in order to define the term "supply chain". The first was the Association for Operations Management (APICS). Blackstone (ed.) (2008:134) defined a supply chain as "the global network used to deliver products and services from raw materials to end

[14] The organisations included manufacturer, logistics service providers and customers (Christopher, 2005).

customers through an engineered flow of information, physical distribution, and cash."

A second, similar body, the Supply Chain Council (SCC) (2008), defined supply chain activities as all customer interactions, from the order entry through to paid invoice; all products (physical, material or service) from the supplier's supplier to the customer's customer; and all market interactions, from the understanding of the aggregate demand to the fulfilment of each order.

The above two definitions saw a supply chain as a global phenomenon (global network) and focused further on its processes, which concerned both suppliers and customers. This also indicated that the monetary aspect[15] should also be considered to be part of a supply chain.

Mentzer, DeWitt, Keebler, Min, Nix & Smith *et al* (2001:5) defined three levels of supply chains, as shown in Table 2-2.

Level	Definition
Basic supply chain	a supply chain is a set of three or more firms directly linked by one or more of the upstream and downstream flows of products, services, finances, and information from a source to a customer.
Extended supply chain	an extended supply chain includes suppliers of the immediate supplier and customers of the immediate customer, all linked by one or more of the upstream and downstream flows of products, services, finances, and information.
Ultimate supply chain	an ultimate supply chain includes all the firms involved in the upstream and downstream flows of products, services, finances, and information flow from the initial suppliers to the ultimate customer.

Table 2-2: Three levels of supply chain
Source: Adapted from Mentzer, DeWitt, Keebler, Min, Nix & Smith *et al* (2001:5)

[15] Cash flow was considered as one of the key performance indicators and a success factor for the supply chains (SCC, 2008).

These definitions added another dimension to the concept of a supply chain. The progression of the supply chain from the "basic" to the "ultimate" level indicated that a difference existed among the various supply chains with respect to their maturity levels.[16]

The term "supply chain" was also applied to a large firm with several sites often located in different countries with a supply network that was defined as a "transnational supply chain". Stadtler & Kilger (eds.) (2007), from a supply chain perspective, identified co-ordinating information and material flows for such a multinational firm in an efficient manner as the key to success for competing supply chains. This brought yet another dimension to the concept of a supply chain, indicating that supply chains (not businesses) compete with one another. The aspect of competing supply chains was studied in further detail later in this thesis.

Despite the popular usage of the term "supply chain" both in practice and academia, a clear definition for the term could not be obtained. As can be seen from the definitions discussed above, the term "supply chain" was interpreted as having different meanings according to its different usages and applications. For research purposes, this thesis used the following definition of the term "supply chain":

[16] The aim of supply chains was identified to achieve the ultimate level status by linking all the supply chain entities (including the ones external to the organisation) involved with such activities as procurement, transport, receiving, warehousing, inventory management, materials handling, order processing, distribution, recycling, information processing and payment.

"The linkage of strategic, tactical and operational activities dealing with the flow of goods, information, money and services between the supplier's supplier and the customer's customer for an organisation."

The above definition focused on the elements of activities (across planning levels)[17] and the various kinds of flow possible and linked all the different entities involved (suppliers, customers and the organisation).

It was also clear that the term "supply chain" could not be defined adequately unless it was analysed at a lower level. All the components of a supply chain needed to be understood in order to define the term comprehensively.

2.1.2 Components

Stevens (1989) identified the need for an integrated supply chain (hence integrated components), which he saw as a connected series of activities concerned with planning, controlling and co-ordinating materials, parts and finished goods from supplier to customer in order to achieve organisational success. Stadtler & Kilger (eds.) (2007) identified a supply chain as the seamless information and material flow among three different entities; the customer, the manufacturer and the supplier. Figure 2-2 depicts these components of the supply chain.

[17] The planning levels are discussed in section "2.2.2 – FMCG supply chains".

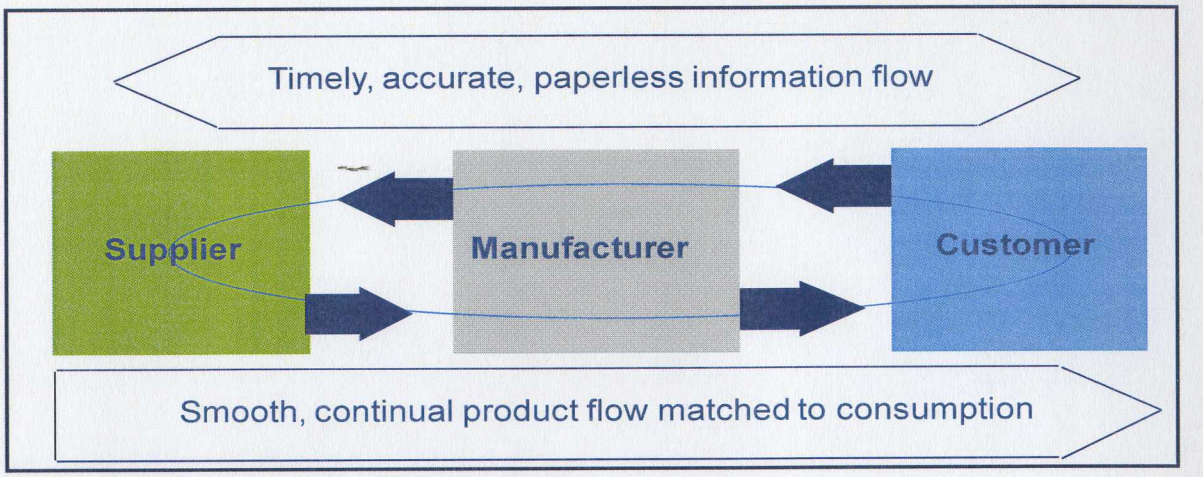

Figure 2-2: Components of supply chain
Source: Adapted from Stadtler & Kilger (eds.) (2007:25)

The flow (material and information), physical entities (suppliers, manufacturers and customers) and extended model (third-party logistics, management parties, financial houses, policy departments and government regulations) were the key components constituting a supply chain.

The supply chain was studied (for analysis and management) by categorising it into the following functional components, as identified by Saxton (2006:30) and SCC (2008):

a. planning: an end-to-end planning cycle to manage resources
b. sourcing: choosing suppliers, the buying function and evaluation
c. making: the manufacturing of products
d. delivering: the warehousing and transportation of finished products
e. returning: excess and defective products received back from customers.

As discussed above, most of the authors identified the components[18] of the supply chain as:

"The supplier, the manufacturer (the organisation) and the customer."

For research purposes, this thesis used the above basic components of the supply chain and the following business functions of the supply chain:

"Planning, sourcing, making, delivering and returning."

Once the term "supply chain" was defined and its components identified, it was necessary to understand its role in an organisation.

2.1.3 Role of a supply chain

Drucker (1964) emphasised the importance of physical distribution (i.e. the supply chain) and stated that it was always a central and essential feature of all economic activities. Shapiro & Heskett (1985) agreed with this and pointed out that there were only a few aspects of human activity that did not ultimately depend on the flow of goods from point of origin to point of consumption. Seifert (2003) spoke about utilising a supply chain as the backbone needed to create competitive advantage on a global platform. Poirier & Quinn (2003) stated that 98 percent of firms considered SCM to be either critical or very important.

Goldratt & Cox (2004) stated that fulfilling the aim of organisations – to make money – enabled them to thrive in competing economies. Supply chains provided

[18] The extended supply chain model included such additional components as "supplier's supplier" and "customer's customer". Those were represented in the model by the components "supplier' and "customer" respectively.

a platform for organisations to reach their goals by aligning and optimising various value-adding tasks such as production, sourcing and distribution. Furthermore, an organisation's goals were achieved by eliminating non-value-adding tasks such as unnecessary transportation.

Christopher (2005) also confirmed supply chains as the backbones of organisations. He stated that firms used to compete in the past; however, in future, chains linking all the components together will compete. The focus has moved from a reactive cost perspective to a proactive performance perspective. Figure 2-3 represents the difference between the past and the future of the competing economy.

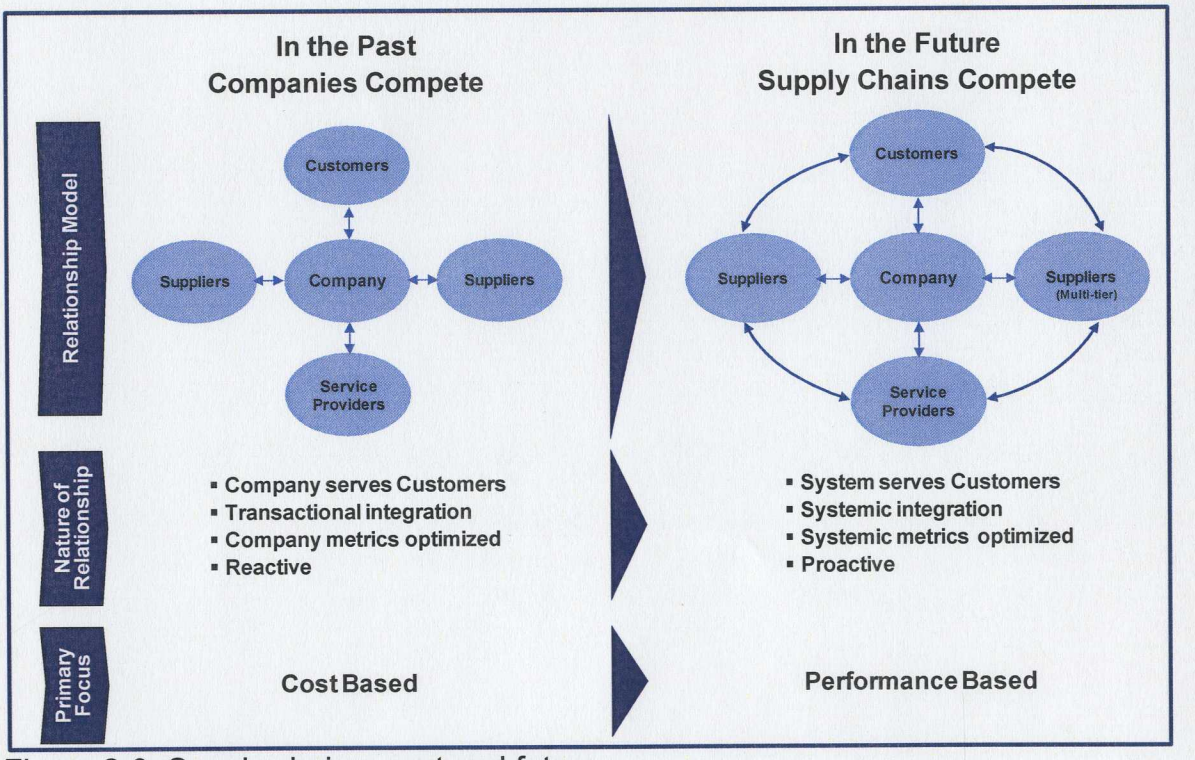

Figure 2-3: Supply chains: past and future
Source: Adapted from Christopher (2005:37)

Supply chains also aligned themselves to support an organisational goal. The goal of a supply chain was competitiveness or, ultimately, customer service (Sahay,

Gupta & Mohan, 2006). In order to increase competitiveness, organisations procured low-cost raw materials, improved product quality, and reduced product and delivery lead time. These objectives forced an organisation to identify low-cost suppliers, low-cost manufacturing facilities, close-proximity distribution facilities and larger customer bases. Fassoula (2006:849) stated that, "the supply chain process is a core business process of major importance for the realisation of business strategy."

This indicated that the supply chain was the best platform on which to base an organisation's transformation process, linked to its business strategy.

Hence, as identified above, the key objective of a supply chain was to achieve the organisational goal by balancing various components and addressing the issues raised by conflicting goals and objectives from the various business silos.[19] In essence, supply chains were the focus for the competing economies. For research purposes, this thesis defined the role (goal) of the supply chain as being:

"To gain sustainable competitive advantage for an organisation."

2.1.4 Supply chain organisational structure

The supply chain organisational structure was identified as a critical component in achieving supply chain effectiveness and efficiencies. According to Armstrong, Enright, Lempres & Rauch (1996), the organisations of the FMCG industry were considered to be organisational role models for other industries, since they had developed several innovations in marketing and management. However, changes

[19] "Business silo" referred to unconnected internal functions of an organisation which aimed to achieve their individual functional goals (Hammer, 1996).

in the business sector and related developments made business poor for these organisations.

According to Dorling, Scott & Deakins (2005), the success of the organisational-level framework and strategic supply chain relationships was based on eight key factors. The factors for a vendor managed inventory (VMI) model, such as a shared vision, a win-win attitude, openness, trust, integrity, respect and confidentiality, were of relative high importance for the organisation and its suppliers.

Christopher (2005) stated that evolving supply chain relationships were transforming how firms were structured in order to efficiently compete in the global marketplace. He indicated that manufacturers of consumer products must understand that their distributors and retailers were important players in influencing shareholder value. Brand- and function-based approaches must be shifted to a categories-based strategy focusing on a few core processes[20] (Schrage, 2004).

The corresponding organisational framework for these strategies was further explained by Deloitte (2008), which highlighted the need for the supply chain organisational structure to assist in achieving the firm's objectives, given the firm's unique network and challenges. Table 2-3 gives the criteria for designing a range of supply chain organisational structures, with their respective advantages and disadvantages.

[20] Brand-based function referred to a silo-based structure, while category-based strategy referred to a collaborative structure.

Objective	Organisational structure	Description
Cost focus	**Functional**	• **Organisation:** Functional expertise • **Pro:** Efficient given economies of scale and cost controls • **Con:** Limited cross-functionality
Customer focus	**Process centered**	• **Organisation:** Linked, end to end processes • **Pro:** Customer focused, quick and productive, not costly, team oriented • **Con:** Decentralised, difficult to maintain technical excellence
Speed focus	**Product or Geographical**	• **Organisation:** By product category or geography • **Pro & Con:** Product structure responsive to changes in customer requirements. Difficult to achieve synergies between product categories • **Pro & Con:** Geographical structure responsive to geographic demand. Difficult to achieve global business strategy
Flexibility focus		
Blended focus	**Matrix**	• **Organisation:** Multiple and overlapping reporting relationships between product, geography or function • **Pro:** May provide simultaneous attention to geography, function and product • **Con:** Complex and often difficult to manage due to multiple reporting relationships

Table 2-3: Supply chain organisational structure
Source: Deloitte (2008:12)

FMCG organisations used a mix of these organisational structures based on the maturity level of a particular organisation. The design of a particular organisational structure was also based on an organisation's size and its global footprint.

2.1.5 Supply chain costs

As has been identified in the previous sections, supply chains handle numerous internal and external activities. These activities were perceived to be expensive, but few organisations could say precisely how expensive.[21] Ray (1975) noted that the whole area of supply chain costing was clouded with ad hoc approaches and untidy accounting procedures, and there appeared to be little systematic underlying ideology. Hertz (2006) and Kosior & Strong (2006) agreed, saying that

[21] "Expensive" referred to the cost of the (supply chains) activities.

identifying logistics costs through accepted accounting statements in the firm was very misleading.

Managers started to identify the "total cost" of supply chain, as noted in the references from the 1980s. Ray, Gattorna & Allen (1980), Firth (ed.) (1981), McKibbin (1982) and Delaney (1986) mentioned that a supply chain generally accounted for 15 to 20 percent of the total costs of an organisation. Anderson & Dekker (2009) supported this notion. However, many distributors were unaware of the costs of the distribution service they provided.

Obtaining a true sense of supply chain costs was identified as crucial in order to measure and benchmark the performance of the supply chain. The formula used by Kumar (2009a) gave a representation of the true (total) supply chain cost (TSCC) (see figure 2-4).

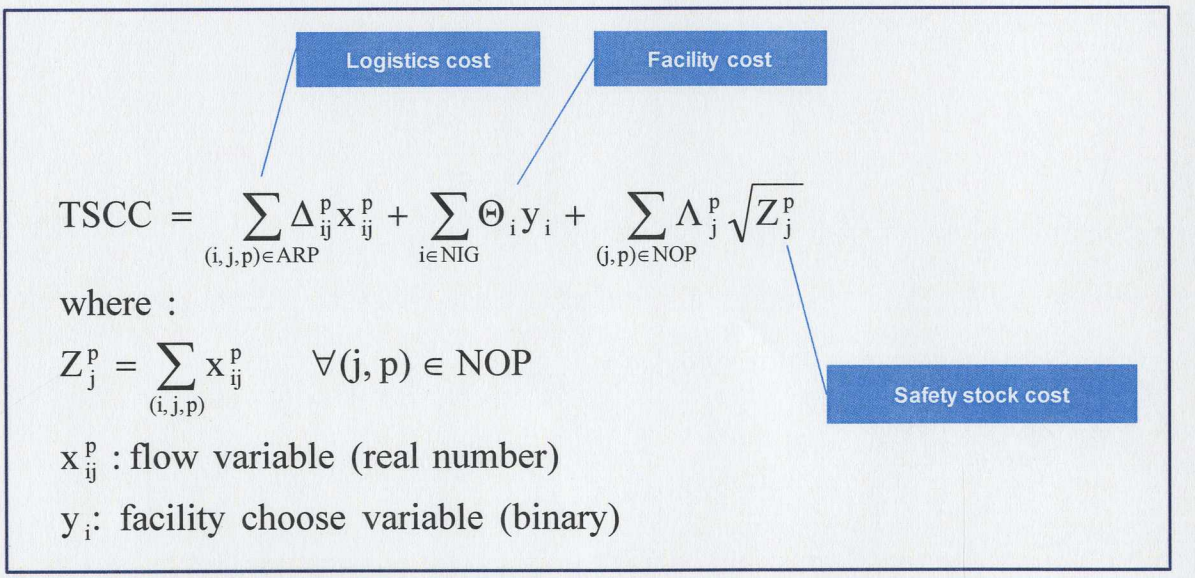

Figure 2-4: Total supply chain cost calculation
Source: Kumar (2009a:21)

The above equation represented supply chain costs in terms of logistics, facility and safety stock (inventory) costs. In a simple form, the above equation could be seen in terms of detailed fixed and variable cost elements, as follows:

$$TSCC = SC + FMC + VMC + FFOC + VFOC + WC + CIC + PIC + ICOC + TC$$

Where:	SC	= Supply Cost
	FMC	= Fixed Manufacturing Cost
	VMC	= Variable Manufacturing Cost
	FFOC	= Fixed Facility Operating Cost
	VFOC	= Variable Facility Operating Cost
	WC	= Warehousing Cost
	CIC	= Cycle Inventory Cost
	PIC	= Pipeline Inventory Cost
	ICOC	= Inventory Carry Over Cost
	TC	= Transportation Cost

Figure 2-5: Total supply chain cost calculation (simple form)
Source: Kumar (2009a:22)

2.2 Fast-moving consumer goods industry

The FMCG industry was explored in terms of its characteristics, its supply chains, its difference from other industries and its key products segments.

2.2.1 Characteristics

The FMCG/consumer durable industry included all firms that manufactured products that were distributed via high street retailers. Figure 2-6 shows some of the established FMCG firms.



Figure 2-6: Leading fast-moving consumer goods firms (worldwide)

The Confederation of Indian Industry (CII) (2005) identified the FMCG industry as the largest industry in the world. It supplied non-durable consumer goods and catered to the everyday needs of consumers. The characteristics of its products were unique to the industry as they were non-durable, branded, packaged and consumed every month directly by the end consumer. The main segments of the FMCG industry were personal care, packaged food and beverages, household care, and spirits and tobacco.[22]

CII (2005) published a strength, weakness, opportunity and threat (SWOT) analysis for the FMCG industry, identifying well co-ordinated distribution networks

[22] These segments encompassed products such as food, drinks, tobacco, cosmetics, clothes, toys, white goods and brown goods, with low cost and quick shelf turnover.

as its strength and outsourcing as an opportunity. However, low-technology initiatives were a weakness, and irregular tax structures, international regulations and imports were a threat to the industry. It was stated that organisations not addressing these issues before going transnational faced tough hurdles in their attempts to achieve competitiveness. CII (2005) recommended the FMCG industry to concentrate on supply chain management and lowering costs for positive growth.

A Deloitte report (2009a) found that the packaged food organisation industry was faced with a volatile environment, as concerns regarding food safety, traceability, retailer power and international regulations were becoming prominent. Consolidation in the industry coupled with changing customer demand put pressure on the organisations involved to search for new ways to cut costs and improve margins by increasing asset efficiency and managing food safety risks.

Another Deloitte report (2007) stated that, in order to increase profitability growth, a FMCG firm was required to improve its operational efficiency by deploying initiatives to optimise its supply chain efficiency.[23] Sheldon (2009) supported the notion of the FMCG industry using collaborative planning such as sales and operations planning (S&OP) to create distribution-intensive systems.

[23] The initiatives identified were establishing planning including sales and operations planning process, implementing demand pull process, adopting lean philosophy, maximising supply chain integrity and safety, optimising supply chain network and developing tax optimised supply chains.

However, in the 1980s, retailers started dominating the industry with their control over the downstream supply chain functions.[24] Retailers also created pressure backwards on the FMCG organisations to cut costs, and to improve service deliveries and lead times. Figure 2-7 shows some of these established retailers.



Figure 2-7: Leading retail firms (worldwide)

Sales and marketing were not part of the core supply chain functions in the FMCG industry. However, the brands of the organisation played a big role in influencing its supply chain. Desai (2008) stated that the trouble with FMCG brands was that that they were rooted in the assumptions of the 20th century. He also stated that the assumption that the powerful brands could be built worldwide merely by offering a good-quality product with the help of positioning was not really true. He suggested the use of technology (the Internet) to create sustainable brands, thereby reshaping supply chain activities and aligning the supply chain to brand value.

In addition to branding, the FMCG industry should take the value propositions of its products into consideration. Johnson (2009) stated that while consumers scrutinise prices, they also consider the value propositions of the products. They further stated that in the long term, in mature markets, main-stream brands will decline; hence, a stronger value proposition was required to sustain strong growth.

[24] The functions handled by retailers were shelving, retail sales, credit terms, customer feedback and returns etc.

However, some managers rejected this idea, stating that FMCG brands hold a unique position and that bringing new brands to the market to add value to their key brands may confuse customers into thinking that their main brands were overpriced to start with. However, Johnson (2009) felt that in the longer run, the value proposition will play a substantial role in defining the brand and its success in the marketplace.

For research purposes, this thesis analysed the FMCG industry in terms of a:

"High velocity and agile industry focused on producing and selling branded goods consumed daily by consumers."[25]

2.2.2 Fast-moving consumer goods supply chains

The supply chain functions of an FMCG firm encapsulated all the end-to-end business functions of an organisation, such as buying, making, moving, storing and selling,[26] as shown in figure 2-8.

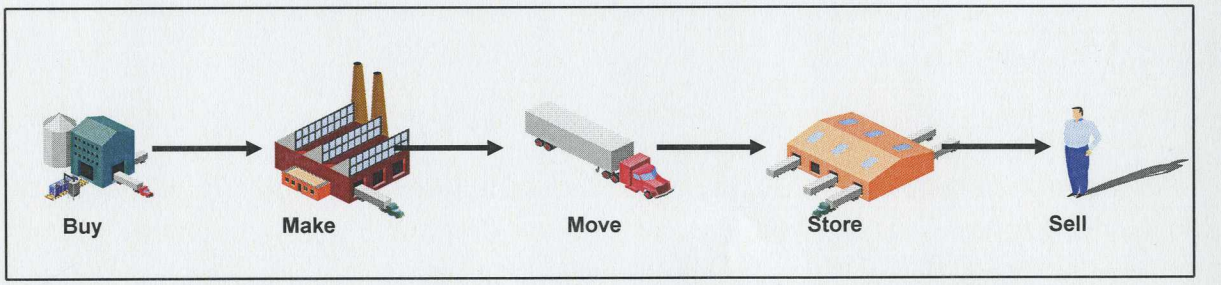

Figure 2-8: Supply chain functions of a fast-moving consumer goods firm
Source: Kumar (2002:99)

[25] As identified earlier, "sell" was not a core FMCG supply chains' function and controlled mostly by retailers. However, it was still included in the characteristics of FMCG industry because it impacted other supply chain functions.
[26] See Kumar (2002) for details on these functions.

The FMCG industry, with its own unique set of characteristics and attributes, was governed by the constraints and interfaces among these internal functions. Similar constraints were identified among the components of the supply chain. Kumar (2002, 2004) stated that buying and selling were the key functions of FMCG organisations; while making, moving and storing were less important functions that were normally outsourced.

Kumar (2009a) described the functions of a general FMCG organisation across the supply chain landscape. Figure 2-9 shows these functions in terms of activities as they occur.

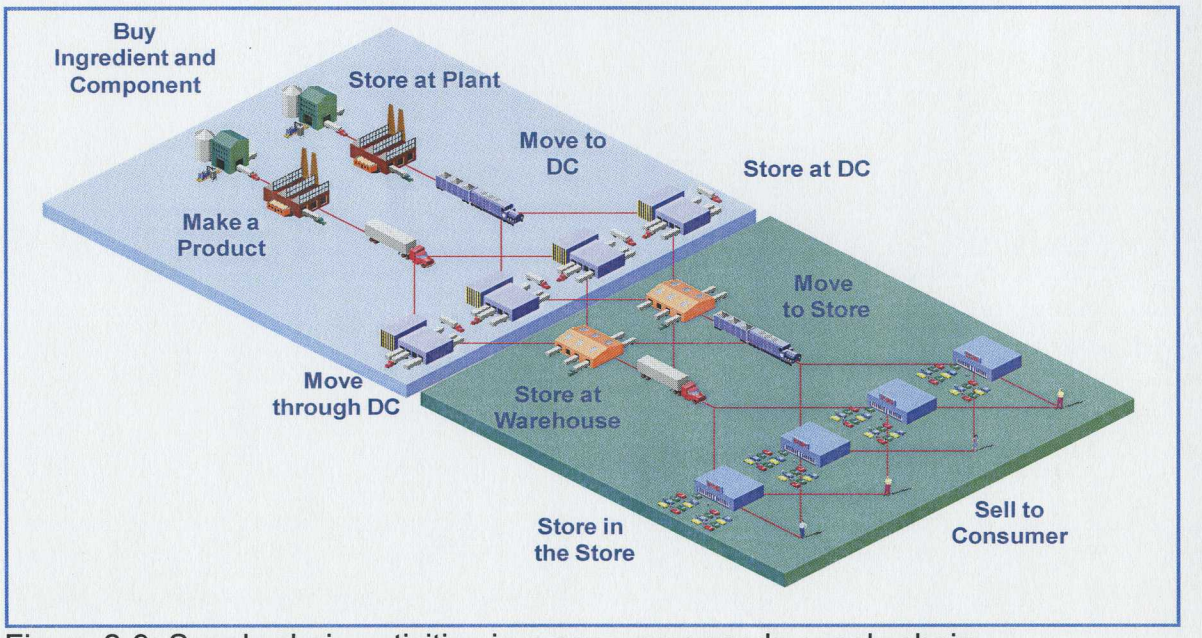

Figure 2-9: Supply chain activities in a consumer goods supply chain
Source: Kumar (2009a:8)

The above figure showed that FMCG industry supply chains represented a structure of simple manufacturing processes, but complex distribution networks. This thesis, therefore, was inevitably more focused on identifying issues within distribution networks.

Battezzati & Magnani (2000) defined components of the FMCG supply chains:[27]

- the basic supply chain definition of operational activities with its suppliers and third parties
- the design functions, focusing on the adjustment of the offer to the variability of market demands
- the different components of the FMCG industry, via the distributive channel, through to the final consumer/user.

i2 Technologies (2008) defined the relationship between the supply chain functions and the planning elements for a FMCG supply chain with reference to strategic, tactical, operational and scheduling levels. These levels referred to different planning time frames and horizons across the business functions. The relationships involved the various supply chain activities linked to the supply chain function. This thesis was focused on all the supply chain activities across all the functions, together with the planning dimensions of these activities (figure 2-10).

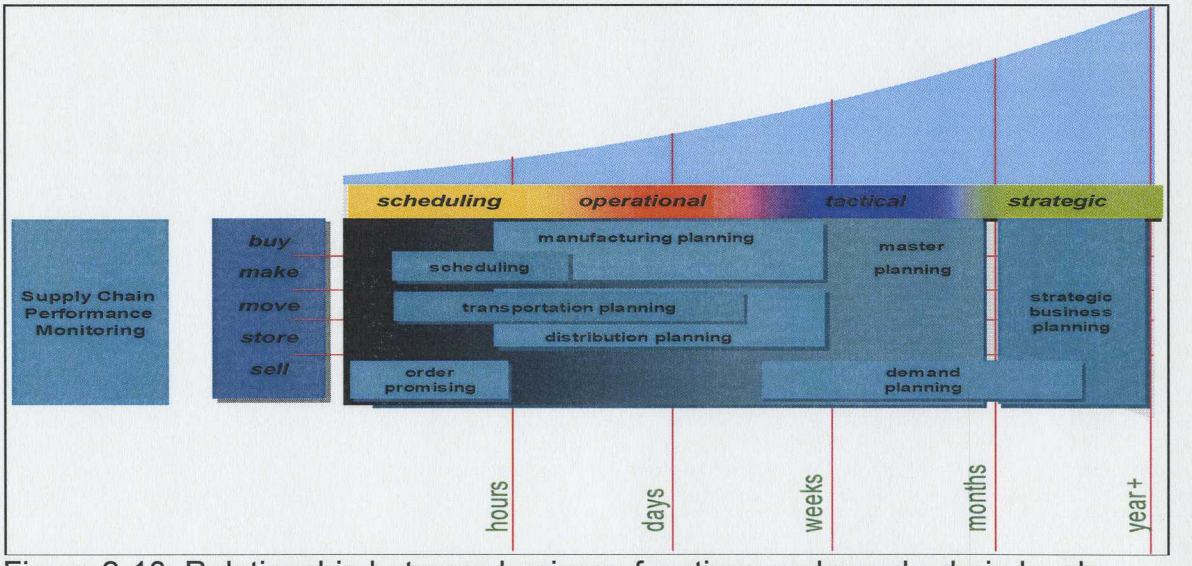

Figure 2-10: Relationship between business functions and supply chain levels
Source: i2 Technologies (2008:1)

[27] They identified the components based on the designs of Italian supply chains.

2.2.3 Typology and challenges of fast-moving consumer goods supply chains

The typology[28] in terms of the functional and the structural attributes[29] highlighted the complexities of FMCG supply chains. This is explained in table 2-4.

Functional attributes	
Attributes	**Contents**
Products procured	Standard (raw material) and specific (packaging material)
Sourcing type	Multiple (raw material) Single/double (packaging materials)
Organisation of the production process	Flow line
Repetition of operations	Batch production
Distribution structure	Three to four stages
Pattern of delivery	Dynamic
Deployment of transportation	Unlimited routes (3rd stage)
Loading restrictions	Chilled and frozen transports
Relation to customers	Stable
Availability of future demands	Forecasted
Products life cycle	Several years
Products sold	Standard
Portion of service operations	Tangible goods
Structural attributes	
Attributes	**Contents**
Network structure	Mixture
Degree of globalisation	World wide
Location of decoupling points	Deliver-to-order
Legal position	Intra-organisational
Direction of coordination	Mixture
Type of information exchanged	Forecasts and orders

Table 2-4: Typology for fast-moving consumer goods supply chain
Source: Stadtler & Kilger (Eds.) (2007:256)

Table 2-4 also confirms that FMCG supply chains used complex distribution networks. It was also established that FMCG organisations could use many different combinations for the buying function, but that this freedom could raise concerns among supply chain executives. Another two important aspects identified were the types of products involved (including their life cycle and shelf

[28] Typology was defined as classification according to general type (Allen (ed.), 1990).
[29] Functional attributes referred to the configuration of the internal supply chain activities, while the structural attributes referred to the interfaces with the external supply chain entities.

life) and the sharing of information among the various supply chain entities. This research study also analysed these features of FMCG supply chains.

The role of the supply chain as identified in section 2.1.3 needed to be further fine tuned in light of the increasing complexity of the FMCG industry. A recent supply chain foresight report resulting from a survey conducted by Barloworld Logistics (2008) of South African FMCG organisations presented a list of supply chain objectives for the FMCG industry (as shown in figure 2-11).

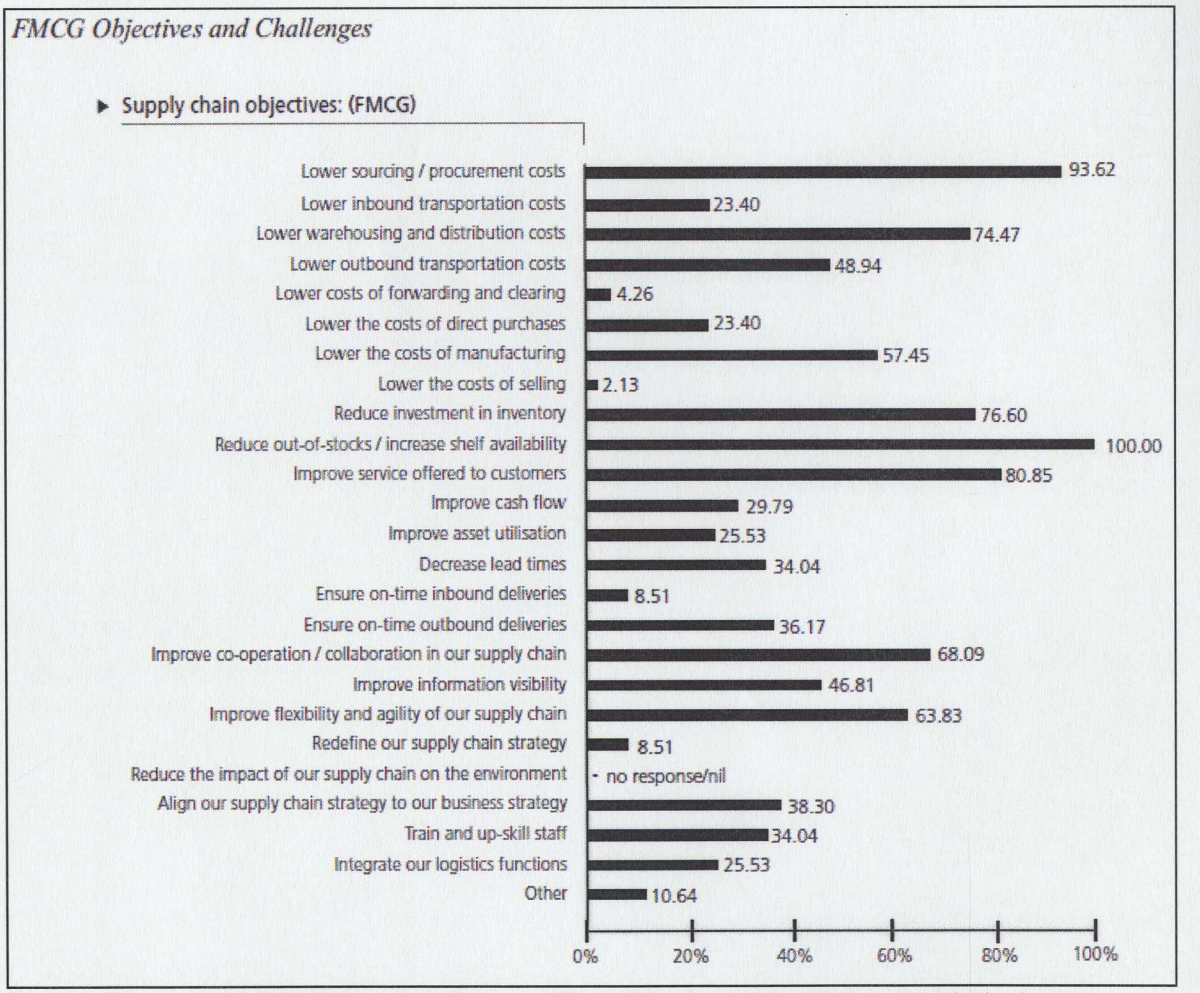

Figure 2-11: Supply chain objectives of fast-moving consumer goods industry
Source: Barloworld Logistics (2008:6)

The list showed that the focus of FMCG supply chains was on reducing costs and improving efficiencies within the buying, distribution and selling functions. This finding confirmed the main focus areas (buying and distribution) of this research study. As discussed above, retailers governed the selling function, indicating that a lesser focus was required on this area in this thesis.

The survey also collated the challenges faced by FMCG supply chains. However, the challenges were more related to local supply chains.[30] In addition, the report confirmed that the main focus of the FMCG sector was its customer base, i.e. the retail sector, and that outsourcing was mostly handled by a fourth-party logistics (4PL) firm in order to reduce supply chain costs.

Kumar (2009a) highlighted further challenges faced by FMCG supply chains:

- Supply chains owned various production plants, including co-manufacturers and co-packers, which increased complexities in the supply chain.
- Distribution was handled by specialised firms, which increased the pressure on relationships. Transport hauliers, logistic firms and warehouse service providers were typically involved.
- Wholesalers were involved in the downstream end of the supply chain, which usually consolidated the goods of many competing consumer goods manufacturers.
- The retail sector was pressurising the industry to manufacture and supply at the lowest possible price and to decrease the response time. The other

[30] The top challenges identified were increased volume flow because of their increased footprint, suboptimal planning and forecasting capabilities, capabilities of current information technology systems, skills and capability of supply chain staff, and suboptimal distribution network.

concern with the retail sector was that the "dealer owned brands". So in a sense, retailers were not only the FMCG organisations' customers, but also their competitors.

- The key[31] and basic[32] requirements for SCM were unique.

Based on the above analysis and SCM requirements, the FMCG industry displayed a set of supply chain setups and complexities that were driven by the nature of the product and the supply chain architecture. The supply chain complexities of the FMCG industry were compared with those of other industries such as heavy manufacturing, hi-tech or pharmaceutical industries in order to identify both the unique qualities of this industry and its similarity to other industries (also confirmed by Fisher, 1997).

2.2.4 Fast-moving consumer goods industry versus other industries

The supply chain typology represented a good platform to compare the supply chain setup and complexities of the FMCG and hi-tech industries. Table 2-5 represents the differences in the typology of these two industries.

[31] The key SCM requirements included support for simple manufacturing and complex distribution network, integrated distribution planning and master planning, multiple demand priorities, cost and profit optimisation, fairly distribute lack of inventory and excess inventory, co-product modelling capabilities, and generate material and capacity feasible available to promise.

[32] The basic SCM requirements for the FMCG supply chains included multi-level regional distribution centre, distribution centre and plant network, flexible horizon and time buckets including days, weeks and months, distribution requirements planning, layered planning, inventory planning, inventory bands-based allocation, multiple transportation lanes and modes, lot sizing, periodic replenishments, product substitution, shipment calendars, firm schedules, warehouse storage constraints, warehouse handling constraints, co-production, alternate bill of material and raw material constraints.

Functional attributes		
Attributes	**FMCG content**	**Hi-tech content**
Products procured	Standard (raw material) and specific (packaging material)	Highly specific
Sourcing type	Multiple (raw material) Single/double (packaging materials)	Single or double sourcing Multiple (packaging material)
Organization of the production process	Flow line	Job shop and flow Line
Repetition of operations	Batch production	Batch production
Distribution structure	Three to four stages	One to two stages
Pattern of delivery	Dynamic	Dynamic
Deployment of transportation means	Unlimited routes (3rd stage)	Unlimited routes
Loading restrictions	Chilled and non chilled transports	Standard transports
Relation to customers	Stable	Dynamic
Availability of future demands	Forecasted	Short period forecasted
Products life cycle	Several years	Several months
Products sold	Standard	Highly specific
Portion of service operations	Tangible goods	Low
Structural Attributes		
Attributes	**FMCG content**	**Hi-tech content**
Network structure	Mixture	Mixture
Degree of globalization	World wide	Global
Location of decoupling points	Deliver-to-order	Deliver-to-order and Make-to-order
Legal position	Intra-organisational	Inter- and Intra-organisational
Direction of coordination	Mixture	Mixture
Type of information exchanged	Forecasts and orders	Orders

Table 2-5: Differences in typology for fast-moving consumer goods and high-technology industries
Source: Stadtler & Kilger (eds.) (2007:235,256)

As can be seen from table 2-5, the major differences between the two industries (FMCG and hi-tech) were to be found in the areas of buying, manufacturing and distribution activities, and in the product lifecycle and the type of information shared among the entities. This again validated the main focus areas (buying and distribution) of this research study.

An optimised hi-tech industry supply chain example was that of Apple. Its iPhone was one of the industry's leading products in 2009. According to Collins & Jack (2009:12),

> the flexibility and overall capability are very impressive, especially when coupled with the vast array of applications available through the "App Store".... The second lesson to be learned from Apple's success has to do with its highly effective supply chain management. When a global sourcing strategy is executed effectively, it offers tremendous operational leverage for a company's physical supply chain.... Another key aspect of Apple's SCM is the effective use of enterprise resources planning systems for improved visibility and inventory availability.... The final lesson we can take away from Apple's success is that supply chain financial performance does matter.

In 2009, Apple's cash-to-cash cycle (which is similar to cash flow) was negative, and was one of the best in the industry (Collins & Jack, 2009). They stated that even innovative products were of little value if the supply chain behind them could not support the global sourcing, information flow, transportation, logistics, inventory management and product returns needed to make such products a commercial success.

In turn, agile and rapid responsiveness[33], as highlighted by Fisher, Obermeyer, Hammond & Raman (1994), was the key differentiator of the FMCG industry. Cheng & Choi (eds.) (2009) also identified rapid response as one of the strengths of the FMCG industry. Joerg (2006) also highlighted an efficient customer

[33] The purpose of an agile strategy is to quickly react to changing customer demands.

response (ECR) as one of the main requirements for the FMCG industry. Goldsby, Griffis & Roath (2006) discussed the application of "agile" and "lean" [34] philosophies by FMCG supply chains as being a key to their success.

In summary, the comparison indicated that FMCG supply chains were different from hi-tech supply chains in terms of supply chain setups and challenges. This led to the conclusion that the issues identified regarding the supply chains of the FMCG industry could only be benchmarked within the same industry. In addition, supply chains differed to some extent among organisations within the same industry. Cox (1999) stated that the varying degree of contestation of resources at each stage of the supply chain created an additional difference. This indicated that similar typology cases should be selected for further research so that the findings were comparable.

2.2.5 Product categories in the fast-moving consumer goods industry

The FMCG industry handled a variety of product segments, including personal care, packaged food, spirits and tobacco, household care, groceries, dairy products, etc. These products were classified into the categories of long life, perishable, chilled and ambient (CII, 2005).

Not all FMCG organisations handled the entire range of product segments. A Deloitte report (2009b) found that among the leading 250 global consumer goods firms, six of the top 20 FMCG organisations[35] were involved with only two product

[34] The purpose of a lean strategy is to obtain the lowest possible costs with minimal waste.
[35] Nestle, Procter & Gamble, Unilever, Pepsico, Kraft Foods and Coca-cola (based on net sales in financial year 2007).

segments in common, i.e. “personal care” and “packaged food”. In addition, these two product segments were identified as universal product segments and the challenges faced by these product segments were independent of natural and geographic conditions (CII, 2005). Therefore, the probability of obtaining worthwhile results when comparing the supply chains of these two product segments between different countries was high. Therefore, this thesis was focused on only these two product segments for its research.

2.3 Trade regimes in India and South Africa

This section focused on identifying underlying trade trends in India and South Africa and their effect on their supply chains.

2.3.1 Trade regime

Soanes, Stevenson & Hawker (eds.) (2008:1298) in the *Oxford English Dictionary* defined trade as "the activity of buying and selling or exchanging goods or service between people or countries".

The factors of any trade regime such as regulations, tax and trade agreements also influenced the supply chain setup in a country, and therefore the relevant trade regimes were also analysed from a supply chain perspective in this thesis. The international elements of these trade regimes were studied in detail and some aspects of local trade were also briefly touched on.

The variations in logistics time and cost across countries stemmed from differences in the quality and cost of infrastructure services, as well as differences in policies, procedures and institutions. These variations had a significant effect on trade competitiveness. Hausman, Lee & Subramanian (2005) stated that in Kazakhstan it took 93 days to export a 20-foot full container load (FCL) container of cotton apparel and in Mali it took 67 days, while in Sweden it took only six days. In Namibia, the costs of all trade-related transactions for a 20-foot FCL container, including inland transport from the ship to the factory gate, amounted to slightly more than US$ 3,000 and in Georgia to slightly less than US$ 3,000. In Germany these costs amount to only US$ 813 and in Sweden to a little more than US$ 500.

It was also stated that every one day of increment in the transit lead time of the goods from a country resulted in 1–1.5 percent reduction in trade with that country. This indicated that there was a strong relationship between supply chain costs and efficiencies, and the trade infrastructure setup in a country.

A World Bank report (2006) stated that the setup and growth of the manufacturing sector (of which the FMCG industry was a part) were similar in India and South Africa[36] (however, India was a little ahead of South Africa in terms of economic growth),[37] and a set of comparative findings were obtained for these trade regimes.[38] The trade regime from developed countries such as the US was not included in this thesis because the basic setup and infrastructure of the FMCG industry in developed countries were completely different to those of the two trade regimes selected for study. In addition, the level of maturity of the supply chains was very different in developed and the developing countries, considering the factors of the establishment of major retail chains, distribution structures, manufacturing operations and large volumes moving through the supply chains. However, as most of the literature obtained on FMCG supply chains and transnational trade was available from sources originating in the US, an indirect triangular comparison emerged in this thesis among the trade regimes of India and South Africa and the underlying literature findings from the US.

A plethora of literature was available on trade regimes for developing countries, however mostly from the perspective of with-in country trade (Shafaeddin, 2005).

[36] The GDP for the manufacturing sector for 2007 for India was 29.4%, and for South Africa it was 30.9%.
[37] The GDP growth rate for 2008/09 for India was 7.8%, and for South Africa it was 4.6%.
[38] These comparative findings are discussed later in this thesis.

Page (1994) studied trading setups and models for developing countries, although her work did not cover either India or South Africa. Greenway & Milner (1993) focused on trade in South Africa, but only to a limited extent. Sally (2008) stated that these two countries were mostly engaged with regional trade.[39] Most of the trade initiated between these two countries took place after South Africa emerged from the apartheid[40] era in 1994. India's international trade also increased globally after independence in 1947. The trade regimes of these countries are discussed individually in detail in the following subsections.

2.3.2 Trade regime in India

2.3.2.1 Country map

Figure 2-12 shows the map of India with its major cities and neighbouring countries, which was considered adequate for this research study.

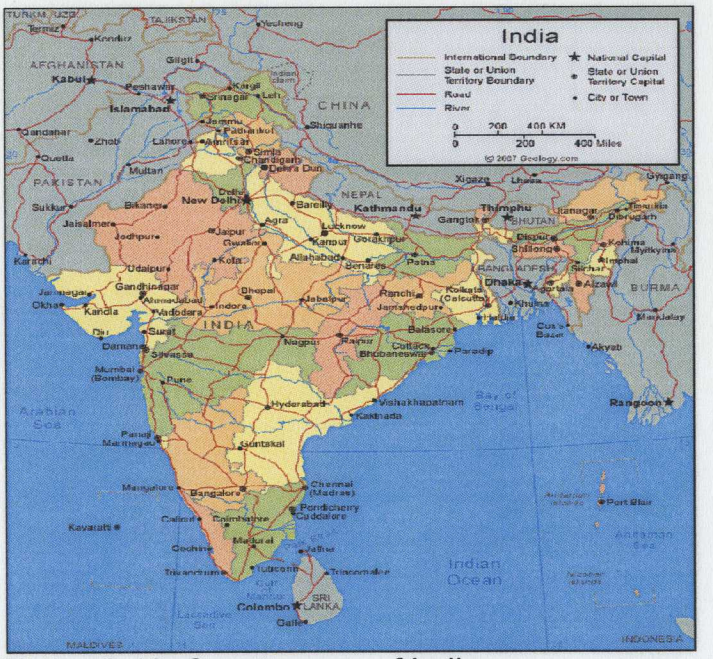

Figure 2-12: Country map of India
Source: Geology.com (2007:1)

[39] Regional trade for India – BIMSTEC and for South Africa – SACU. These are discussed later in this thesis.
[40] Apartheid referred to the system of segregation of vastly large black majority by white minority into three races with rights and limitations for each such as pass laws and residential restrictions.

2.3.2.2 India at a glance

Government	Democratic federal republic, gained independence in 1947.
Political Structure	Head of State: President (Shrimati Pratibha Devisingh Patil, elected 2007) Head of Government: Prime Minister (Manmohan Singh, since 2004) Bicameral Parliament (Sansad) comprising the Council of States (Rajya Sabha) and the People's Assembly (Lok Sabha)
Current Government	A coalition headed by Congress. There were 675 million registered voters. Over 387 million votes were cast at the last federal election in April/May 2009. The next elections must be before 2013.
Currency	Indian Rupee (Rs or INR) Aug 08 US$1 = 43 Rs; €1 = 63 Rs; £1 = 80 Rs
GDP	US$ 3 trillion at PPP; US$ 1.1 trillion at official exchange rate (Sept 07 estimated)
GDP Growth Rate	7.1% for 2008/09 (estimated)
GDP per Capita	US$ 2,700 (2007 estimated)
GDP by Sector	Agriculture - 17.2% (2007 estimated) Industry - 29.4% Services - 52.9%
Exports	2002 - US$ 44 billion 2005 - US$ 76 billion 2007 - US$ 150 billion (estimated)
Imports	2002 - US$ 52 billion 2005 - US$ 113 billion 2007 - US$ 230 billion (estimated)
Inflation Rate	12% (year to Jul 26, 2008)
Area	3.29 million square kilometres (approx 1/3 the size of the US)
Population	1.147 billion (July 2008)
Population Structure	31.5% under the age of 15 years 63.3% between 15-64 years 5.2% 65 years and over
Languages Spoken	English was the principal business language. Hindi was the first language of approx 38% of the population There were 16 further principal languages and hundreds of regional dialects.
International Airports	New Delhi Mumbai (Bombay) Chennai (Madras) Kolkata (Calcutta) Kochi (Cochin) Hyderabad Bengaluru (Bangalore)

Major Ports	Kolkata (Calcutta) – West Bengal Chennai (Madras) – Tamil Nadu Kandla - Gujarat Kochi (Cochin) - Kerala Mormuaao - Goa Mumbai (Bombay) - Maharashtra New Mangalore - Karnataka Paradip - Orissa Tuticorin -Tamil Nadu Vishakapatnam - Andhra Pradesh

Table 2-6: India at a glance
Source: Adapted from World Bank (2009a:1)

2.3.2.3 Economic history

CII (2005) stated that India is a sovereign, socialist, secular, democratic republic, as laid down in its constitution. Like the US, India also constituted a federal form of government in 1947. The federal system of government in India gave its states (provinces) a great deal of power. The federal government handled areas such as defence, foreign policy and atomic energy, while state governments handled law and order.

Soon after independence in 1947, the governments introduced an industrial policy outlining the approach to industrial growth and development, which was further modified later. Millar (ed.) (2008) pointed out that the industrial policy statement of 1980 focused on promoting competition, technological upgrading and modernisation in the domestic market by shifting from import substitution to export promotion. He also stated that the debt crisis of 1991 gave India the opportunity to institute major economic reforms to deregulate the private sector and liberalise trade and investment. This led to the drastic cutting back of the compulsory licensing of private sector industries, and by 1997 this still applied to only nine

industries. Restrictions on foreign direct investment (FDI) were also lifted, leading to a 100 per cent increase in FDI in certain industrial sectors. Figure 2-14 shows the impact of FDI on GDP of India for the period from 2000 to 2008.

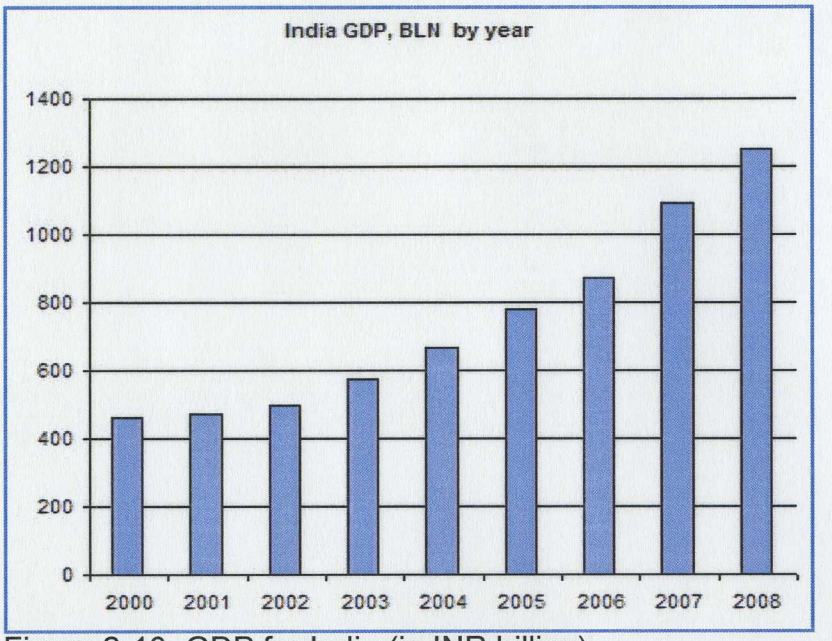

Figure 2-13: GDP for India (in INR billion)
Source: Adapted from World Bank (2009c:1)

Bhargava (2004) defined the establishment of the World Trade Organisation's (WTO) as one of the most important developments in the last millennium, and one that greatly impacted the world economic system. With the creation of the WTO in 1995, a steady process of removing quantitative quotas and reducing tariff rates on imports created a more favourable environment for export-oriented production (WTO, 2009a).

The Indian Department of Commerce (2008a) also acknowledged this fact by stating that the introduction of the WTO regime of moving towards freer trade in India changed the way in which Indian firms and markets interfaced with

international firms and markets. In the FMCG industry, this was recognised with the lifting of the quantitative restrictions (QR) barrier.

Deodhar (2002) agreed that the reduction in tariffs and subsidies and the removal of quotas caused by freer trade required the establishment of a stronger industrial foundation. Bhargava (2004) also stated that the establishment of the WTO led to the emergence of a global village with barrier-free international trade. The strategic approach by government and business enterprises to achieve economies of scale and share in international trade, together with the impact of information technology (IT) and electronic commerce, led to the development of knowledge-based enterprises. The need for the development of managerial skills, the better use of management information systems and to address global competition was also revealed. The emergence of the service sector and facilities such as call centres and IT hubs were encouraged by the WTO.

One of the innovative steps taken by the Indian government was to set up special economic zones (SEZs). SEZs were geographical regions whose economies were governed by laws – particular laws pertaining to economic activity – that were more liberal than those applied in the rest of the country. The model was adopted from the People's Republic of China in the early 1980s.[41] The SEZs offered the advantages of special and reduced tax rates[42] and further incentives to promote the Indian export sector.

[41] The most successful SEZ in China, Shenzhen, developed a small village into a city with a population of over 10 million within 20 years (Millar (ed.), 2008).
[42] In some instances, taxes were reduced to 0%.

2.3.2.4 Retail sector

The Indian retail sector was very fragmented with over 12 million shopkeepers accounting for 97 percent of retail sales (Mishra, 2008). The distribution and sales setups of supply chains were very different from the US model, due to the sheer volume and maturity of supply chains (with time) in India, where established retail players were instrumental in most retail sales.

According to Dyer, Johnson, McGregor & Merchant (2005), the Indian retail sector was worth more than US$ 200 billion a year in revenues and was made up mainly of small neighbourhood stores, street markets and hawkers. Despite political discord, prospects were improving for multinationals to establish a presence. A few retail chains started cropping up from 2002 onwards.[43] However, the researcher felt that an organised and established retail setup will take a while to become prominent in India.

Another aspect of the Indian FMCG consumer base was the rural consumers living in more than 600,000 villages across the country who constituted over 70 percent of the population. The World Bank (2009c) stated that these rural consumers, whose income levels were increasing, accounted for well over 60 percent of the national demand for several product categories. Figure 2-14 illustrates the differential growth rates between urban and rural consumption for specific personal care products.

[43] A few of the established retailers in India were D-mart, K-mart, food bazaar and Reliance stores.

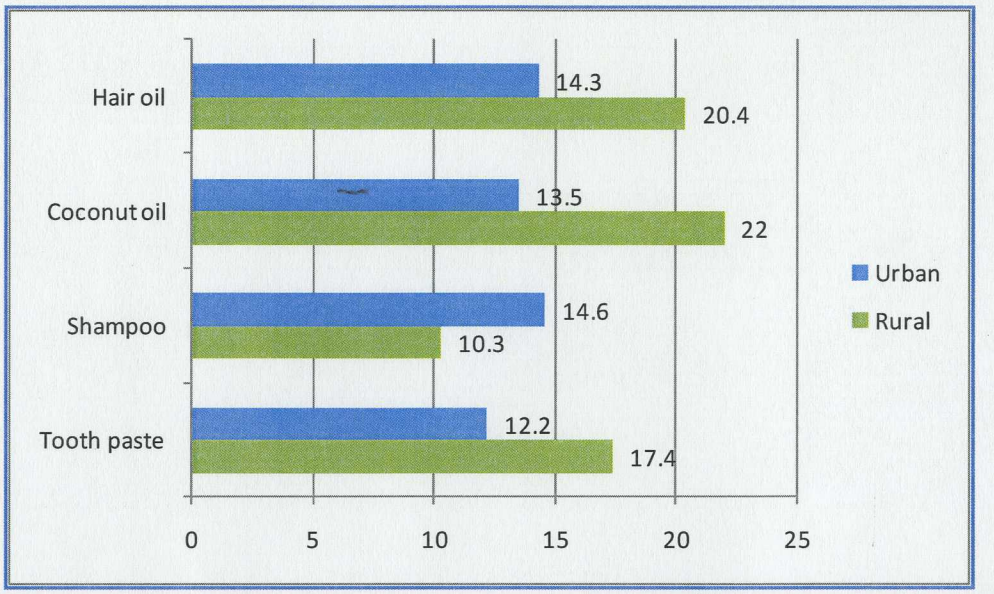

Figure 2-14: Indian urban and rural growth rates for personal care products
Source: Adapted from World Bank (2009c:44)

The higher growth rates for rural consumption indicated that organisations with an extensive supply chain distribution network will have a better opportunity to serve this growing demand, despite the country's weak infrastructure, diverse geography and significant channel fragmentation.

2.3.2.5 Taxes

According to a World Bank report (2009c), in 2009 all the states in India came under the value-added tax (VAT) regime. The standard rate of VAT was 12.5 percent.[44] However, this rate varied among the states, creating complexity in the supply chain. Also, state taxes were different among the states, and this had a huge impact on any attempts to establish manufacturing industries in a particular state. Service taxes and excise duties also played an important role in defining the supply chain footprint.

[44] There was a reduced rate of VAT of 4 percent (generally available for information technology products, industrial inputs, agricultural equipments, etc.) and 1 percent (generally applicable on gold, silver, precious stones, including jewellery made of such precious metals and stones).

2.3.2.6 Regional agreements

The Indian subcontinent established a regional trade setup, BIMSTEC, which Banik (2005) stated was formed in 1997 with Bangladesh, India, Myanmar, Sri Lanka, Thailand, Bhutan and Nepal as its member. It was formed with the idea of encouraging greater socio-economic co-operation among the member nations in the areas of technology, transport and communications, energy, tourism, agriculture, fisheries, and human resources (HR) development. In addition to sectoral co-operation, BIMSTEC also focused on strengthening co-operation in the areas of trade and investment.

2.3.3 Trade regime in South Africa

2.3.3.1 Country map

Figure 2-15 shows the map of South Africa with its key cities and neighbouring countries, which was considered adequate for this research study.



Figure 2-15: Country map of South Africa
Source: Geology.com (2007:1)

2.3.3.2 South Africa at a glance

Government	Constitutional democracy, gained independence from apartheid in 1994
Political Structure	Head of State: President (Jacob Zuma, elected 2009)
Current Government	Headed by African National Congress. There were 20 million registered voters in 2009. The next elections must be before 2013.
Currency	South African Rand (R or ZAR) Jan 08 US$1 = 7.13 R; €1 = 10.5 R; £1 = 13.1 R
GDP	US$ 492.7 billion at PPP (2008)
GDP Growth Rate	3.1% for 2008/09 (estimated)
GDP per Capita	US$ 10,119 (2008)
GDP by Sector	Agriculture – 2.7% (2007 estimated) Industry – 30.9% Services – 66.4%
Exports	1997 - US$ 36.6 billion 2006 - US$ 75.2 billion 2007 - US$ 81.8 billion
Imports	1997 - US$ 31.4 billion 2006 - US$ 71.2 billion 2007 - US$ 77.5 billion (estimated)
Inflation Rate	6.2% (2007)
Area	1.2 million square kilometres (ranked 25th by area amongst world countries)
Population	47.9 million (2008 estimated)
Population Structure	79.5% Black 9.2% White 8.9% Coloured 2.5% Asian
Languages Spoken	English as the main language. There were 11 principal languages.
International Airports	Johannesburg Durban Cape Town
Major Ports	Durban Cape Town Saldanha Richards Bay Port Elizabeth George

Table 2-7: South Africa at a glance
Source: Adapted from World Bank (2009b:1)

2.3.3.3 Economic history

Cassim, Onyango & Van Seventer (2004:7) noted that the first stage of economic liberalisation happened in the South African economy in 1972 with the report of the Reynders Commission of Inquiry:

> The report recommended the introduction of an export development assistance scheme to spur exports, involving a tax allowance for marketing expenses. The report further advocated the replacement of QRs with tariffs lower than those implicit in the QRs, together with a real devaluation of the Rand.

The second liberalisation episode started in 1983 with a review of the debt crisis and the establishment of the Board on Trade and Tariffs to support global trade. In 1990, the setting up of a general export incentive scheme assisted the country to further improve its global trade. Since its emergence from the apartheid era in 1994, the government has focused on promoting economic growth and FDI by relaxing restrictive labour laws and stepping up the pace of privatisation. A shift from a state-dominated economy to a market-based economic systems emerged.

South Africa was the largest energy producer and consumer on the African continent in 2009. The currency, the South African rand (ZAR), joined a club of seventeen currencies through the continuous linked settlement (CLS) scheme in 2004, where foreign exchange transactions among these currencies were settled immediately, lowering the risks of transacting across time zones and risks related to credit (CLS, 2009).[45] The GDP of the country showed a steady growth over a

[45] Details on CLS are presented in Appendix D3.

period from 1994 to 2008. Figure 2-16 shows GDP growth in South Africa for this period.

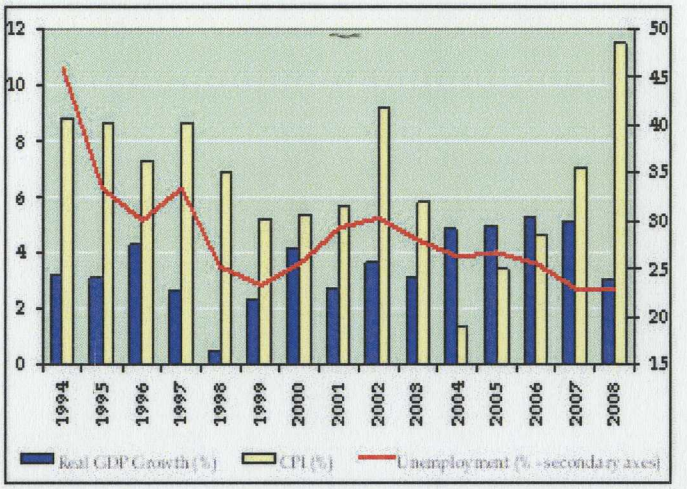

Figure 2-16: Gross domestic product growth in South Africa
Source: World Bank (2009b:1)

South Africa joined the WTO in 1995, initiating a shift to export production and integrating the country's trade with the global economy. The Department of Trade and Industry (2008) stated, however, that the lower return on investment (ROI) as a result of the country's underdeveloped infrastructure support systems created an absence of reliable information sources and resulted in a weakening of the alignment between South Africa and the world economy.

2.3.3.4 Retail sector

The organised retail sector of South Africa was dominated by many established players such as Shoprite, Checkers, PicknPay, Spar, Game, Dion, etc. A small percentage of the fragmented retail sector primarily had a presence in the rural and semi-urban areas. However, this disorganised segment was, to certain extent, serviced by the organised sector. The retail sector controlled the mainstream of the FMCG industry in South Africa.

2.3.3.5 Taxes

In 2009, the VAT rate on all the goods was 14%, except on a few items, such as fresh foods, that were non-vatable. VAT was refundable on export goods. All the provinces had the same tax structure.

2.3.3.6 Regional agreement

The DTI (2008) stated that one of the key factors emerging from the WTO was the various regional trade agreements (RTAs).[46] Many RTAs were registered with the WTO (a total of 250 by 2003) and the numbers were increasing rapidly (World Trade Organisation, 2009b). The South African Customs Union (SACU) was a good example of this, similar to BIMSTEC on the Indian subcontinent. South Africa, Botswana, Lesotho, Swaziland and Namibia were the members of SACU.

One of the landmarks of the South African trade regime was the setting up of the International Trade Administration Commission (ITAC). ITAC (2008:1) stated that ITAC's mission was "to create an enabling environment for fair trade though customs tariff investigations, trade remedies and import and export control".

2.3.4 Comparing trade regimes and their microeconomic impact

From the previous two subsections, it was established that both South Africa and India became economic powers after their independence and they went through similar stages of trade liberalisation. In addition, both countries slashed QRs and

[46] RTA was defined as grouping of countries which are formed with the objective of reducing barriers to trade between member countries. Contrary to what the name suggests, these groupings or unions may be concluded between countries not necessarily belonging to the same geographical region.

joined the WTO, which acted as a major milestone in their economic growth, and used regional organisations to promote international trade.

In order to understand these countries' microeconomic scenarios further and the impact of their trade regimes on their supply chains, their key performance indicators (KPIs) related to export and logistics were analysed (Hausman, Lee & Subramanian, 2005).

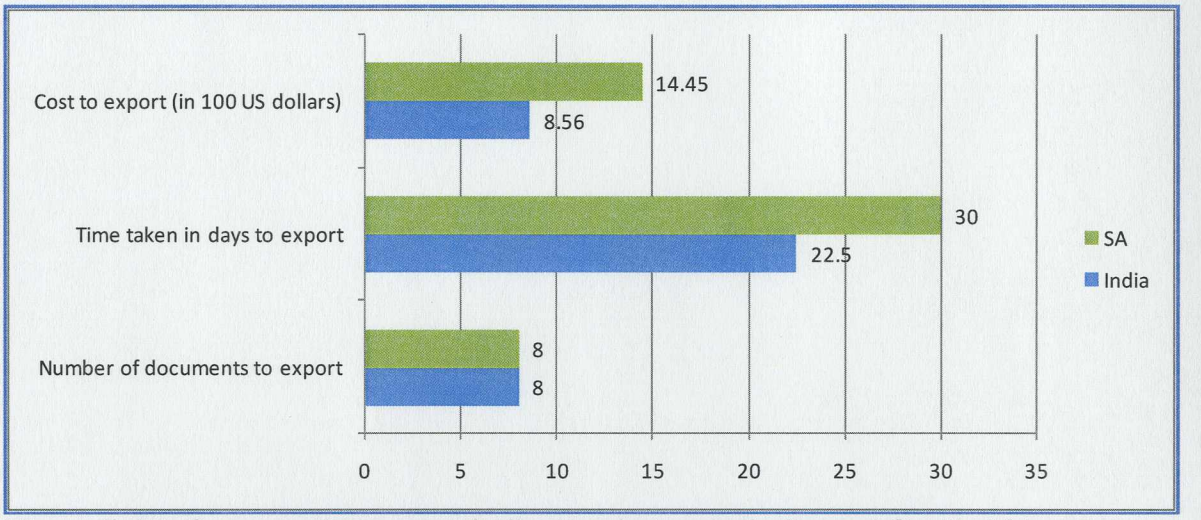

Figure 2-17: Comparative export indicators between India and South Africa
Source: Compiled from Hausman, Lee & Subramanian (2005:1)

As can be seen from the above figure, exports from India were cheaper, with standardised policies and document templates; while exports from South Africa took longer and were more expensive. It was interesting to note that despite the low usage of technology by the Indian customs service, it was still quicker and cheaper to export from India. This may be due to the additional regulations adopted by South African customs to control the export trade.

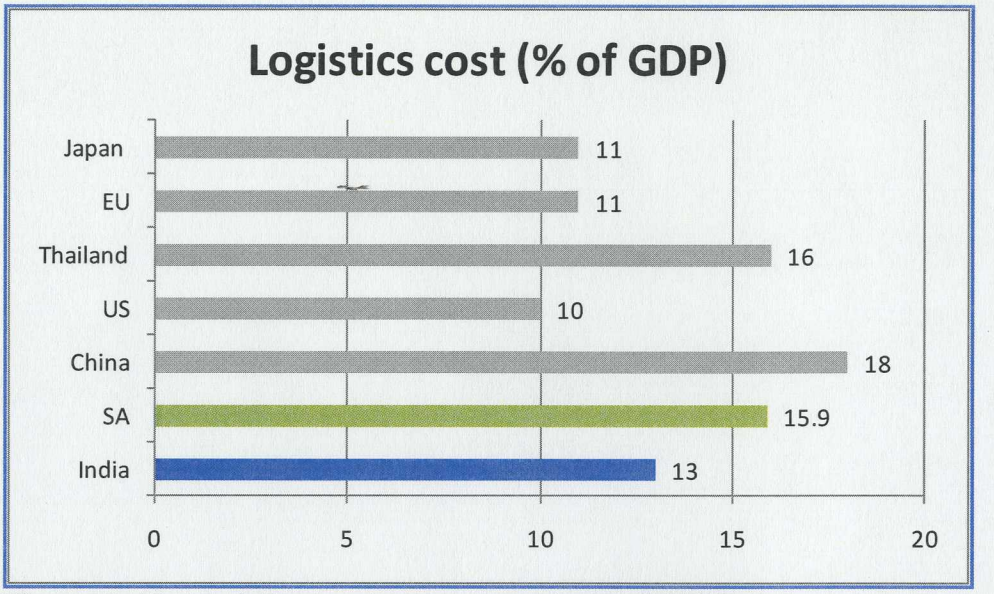

Figure 2-18: Logistics cost as a percentage of GDP
Source: Adapted from World Bank (2009d:25)

As shown in figure 2-18, the logistics costs[47] (as a percentage of GDP) were higher in India and South Africa than in developed countries. The logistics costs in South Africa were higher than those in India due to South Africa's higher use of road transport as opposed to rail transport (Cilliers & Nagel, 1994).

In addition, transaction taxes (import/entry, manufacture and sale of goods and provision/receipt of services) had a direct and tangible impact on supply chain costs (through cost of goods or services). The taxation system in India was identified as being quite complex, and a few goods were taxed twice, firstly by the federal government and secondly by the state government. Appendix D2 shows the detailed Indian tax structure.

[47] Logistics cost comprised of inventory, transport and administration costs.

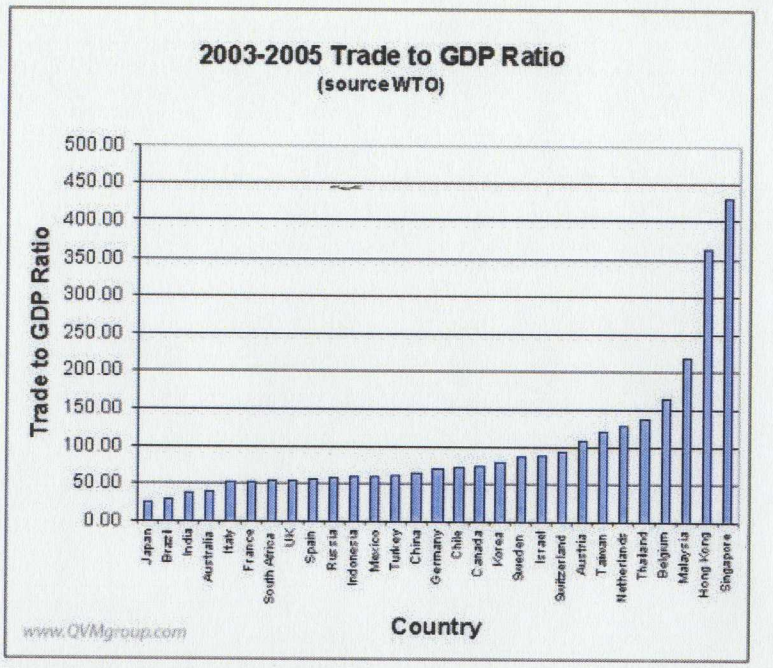

Figure 2-19: Trade to GDP ratio
Source: Adapted from WTO (2009a:1)

As seen from the above figure, the trade-to-GDP ratio for Brazil, India and South Africa was similar. To further compare these trade regimes with other similar developing trade regimes, a regional trade regime from South America (Brazil), Mercosur, was used as a benchmark.

A great deal of trade occurred among these three trade regimes. Lai (2006) studied Indian, Brazilian and South African[48] (IBSA) co-operation in forming the South-South trade regime. The foundations for IBSA co-operation were laid at the 2003 United Nations General Assembly, when the leaders of three countries spearheaded a new approach to South-South co-operation, resulting in a trilateral India-Brazil-South Africa agreement. The Mercosur trade regime is studied in detail in the next section.

[48] Lai called them "regional goliaths".

2.3.5 Trade regime in South America

The International Labour Organisation (2008) defined Mercosur[49] as a trading bloc in Latin America comprising Brazil, Argentina, Uruguay and Paraguay, with Chile and Bolivia as associate members. Mercosur became a successful market of about 200 million people, representing about US$ 1 trillion of GDP and US$ 190 billion of trade. It was the fourth largest integrated market after the European Union (EU), the North American Free Trade Agreement (NAFTA), and the Association of South-East Asian Nations (ASEAN).

The Department of Commerce (2008b) stated that India conducted trade worth US$ 1.4 billion with Mercosur during the period 2003-2004. India's exports to Mercosur were approximately US$ 567 million during this period and its imports from Mercosur were around US$ 850 million. The South American region demonstrated a huge potential for Indian exports as India's share of Mercosur's global imports was just 0.83 percent.

The DTI (2008) stated that only 2 percent of South Africa's total trade was with Mercosur in 2008, with strong future growth predictions. Trade between South Africa and Mercosur grew significantly between 1994 (ZAR 2.7 billion) and 2000 (ZAR 6 billion). In December 2000, a framework for the creation of a free trade agreement was signed by South Africa and Mercosur. The aim of the agreement was to strengthen existing relations, promote the expansion of trade and establish the conditions for the creation of a future free trade agreement between Mercosur and SACU.

[49] Mercosur was formed in 1991 with the objective of facilitating the free movement of goods, services, capital and people among the member countries.

Supply chain KPIs that were used to compare the trade regimes of Brazil, India and South Africa were inventory days for the FMCG industry. Figure 2-20 shows the comparison.

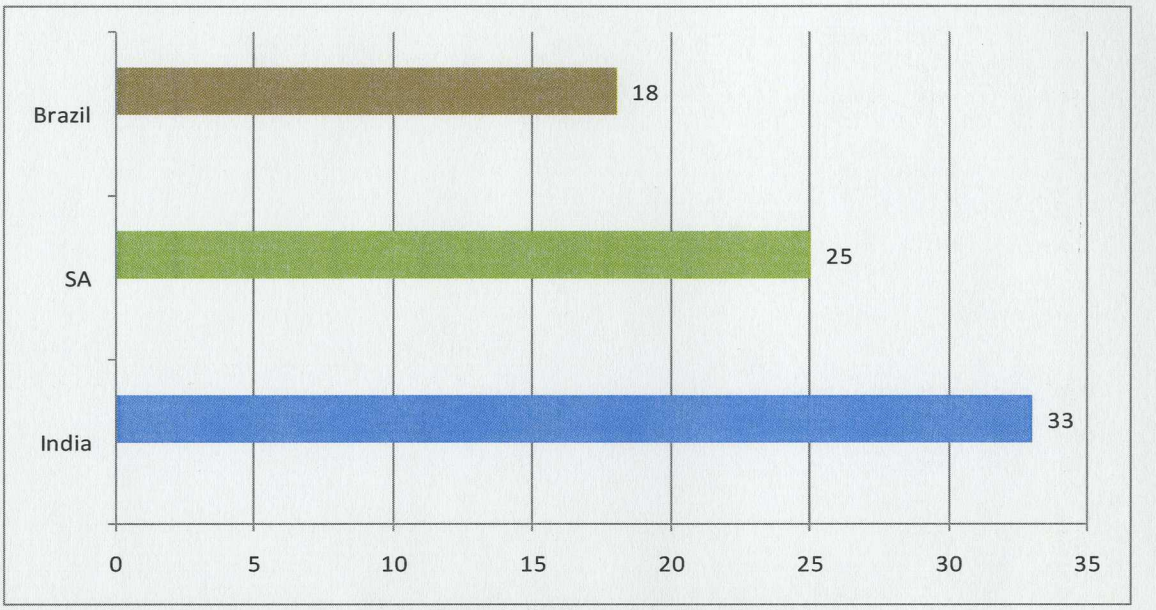

Figure 2-20: Inventory days in Brazil, India and South Africa
Source: Adapted from World Bank (2009d:37)

Higher inventory days for India were due to the storage of products at multiple locations to cover the geographic spread of the customer base, while South Africa also had comparatively higher inventory days due to its suboptimal supply chain networks and outsourced distribution setup.[50] Brazil enjoyed a much lower inventory days figure.

[50] The impact of outsourced distribution is discussed in "interpretation of findings" sections.

2.4 Supply chain managers

The profile of a supply chain manager in an FMCG supply chain setup was explored in terms of its skills, roles and responsibilities, competency model and expected requirements.

2.4.1 Skills

A talent shortage was perceived to be imminent in the US as labour supply and demand figures showed a growing skilled labour gap. The US Bureau of Labour Statistics (2009) predicted a shortage of 10 million workers in the US by 2025. The report also stated that the working age population will shrink by 47 percent between 2000 and 2050 and 20 percent of the workforce in 2009 will have the skills for 60 percent of the jobs in 2020. Figure 2-21 shows the skilled labour gap in the US.

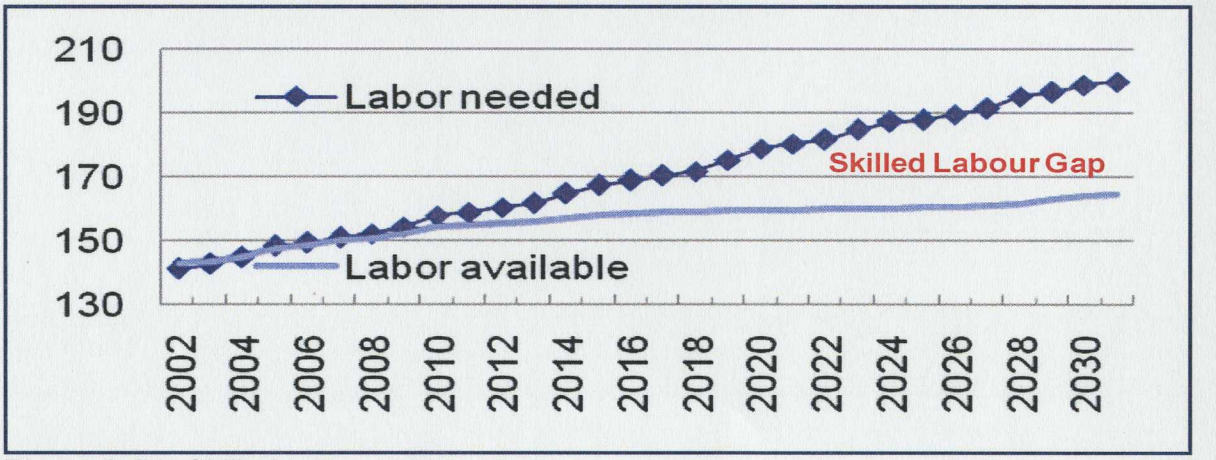

Figure 2-21: Skilled labour gap
Source: Bureau of Labour Statistics (2009:1)

How does this affect consumer goods firms? Demand for the key consumer goods workforce segments was expected to grow rapidly between 2006 and 2016. Table 2-8 shows the growth rate for these key workforce segments.

Position	Expected growth rate
Consumer and market researchers	19.7%
Marketing managers	14.4%
Customer relationship managers	10.2%
Supply chain professionals	17.3%

Table 2-8: Expected growth rate for key positions in consumer goods industry
Source: Bureau of Labour Statistics (2009:1)

As per the above table, the demand for supply chain professionals for the FMCG industry will increase significantly due to the shortage of appropriate skills and the broadening scope of transnational supply chains.

2.4.2 Roles and responsibilities

In the era of a shrinking economy (resulting from the credit crunch of 2008/2009), supply chain managers were faced with the challenges of reducing costs. Valla (2009:40) stated:

> Typically, the supply chain organization does not control product or market strategy, and pricing and revenue goals are set elsewhere in the organisation. Nevertheless, the supply chain executive has direct influence on a powerful source of competitive advantage: the supply chain staff and how they interact with internal customers within the enterprise.

It was established that supply chain managers were required to play a consultative selling role for both internal and external customers. They were also required to identify opportunities in the value chain by asking a different set of questions focused on customers' core business processes.

Supply chain managers were the key role players in an organisation and usually the owners of an organisation's supply chain (Selznick, 1984). Despite the popular meaning of the term "supply chain" in FMCG organisations, the person who was responsible for managing the supply chain was not always called a "supply chain manager".[51]

Ayers (2006) presented a summary of the roles and responsibilities of a supply chain manager in the categories of mission, and long-term, intermediate-term and short-term supply chain activities (table 2-9).

	Executive	Procurement	Manufacturing	Distribution	Marketing and Sales	R&D/Engineering	Planning of finance
Candidate missions							
link the supply chain to the customer					y		
match supply and demand	y						y
design source, make, deliver and return pro	y	y	y	y			y
end-to-end" operating responsibilities		y	y	y			
Long term roles and responsibilties							
new product introductions						y	
make or buy	y					y	y
new facility requirements							y
inventory business rules							y
flexibility requirements	y						
define information system requirements							y
Intermediate term roles and responsibilties							
sales and operations planning (S&OP)			y		y		
forecasting requirements	y				y		y
production priorities					y		
sourcing / supplier selection		y					
operating cost reduction - suply chain level	y	y	y	y			
new product cost targeting					y		
product / customer reduction					y		
Puchase / implement-related information system							y
Short term roles and responsibilities							
purchasing management		y					
distribution management			y				
manufacturing management				y			
returns management			y				

Table 2-9: Roles and responsibilities of a supply chain manager
Source: Ayers (2006:83,84)

Two things could be inferred from the above table. Firstly, the role of a supply chain manager was segregated among different planning levels. However, the depth of the focus on each of these planning levels differed among the different supply chains. Secondly, the role of a supply chain manager was spread across various functions, from research and development (R&D) to execution. This

[51] In many organisations, few such positions as "purchasing manager", "sourcing manager", "commodities executive", "supply chain executive", "chief operating officer", "logistics manager", "production manager" and "warehouse manager' were responsible for the various supply chain functions.

indicated that the profile of a supply chain manager was a combination of the traditional line functional role and a role that involved an understanding of the processes flowing across the organisation. In addition, the supply chain manager interfaced with the marketing and sales function (not core supply chain functions, as identified earlier) through S&OP, the demand forecasting process and the new product introductions (NPIs) exercise.

Mentzer (2006) and Aqunio & O'Marah (2009) stated that the core responsibility of a supply chain manager was to address the co-ordinating challenges that characterised a global supply chain. APICS (2009:2) further stated that supply chain managers were crucial to the global economy:

> They represent a unique discipline responsible for supporting the global network of delivering products and services across the entire supply chain, from raw materials to end customers. Specifically, supply chain managers engage in the design, planning, execution, control, and supervision of supply chain activities with the objectives of creating net value, building a competitive infrastructure, leveraging worldwide logistics, synchronizing supply with demand, and measuring performance globally.

2.4.3 Competency framework

APICS (2009) defined a competency model for the supply chain manager, based on the employment and training administration of the US Department of Labour. The model was based on seven tiers and their corresponding competency requirements, as shown in figure 2-22.

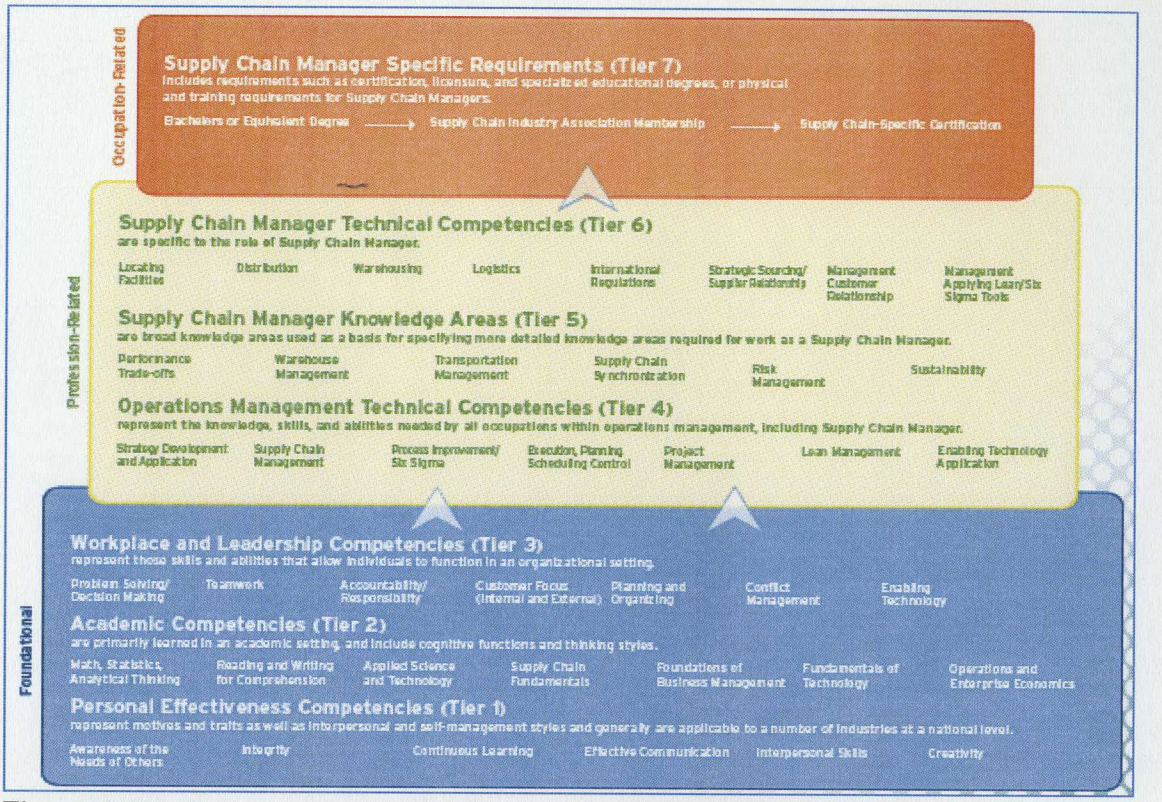

Figure 2-22: Competency model for supply chain managers
Source: APICS (2009:3)

It was indicated that a combination of all three segments across all seven tiers was required to tackle the short- and long-term challenges of an advanced and mature supply chain.[52]

2.4.4 Requirements

As mentioned above in the discussion of the competency framework, supply chain managers were required to have a broad knowledge of traditional lines of business.[53] Mentzer (2006) identified the needs of a manager with a supply chain orientation such as having a collaborative and teamwork-oriented management

[52] The maturity of a supply chain was defined as the number of years of it being in existence. The maturity of the supply chain decisions, a different topic, was suggested as an area for future research.

[53] It referred to main lines, such as finance, marketing, production, accounting, sales and procurement, and speciality lines, such as customer relationship management, procurement/supplier management, operations/logistics management and process/product design.

style, appropriate operational excellence, adequate IT proficiency and an ability to assess environmental trends. Supply chain leaders were required to be good mentors with a metrics orientation and a cross-functional attitude. This orientation became crucial when a supply chain became transnational. The globalisation process changed the roles and responsibilities of the supply chain managers with a shift in focus to global talent and performance management.

Supply chain managers faced continuous pressures for cost savings because of mounting competition as a result of globalisation. Tohamy, Ragsdale & Gaynor (2006) stated that organisations' supply chain strategies were not always aligned to address these challenges. Network-centric solutions and service models were required to assist organisations to cope with the pressures in present and emerging global markets.

Figure 2-23 depicts the various supply chain responsibilities shared among various supply chain functions with regard to supply chain KPIs.



Figure 2-23: Supply chain KPIs shared among supply chain functions
Source: Deloitte report (2007:24)

As can be seen from the above figure, supply chain KPIs were shared among various supply chain functions, and the above figure validated the earlier conclusion that the involvement of the supply chain manager with sales related activities was limited.

2.5 Supply chain performance

The literature was explored in terms of the research framework for models that could examine the performance of the supply chain and highlight issues when the various cases studied in this thesis were researched. No single model could analyse the performance of the supply chain holistically (Eschinger, 2008),[54] and, in addition, in order to identify the issues faced by the different types of supply chains, a range of models were required. This research study used three different dimensions to analyse the performance of the supply chain:

a. operational performance

b. financial performance

c. governance performance.

Further aspects, such as ethical considerations, could also possibly influence the performance of a supply chain, but this thesis was focused only on tangible aspects of supply chain performance. One could argue that the ethical performance can also be measured, and hence is not intangible. However, the researcher felt that measuring ethical performance was a subject of the field of humanities and may be a good area for future research.

The above three dimension were studied individually in the subsections that follow.

[54] Eschinger (2008) identified it from perspective of supply chain applications, which inherently used different supply chain models.

2.5.1 Operational performance

The literature was explored to identify the models used to analyse the operational performance of a supply chain, and several were found. This research study could not assess all the models available in the literature, for obvious reasons, and limited its discussion to three of them. These three models were studied in detail to identify which was the most appropriate that could be used to analyse the operational performance of a transnational FMCG supply chain. The three models, which had multiple references in the literature and which are further studied in this thesis, were:

a. the resource-event-agent (REA) model

b. the supply chain operations reference (SCOR) model

c. the balanced scorecard (BSC).

2.5.1.1 Resource-event-agent

The REA business model was developed by William E. McCarthy. Robert Haugen collaborated with McCarthy to extend REA[55] to cover supply chain management. The key extension was the dependent demand relationship as defined by manufacturing resource planning (MRP) systems. Figure 2-24 represents some of the REA links.

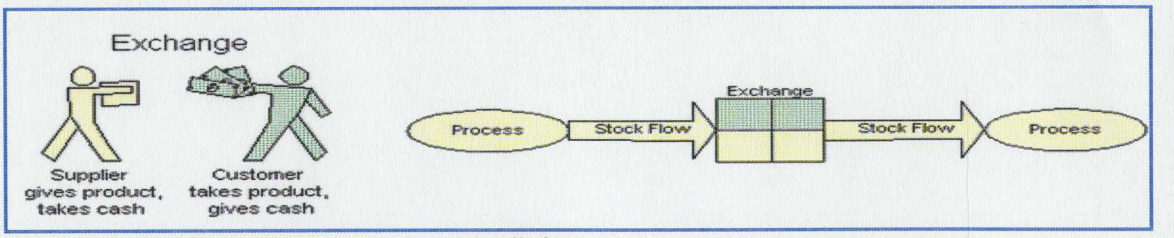

Figure 2-24: Resource-event-agent links
Source: Haugen & McCarthy (2000:1)

[55] REA was originally designed for accounting.

As a semantic web, REA linked economic events together across different firms, industries and nations. The links were activity-to-activity or agent-to-agent or person-to-person, not just firm-to-firm. This means that each individual in a REA supply chain could be linked directly to each other individual.

This model defined the performance of the supply chain at a detailed level (activities) and focused on links (relationships) to identify the existence of an activity. Such a model could define the characteristics of the relationships between processes in a supply chain, but lacked the depth needed to define the functional typology of a process itself. Also, the details (i.e. KPIs) related to the strategic and tactical levels could not be inferred from this proposed lower level of detail.

2.5.1.2 Supply chain operations reference model

The SCOR model was developed by a joint collaboration of leading FMCG firms. It was developed to describe the business activities associated with all phases of satisfying customer demand, i.e. customer interactions, all physical material transactions and market interactions. The model was organised around the five primary management processes of planning, sourcing, making, delivering and returning,[56] as shown in figure 2-25.

[56] Initial versions of SCOR model included only four management processes: plan, source, make and deliver. Return (source and customer) process was included in the version 5.0. The version 9.0 was released in year 2008.

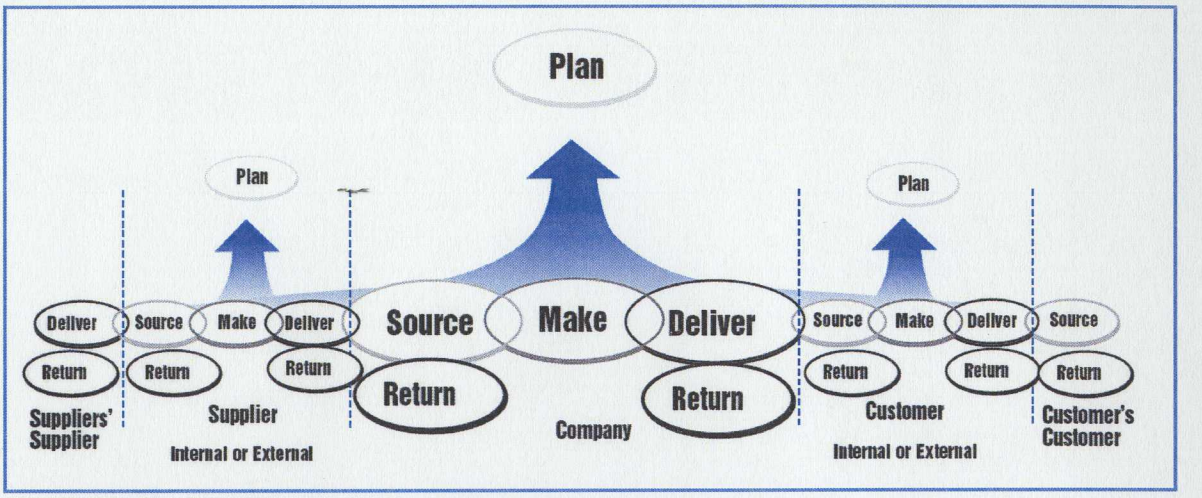

Figure 2-25: SCOR management processes
Source: SCC (2008:1)

The SCOR model was also a business process reference model that included business process re-engineering (standard definition of processes), benchmarking (standard metrics) and best practice analysis (management practice for best-in-class performance).

The model was designed and maintained to support supply chains of various complexities and across multiple industries. It was focused on three process levels.[57] The SCOR model was widely used in academia and in practice.

However, the model did not address the areas of sales and marketing, HR (training), R&D (product development and quality assurance) and IT, and it did not attempt to prescribe how a particular organisation should conduct its business.[58]

[57] The process levels were process type, process category and process element.
[58] Every organisation that implemented the SCOR-model was required to extend the model at least to a level 4 using organisation-specific processes, systems and practice.

The SCOR model, similar to the REA model, was also focused on the activity involved. It used a hierarchical framework to depict the top- and lower-level details.

2.5.1.3 Balanced scorecard

The BSC was developed as a multidimensional framework for describing and implementing a firm's strategic intent at all levels (Kaplan & Norton, 1996). This was achieved by linking objectives, initiatives and measurements to the organisation's strategy. The BSC was widely used across the industry.[59] [60]

The BSC was based on several generally accepted management frameworks, as depicted in figure 2-26.

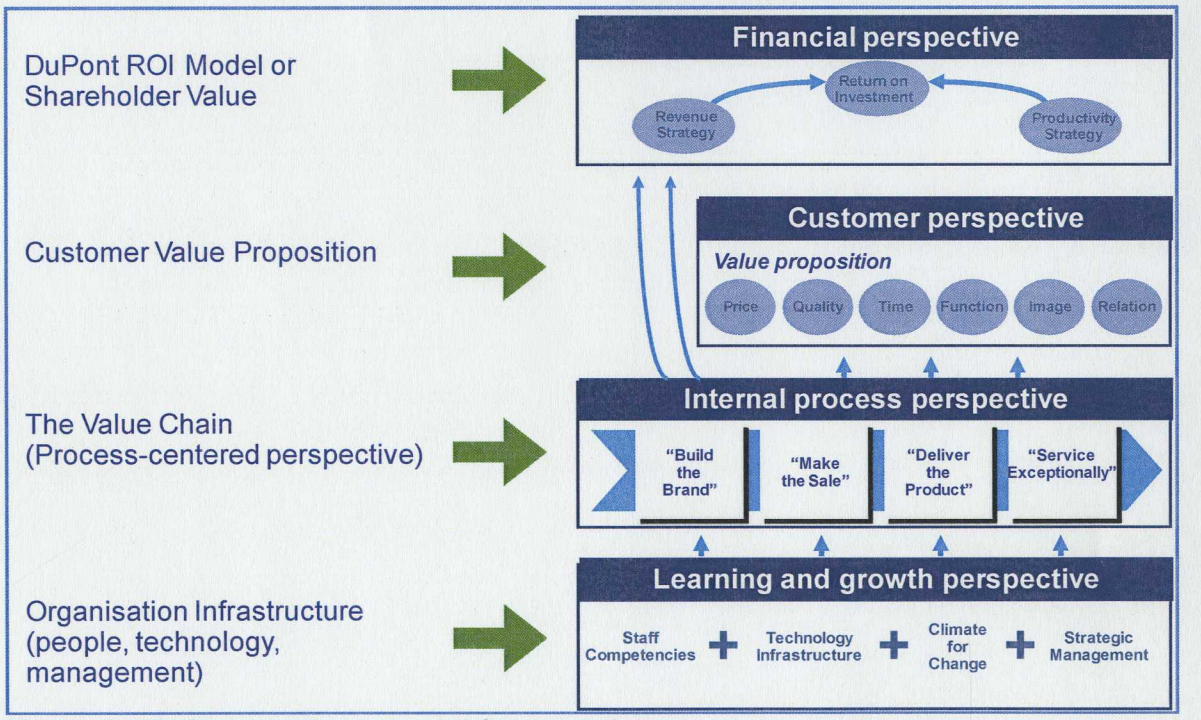

Figure 2-26: Balanced scorecard framework
Source: Adapted from Kaplan & Norton (1996:23)

[59] Kaplan & Norton mentioned that more than 500 corporations have delivered significant business results by creating strategy focused organizations through the BSC.

[60] Booz & Allen, a global consulting firm mentioned that half of North American corporations implemented BSC, and the number was growing.

The BSC analysed the supply chain system and its performance across the above four categories. Some of the KPIs are shown below.

Financial measures

Measure	Value
Return on plant investment	%
Manufacturing cost per ton	Currency
Days of finished goods inventory	Days
Profitability by channel	Currency

Table 2-10: Overall supply chain metrics (financial)
Source: Adapted from Kaplan & Norton (1996:47)

Customer measures

Measure	Value
Finished goods inventory out of stock	%
Performance to schedule	%
On time – in full	%

Table 2-11: Overall supply chain metrics (customer)
Source: Adapted from Kaplan & Norton (1996:63)

Internal measures

Measure	Value
Effective capacity utilisation	%
Average product run frequency	#
Manufacturing reliability	%
Material loss	%

Table 2-12: Overall supply chain metrics (internal)
Source: Adapted from Kaplan & Norton (1996:92)

Learning and innovation measures

Measure	Value
Employee satisfaction index	#
Employee with supply chain skills	%
Process/business rules adhered	%

Table 2-13: Overall supply chain metrics (learning & innovation)
Source: Adapted from Kaplan & Norton (1996:126)

The BSC, although comparatively elaborate and comprehensive, reflected a high degree of freedom regarding customisation, resulting in most instances of the BSC functioning in isolated and independent frameworks. Hence, in practice, two

separate instances of the use of the BSC could not be compared and benchmarked against each other. Also, it failed to suggest best practices at an activity level.

2.5.1.4 Comparison of operational performance models

The above three models each provided a sound model for a supply chain. However, the objective of this thesis was to identify a model that qualified in terms of the following five criteria:

- Firstly, it should be suitable for the FMCG industry.
- Secondly, it should define standard supply chain activities.
- Thirdly, it should be capable of analysing and measuring the performance of a supply chain at all levels and across all activities.
- Fourthly, it should allow for benchmarking.
- Fifthly, it should suggest best practices within the supply chain environment.

The table below shows the capabilities of the three discussed models on a three-grade scale.[61]

Criterion	REA	SCOR	BSC
Suitable for FMCG industry	Not-strong	Very-strong	Strong
Define standard supply chain activities	Not-strong	Very-strong	Strong
Analyse and measure performance at all levels/all activities	Not-strong	Strong	Very-strong
Provide benchmarking	Not-strong	Very-strong	Not-strong
Suggest best practices	Not-strong	Very-strong	Not-strong

Table 2-14: Comparison criteria for the operational performance models

[61] A three grade Likert scale was used: Very-strong, Strong, and Not-strong.

It was evident from the above table that the SCOR model strongly qualified on all five criteria. The researcher, however, did not want to discount the BSC model, as it was widely used by businesses. A further comparison was made between the BSC model and the SCOR model at a detailed level. It found that most of the performance metrics noted in the BSC also existed in the SCOR model, and in addition, the SCOR model permitted benchmarking and provided a best-in-class framework. These two additional capabilities were seen as being essential for further research.

Therefore, the SCOR model was chosen to represent the operational performance model in this thesis. The SCOR performance attributes, at the higher level, were discussed in the next sub-section.

2.5.1.5 Performance attributes

The performance attributes of the SCOR model were studied in further detail. These performance attributes (linked to level 1 metrics) were characteristics of a particular supply chain that allowed it to be analysed and evaluated against other supply chains (SCC, 2008). Level 1 metrics were a set of primary and high level measures that crossed multiple SCOR processes.

Table 2-15 provides the definition of the performance attributes and corresponding level 1 metrics.

Performance attribute	Performance attribute definition	Level 1 metric
Supply chain reliability	The performance of the supply chain in delivering: the correct product, to the correct place, at the correct time, in the correct condition and packaging, in the correct quantity, with the correct documentation, to the correct customer.	Perfect order fulfilment
Supply chain responsiveness	The speed at which a supply chain provides products to the customer.	Order fulfilment cycle time
Supply chain flexibility	The agility of a supply chain in responding to marketplace changes to gain or maintain competitive advantage.	Upside supply chain flexibility
		Upside supply chain adaptability
		Downside supply chain adaptability
Supply chain costs	The costs associated with operating the supply chain.	Supply chain management cost
		Cost of goods sold
Supply chain asset management	The effectiveness of an organization in managing assets to support demand satisfaction. This includes the management of all assets: fixed and working capital.	Cash-to-cash cycle time
		Return on supply chain fixed assets

Table 2-15: Definitions for supply chain performance attributes
Source: SCC (2008:1)

This research study used the SCOR performance attributes to identify key issues and the overall SCOR model to benchmark a supply chain finding and to suggest best-in-class practices for the identified supply chain activities, for the cases studied.

2.5.2 Financial performance

The financial performance model was chosen to represent the influence of supply chain activities on the prosperity, financial growth and viability of an organisation. There were not many instances in the literature where financial indicators were used to measure the performance of supply chains. As the SCOR model did not address the element of sales, it was necessary to use a financial performance model in conjunction with the operational model to get a complete picture.

The most commonly used financial indicators, both in academia and in practice, were the income statement and balance sheet. This research study used the standard financial accounting indicators, as used by almost all organisations across the world, thereby easily establishing a benchmarking platform for the cases. The elements of the income statement and the balance sheet are shown in table 2-16.

Financial indicator	Element
Income statement	Sales
	Sales returns & allowances
	Cost of goods sold
	Selling, general & administrative expenses
Balance sheet	Inventories
	Accounts receivable
	Cash & cash equivalent
	Property, plant & equipment
	Accounts payable

Table 2-16: Elements of financial indicators
Source: Compiled from Needles, Powers & Crosson (2008)

Needles, Powers & Crosson (2008) defined the above financial indicators in detail.

Sales: Sales referred to total amount collected for goods and services provided. There were strict accounting guidelines for the recognition of sales (depending on the transaction and payment received).[62]

Sales returns and allowances: Sales returns and allowances referred to goods given back to the seller (manufacturer) because of defects. Sales returns was a contra revenue account.[63]

Cost of goods sold (COGS): COGS referred to an income statement figure that reflected the cost of obtaining raw materials and producing the finished goods that

[62] The condition to recognise sales was that that the payment transaction was or could be quite easily realised. In addition, delivery of the good or service had to take place for a sale to be recognised.
[63] Contra revenue referred to negative sales or negative income.

were sold to consumers. COGS considered the elements of initial product inventory, net purchases of products and final product inventory.

Selling, general and administrative (SG&A) expenses: SG&A expenses referred to income statement items that represented supply chain administrative expenses.[64]

Inventories: Inventories referred to a firm's raw materials, work-in-progress (WIP) and finished products that were not yet sold.

Accounts receivables: Account receivables referred to the billing of customers who owed money to the organisation for goods and services that had been provided.

Cash and cash equivalents: Cash and cash equivalents referred to cash on hand, bank balances, and negotiable money orders and cheques.

Property, plant and equipment: Property, plant and equipment included assets[65] that were written off against profits over their anticipated lifetime.

Accounts payable: Accounts payable referred to a balance sheet item that reflected money that was owed by the organisation and was due to its suppliers within one year.

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[64] Administrative expenses included salaries, commissions and travel expenses for executives and salespeople, advertising costs and payroll expenses.
[65] Assets included land, buildings, machinery, furniture, tools and wasting resources.

2.5.3 Governance performance

Dimitrijevic (2009) highlighted the concerns regarding governance issues in developing countries.[66] As mentioned earlier, the SCOR model did not further address the elements of HR, marketing and IT. It was necessary to consider these elements in order to obtain a complete set of supply chain issues generated by transnational factors.

Orphanides (ed.) (2005) stated that a governance model with a balanced set of supply chain features could represent a platform to compare competing supply chains. Bitran, Gurumurthi & Sam (2006) explored emerging trends in supply chain governance with focus on social trends, information technology, supply chain structure and integration. They analysed the supply chain governance model that was applicable across various industry verticals. Jain & Dubey (2005) analysed the supply chain partnerships from an inter-organisational perspective. Richey, Roath, Whipple & Fawcett (2009), however, defined a supply chain governance model focussed on both internal and external integrations.

Such a governance model could also provide a structured approach to identifying the gaps, and highlighting and categorising the issues facing the operation of supply chains. An example of a governance model for a generic supply chain is shown in figure 2-27.

[66] Dimitrijevic, however, mentioned that corporate governances were increasing with the developing countries, while lacking in the developed countries with the known cases such as Enron, Parmalat and Worldcom. Satyam was such of a similar case from India.

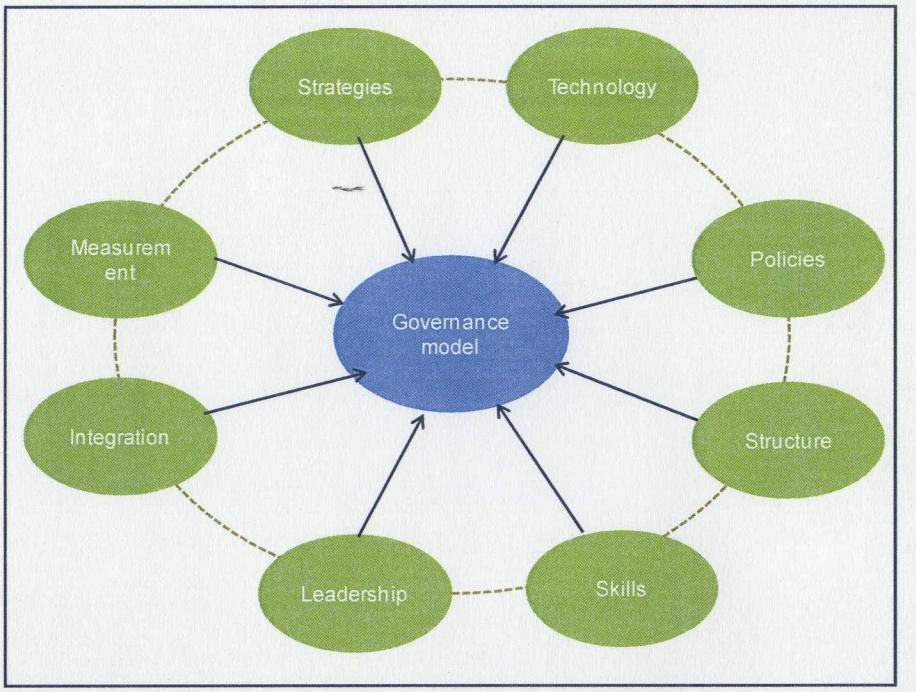

Figure 2-27: Supply chain governance model
Source: Compiled from Jain & Dubey (2005), Orphanides (ed.) (2005) and Bitran, Gurumurthi & Sam (2006)

This research study used the above governance model to represent the supply chain features that were not covered either by the SCOR or financial model.

A combination of all three performance models – operational, financial and governance – presented a unique opportunity to identify, compare and benchmark the issues faced by transnational FMCG supply chains.

2.5.4 Benchmarking supply chain

A host of knowledge about supply chains was available that could be used to benchmark any supply chain activity, although careful attention, such as understanding the definition and underlying assumptions of the KPI, was required during the benchmarking process. The benchmarking process was defined as follows by American Productivity and Quality Control (APQC) (2003:50):

"Benchmarking is the practice of being humble enough to admit that someone else is better at something, and being wise enough to learn how to match them and even surpass them at it."

Anderson, Fagerhaug, Randmacel, Schuldmaier & Penninger (1999) presented a benchmarking process for supply chains with the focus on measurement, comparison, learning and improvement. Their benchmarking process used a five-step approach, including planning, searching, observing, analysing and adapting.

The researcher did not intend to conduct a full-scale benchmarking exercise, but used the benchmarking framework available in the SCOR model to compare the identified issues and recommendations made by this thesis.

2.6 Transnational

The literature was explored for a definition of the term "transnational" and for an exposition of the factors and issues affecting transnational supply chains and the latest trends within these supply chains.

2.6.1 Definition

Soanes, Stevenson & Hawker (eds.) (2008) in the *Oxford English Dictionary* defined "transnational businesses" as businesses extending beyond national boundaries. From a supply chain perspective, for the purposes of this thesis, the term "transnational" was defined as the presence of supply chain operations beyond the borders of a country.

From an economic perspective, the World Bank (2006) defined "transnational" in terms of its different forms, i.e. international trade, FDI and capital flows. Transnational, from a humanity perspective, was also defined as a social movement grown out of the heightened interconnectivity among people all around the world and the loosening of boundaries between countries. The flow of goods across the boundaries of a country was found to be of an increased relevance because of globalisation, and transnational monetary and information flows.

"Transnational" was different from the term "international" in the sense that international affairs were governed by the governments of national states,

whereas transnational affairs were often beyond national government interference.[67]

The term "transnational" was vaguely used in a supply chain context, and other terms such as "global", multinational" and "international" were commonly used. The table below define these terms in detail.

Term	Definition	Distinguishing criterion
Transnational Supply Chain	Supply chain extending beyond the borders of a country	Most of the supply chain operations in a nation; only a small segment extending beyond a nation's geographic boundaries
International Supply Chain	Supply chains between or among two or more nations	Supply chain operations almost equally established between two or among more than two nations.
Multinational Supply Chain	Supply chains with operations in multiple nations	Supply chains not having a major component in a single nation

Table 2-17: Definitions of different types of beyond-nation's supply chains
Source: Compiled from Kumar (2004), Christopher (2005) and Soanes, Stevenson & Hawker (eds.) (2008)

This thesis defined a transnational supply chain as:

"A supply chain that carried out supply chain operations beyond the geographic boundaries of a country."

However, this study used the terms "transnational", "international", "global" and "overseas" interchangeably as the respondents from the cases and the readers of this thesis might not be aware of the fine differences among these four terms. [68]

[67] Bourne, who coined the term "transnational" in 1916, supported his view with a discussion of movement between the North and South American nations.
[68] "Global" referred to trading with all other countries in the world and "overseas" referred to trading with a country separated by sea.

2.6.2 Elements of and factors affecting transnational supply chains

Global Supply Chain Associates (2005) stated that classic supply chain operations could either be a combination of sourcing, manufacturing, distribution or having a customer base in the transnational economy.

This thesis used the following elements to characterise a transnational supply chain:

"international suppliers, manufacturing plants, DCs and customer base."

An organisation's transnational operations were greatly influenced by local factors such as political and economic factors (e.g. taxes on corporate income and local content) (Easton, 2003). They were further influenced by international factors such as costs (labour, space, freight and foreign exchange), customs duty (transfer pricing and suspension), taxes (a country's mark-up and subsidies), export regulations and time (lead, cycle, transit and customs clearance) (MacDonald, 2004, Christopher, 2005 and Vorley, 2006).

Further transnational factors identified in the literature were changing customer demands and international regulations, safety, different cultures and international logistics (Portes, 1999, Jiang, 2002, Yao & Song (ed.), 2002, Lewis, 2007, Kumar, 2009a, Kumar & Bala, 2009). The identified set of factors created specific issues within transnational supply chains, and these are discussed in the next subsection.

2.6.3 Issues within transnational supply chains

The influence of transnational elements and factors on the operations of supply chains was studied, and the issues created by them were identified and listed in this section.

Transnational supply chains required global synchronisation among the various entities that make up a specific corporation and its activities. In addition, Gallois, Devulder & Ferreira (2000:63) stated that:

> to be a complete transnational was to be a responsive organisation, with manufacturing and delivery processes that were very reliable, with optimised physical flows, instate a flexible industrial tool and with polyvalent industrial flows (people and machines).

A transnational organisation required that organisational and information management was simple and straightforward with optimal management of the stocking areas (Denise, 2009). Christopher (2007) identified the trade-offs among inventory costs, production costs and service levels as the most critical issue within transnational supply chains. This led to a trend towards focused factories, the centralisation of inventories, postponement and localisation. Friedman (2007) agreed with this and added that further challenges included extended lead times of supply and transit times, unreliable service levels, and multiple transport mode and cost options. Yao & Song (eds.) (2002) stated that the interests of participating parties were damaged and supply chains were impacted because of inefficiencies in the supply chains caused by the challenges mentioned above.

Morgenstern (2006) stated that when organisations searched for low-cost manufacturing locations, they were required to work on supply base localisation too, avoiding those locations that created lead time and inventory burdens on their supply chains.

High velocity supply chains were those in which a product moved rapidly from a manufacturer to a customer (as was the case with FMCG supply chains). Londe (2006) stated that operating a high-velocity supply chain on a global platform was uneconomical and unrealistic, and globalisation forced supply chains towards a lower velocity and increased costs. Lee & Ng (1998) and Sahay & Mohan (2003) explored the use of technology in transforming global supply chains and stated that, geopolitical realities however hampered this initiative.

It was found that supply chains were becoming complex in every dimension. Schlegel & Smith (2009) stated that one of the factors was the increased geographic complexity of supply chains as manufacturers tried to source materials globally. This created a requirement for a new approach towards supply chain excellence, identified as the need for a dynamic on-demand supply chain.[69]

When they became transnational, supply chains became a mixed blessing for sourcing managers. The convergence of communication and computing along with globalisation created seemingly infinite possibilities for sourcing. However,

[69] It required supply chains to be global and to be assessed by anyone across the world with such effects as responsive in real time and variable cost structure, and focus on their core and differentiating offering around the world.

Seshadri (2005) stated that the creation of so many sourcing possibilities was bound to cause goal conflicts and specific issues in a supply chain.

Bartlett & Ghoshal (1998) stated that transnational trading activities led to prosperity by initiating new economic avenues for sourcing, producing and selling goods worldwide, if organisations were able to blend their strategic posture with the dominant industry characteristics and adapt to changing customer demands.

MacDonald (2004) highlighted the issues raised by the exploitation of labour as a result of transnational activities due to many nations' low governance standards. Also, the use of worldwide best practices created a new set of issues.

As organisations looked at low-cost countries to reduce labour and production expenses, the popularity of low-cost country sourcing (LCCS) continued to rise. Vorley (2006) stated that governments were not yet able to create transnational organisations as a sustainable and risk free platform. Kumar & Bala (2009) highlighted the risks/challenges presented by an LCCS exercise (see table 2-17).

Common LCCS risk considerations	
Country Risk	• Political stability • Cultural/social congruence • Prevalence of corruption • Healthcare infrastructure and obligations • Degree of unionization • Infrastructure maturity • Intellectual property protection
Loss of Competitiveness Risk	• Exchange rate volatility • Input cost volatility (e.g. labour and energy rates)
Execution Risk	• Risks related to the safe and timely physical transportation of goods • Product quality risk

Table 2-18: Risks with low-cost country sourcing
Source: Adapted from Kumar & Bala (2009:55)

The risks of an LCCS exercise included political instability (as was evident in India because of its coalition government), poor healthcare infrastructure (as in India and South Africa), the degree of unionisation (which was evident in India and South Africa), exchange rate volatility (both the Indian rupee and the South African rand were very dependent on the US dollar), high input costs (energy prices have gone up in both countries) and product quality risk (compared with international regulations).

Most transnational supply chains, as identified in the literature, operated in only one supply chain segment such as sourcing or manufacturing. Blackhurst, Wu & Craighead (2008:53) stated that the distributed entities in a supply chain often worked towards their own goal and this resulted in sub-optimising the integrated system:

> Conflicts in supply chain systems put a firm's supply chain at risk and thereby, increase its level of vulnerability. These conflicts can disrupt the operation of a supply chain and affect customer metrics such as on time delivery and quality. Because of the potential for conflict in supply chains, practitioners have spent significant effort and money to implement safety mechanisms such as expediting orders, frequent checking of order status and buffer inventories.

Kumar (2009a) made the connection between the structure of the various trade regimes and supply chains. He stated that local regulations and tariffs created barriers to effective transnational trade. He also referred to the requirements of an adequate regulatory framework, batch traceability, supply chain integration,

product development and innovation, short lead times, and changing markets as the challenges of FMCG firms operating in a transnational supply chain context.

2.6.4 Issues with transnational supply chains in emerging economies

Mishra (2008) identified some of the transnational issues affecting supply chains from the Indian perspective. Indian supply chains were not aligned with the latest models and were based on such traditional ways of doing business as the use of carrying and forwarding agents (CFA), which created additional complexity.

Easton (2003) discussed global supply chains in China with a view to identifying and understanding supply chain challenges. The challenges identified included inadequate services, fragmented logistics systems, a legacy of local protectionism, few third-party capabilities and numerous anachronistic laws. China's geography also presented an additional challenge, since its western and interior regions (where two-thirds of the population live) were largely inaccessible. Jiang (2002) and Liu & Brookfield (2006) discussed similar issues with supply chains in China such as the difficulty of locating qualified local suppliers, an under-developed IT and telecommunications infrastructure, an unreliable transport system in many areas and high rates of damages/losses in transit.

Magretta (1998) discussed the Hong Kong supply chain management style based on her interview with Victor Fung.[70] She stated that one of the aspects that caused

[70] Victor Fung was the member of Li& Fung Firm in China and also chairman of a privately held retailing arm of the firm, which focuses on joint ventures with Toys R Us and the Circle K convenience-store chain in Hong Kong. He was also chairman of the Hong Kong Trade Development Council and of Prudential Asia.

supply chain management to make its way onto chief operating officers' (CEOs) agendas was the restructuring of global competition and supply chains.

In summary, it became clear that transnational supply chains were faced with a host of operational issues ranging from longer lead times to trade regulations. Surprisingly, financial and governance issues were not commonly referred to in the literature. During the field research with the FMCG cases, the list of operational issues was further reflected on and financial and governance issues were identified.

2.6.5 Trends in transnational supply chains

The latest trends (as of 2009) were identified regarding transnational supply chains in order to expose the gaps and to recommend best practices/benchmarks with respect to the issues identified in the previous section.

The latest trends were identified regarding supply chain strategy, globalisation, measurement, outsourcing, supplier consolidation and environmental concerns (Waters (ed.), 2007).

Supply chain strategy: Porter (1996) and Stacey (2007) stated that a well-developed supply chain strategy enabled organisations to focus on different activities or to carry out activities better than their competitors. Prahalad & Hamel (1990) described these strategic features or activities as the core competencies of an organisation. Porter (1998) identified two such generic strategies – cost leadership and product differentiation – in order to address the core competency requirements of an organisation.

Globalisation: Leontiades (1998) stated that all major organisations of the 20th century operated globally. However, Moran (2006) stated that globalisation was mostly restricted to business between subsidiaries of the same organisation. However, many factors forced organisations to operate globally, such as sourcing from low-cost countries, increases in their customer base and customer demand, economies of scale and the implementation of free trade arrangements such as SACU, BIMSTEC, EU and NAFTA. Ohmae (2002) called these global selling operations "Californianisation". Haydock (2003) pointed out that supply chain

intelligence was required to achieve higher growth rates and reduce costs for global supply chains.[71]

Appropriate measurements: Rushton, Baker & Croucher (2006) and Lofstock & Foucher (2009) stated that supply chain managers should use an adequate set of measurements to assess the efficiency of their operations, such as cost as a percentage of firm sales, overtime hours as a percentage of total hours, the number of order-pick errors, the availability of back orders, the proportion of orders satisfied in full, the amount of damage and service lead time.

Outsourcing: Some of outsourcing trends included outsourcing manufacturing to China, special support services such as call centres to India and R&D to Europe. The Eye for Transport (2009) survey stated that almost 60 percent of Fortune 500 firms outsourced some logistics to third-party logistics (3PL) service providers. A survey conducted by Barloworld Logistics (2009) in South Africa indicated that FMCG firms would like to outsource their supply chains because they wanted to focus on their core competencies and, secondly, would like to reduce their logistics costs. However, Aramal, Billington & Tsay (2004) cautioned that outsourcing could result in the parent organisation losing control of its supply chains. Richards (2006) also had doubts about the benefits of outsourcing. Sometimes 4PL firms were used to administer several 3PL contracts.

Consolidation and localisation of suppliers: New techniques such as collaboration forced organisations to strategically liaise only with a few key

[71] Haydock (2003) described supply chain intelligence in terms of demand intelligence, logistics intelligence, supply-and-demand alignment, production-and-process intelligence and supplier intelligence.

suppliers. Lamming (1993) stated that this eventually reduced the number of suppliers used, as illustrated by Rank Xerox, which reduced its suppliers from 5,000 to 300, while Ford reduced its suppliers from 4,000 to 350. Also, a survey conducted by Barloworld Logistics (2009) stated that FMCG firms were returning to localised sources of supply because of cargo security and physical logistics infrastructure challenges.

Increasing environmental concerns: In research conducted by the World Research Institute, Calleri, Hauff, Mahler, O'Keefe, Allusi & Cassara *et al* (2008:1) stated:

> Environmental concerns are driving a global trend of policy activism and regulation. Our scenario describes this trend and the most pressing environmental challenges, and finds that the earnings of consumer goods companies are exposed to significant risk rising out of their supply chains.

The Barloworld Logistics (2009) report referred to supply chains going lean-green, with increasing transportation efficiency, a reduction in packaging, recycling and the strategic location of DCs with ROI between two to 10 years. Based on the carbon footprint of the various FMCG organisations, the carbon emissions of the FMCG industries of the two countries were obtained which suggested that carbon emissions as a percentage of total carbon output were higher for a corresponding lower manufacturing base (shown in figure 2-28).

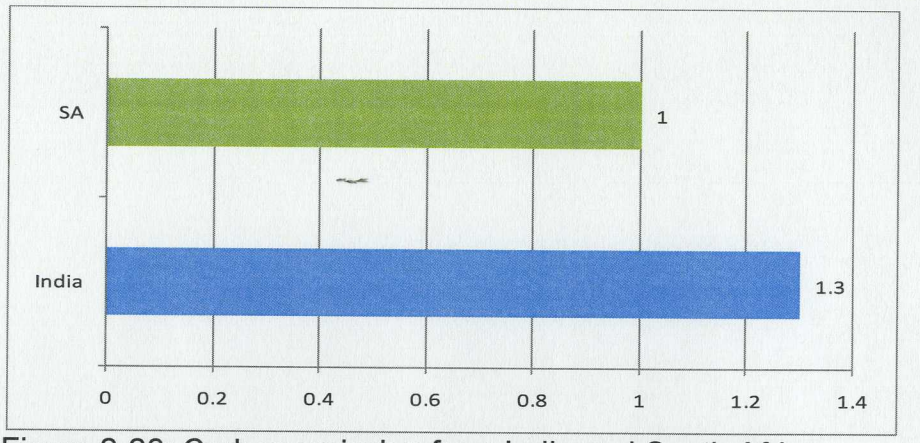

Figure 2-28: Carbon emission from India and South Africa
Source: Compiled from CII (2005) and King (ed.) (2008)

Risk management: Craighead, Blackhurst, Rungtusanatham & Hanfield (2007) described supply chain risk management as unavoidable and recommended that organisations adopt policies to tackle disruptions. They stated that supply chain density and complexity were directly related to the severity of supply chain disruptions.

Ostby (2009:203) compared disaster relief programmes from a supply chain point of view. He stated:

> Maybe disaster relief failures simply are supply chain issues. Like supply chain processes, both natural and man-made disasters are difficult to forecast. To best prepare, communities need to establish an executable plan of action; have dependable suppliers, maintain the best relationship possible with those suppliers; and make sure that, when a disaster occurs, community leaders deliver the most accurate quantity of necessary resources in a timely and efficient manner.

Collaboration: Danese (2006) recommended that FMCG firms should use collaborative processes to harness planning efficiencies and reduce supply chain costs. Kumar & Bala (2009) stated that collaboration was different from mere information sharing, as it involved the joint development of plans by the partners concerned. The details are presented in Appendix D4.

Decker & Van Goor (2000) used four levels of integration when discussing collaboration, i.e. physical, information, control and infrastructure. Also, four models of collaboration were identified (further details are presented in Appendix D5):

- Quick response (QR): O'Sullivan (1997), Joerg (2006) and Cheng & Choi (eds.) (2009) referred to QR or ECR - enabled organisations that could respond quicker by communicating faster and at a lower cost.
- Continuous replenishment (CR): Dupre & Gruen (2004:458) described CR as "a business process and strategy where channel members form mutually beneficial relationships [by sharing of PoS data and jointly preparing shipments intervals] to bring better value to the end customer".
- Vendor managed inventory: VMI was seen as a more sophisticated strategy than QR and CR, where a supplier was responsible for some or all of the inventory functions on behalf of a customer (Duffy & Andrew, 2004).
- Collaborative planning forecasting and replenishment (CPFR): CPFR enabled supply chain partners jointly to plan some or all key activities, from the production of raw materials to the sale of finished products (Danese, 2006).

2.7 Steps taken by supply chain managers to deal with specific issues

2.7.1 Old and new initiatives

Bovet (2008) identified the challenges faced by supply chain managers with regard to co-ordinating a global supply chain such as language issues, cultural issues, service delivery issues and skills issues.

The old supply chain optimisation philosophies worked for many organisations in the past; however, new techniques were required to address the new set of global challenges. Deming (2000) with regard to total quality management, Hammer (1996) with regard to re-engineering and Braithwaite (1996) with regard to MRP all expressed their concerns about the ability of these techniques to deliver value in the new environment.

When managers started to recognise the importance of their function, supply chains developed very quickly. Aqunio & O'Marah (2009) stated that over 90 percent of organisations were improving their supply chains or planning improvements to them in the near future. Some of the steps that supply chain managers were focusing on were:

- reducing supply chain costs and identifying opportunities for savings (Francis & Grossman, 2009)
- focusing on customer service delivery (Rushton, Baker & Croucher, 2006)
- using new supply chain management techniques such as just-in-time (JIT), flexible operations, mass customisation and lean operations (Womack, Jones & Roos, 2007)

- using advanced technologies such as electronic data interchange (EDI), business-to-business (B2B), business-to-customer (B2C) and e-commerce (Chew, Orlov, Hudson & Herbert, 2003)
- focusing on supply chain partnerships and collaboration (Danese, 2006)
- concentrating on their core operations and outsourcing non-core operations to third parties (Christopher, 2007, Eye for Transport, 2009).

2.7.2 Best practices for outbound distribution

Some of the best practices for outbound distribution that supply chain managers could use were identified by Waters (ed.) (2007), as follows.

Postponement: Battezzati & Magnani (2000) gave the benefits of postponement in the FMCG industry with the concept of assemble-to-order. The personal care segment could use this technique to a larger extent compared to the packaged food segment due to the regulatory constraints faced by the latter. The final packaging and labelling could be performed closer to the customer base for personal care segment products.

Factory gate pricing: In order to focus on core competences, many organisations were moving towards ex-factory gate pricing, where retailers or customers were responsible for delivery from the factory gate through to the final customer. This would overcome the risk of overseas products re-entering the local market.

Cross-docking: The cross-docking approach was used to optimise transportation costs by co-ordinating supply and delivery through a hub and avoiding unnecessary storage costs.

Direct delivery: Depending on the shipment size and the customer's order requirements, it was often possible to ship the products directly to the end customer, skipping the intermediate storaging steps.

Smaller deliveries: Storage space constraints and the use of advanced supply chain optimisation techniques such as JIT, the agile approach, and direct deliveries led to smaller and more frequent deliveries.

Increasing vehicle utilisation: 3PL organisations had started using techniques such as combining multiple principles, reverse logistics and backhauls.

2.7.3 Focus categories

Supply chain managers were dealing with strategic, tactical and operational decisions. Based on the abovementioned initiatives and best practices for outbound distribution, the following categories were identified as being focus areas for the supply chain manager.

Manufacturing strategy: Vollmann, Berry, Whybark & Jacobs (2004) identified the challenges related to the number of plants needed, the location of the plants, what products to make, what process technology to use and what parts of the world the organisation should cover in order to find optimal inventory locations.

Supply base design/vendor consolidation: Nahmias (2004) identified issues related to suppliers such as how many suppliers to have for the same product commodity, which product to source from which supplier, whether any opportunities were missed by having a single source policy and how product quality was influenced by choice of supplier.

Outsourcing: Aramad, Billington & Tsay (2004) identified the challenges arising from outsourcing production. Questions such as what parts of the supply chain to keep "in-house", what parts to outsource and what additional value the outsourced production would provide needed to be considered.

Impact of duty/taxes: The challenges faced were the impacts of duty rates (WTO) on the supply chain design. The sourcing or production strategy in the ASEAN, Mercosur, BIMSTEC, SACU and NAFTA trading blocs and the use of tax havens such as Singapore, Mauritius, Puerto Rico and Ireland were some of the challenges identified.

New product pipeline design: Nahmias (2004) and Hugos (2006) identified the challenges related to new products such as new product design, and the sourcing and management of the new product.

Collaboration: Carter, Slaight & Blascovich (2007) investigated the number and nature of items and the information that could be collaborated on with suppliers and customers.

2.8 Summary

A plethora of literature was available on supply chains. However, clear and precise definitions for key terms and concepts were not available in the literature. This research study therefore developed definitions for the terms "supply chain", "FMCG industry" and "transnational" for its research purposes.

The goal of a supply chain was identified as that of trying to achieve a sustainable competitive advantage, and the organisations used a mix of supply chain structures. The FMCG industry had unique characteristics when compared with the hi-tech industry and was dominated by retailers as its main customers. In addition, the local trade regime influenced the supply chain setup in a country.

Only two product segments, packaged food and personal care, were chosen to be researched further. The models given in table 2-18 were identified as appropriate ones to analyse the transnational aspects of supply chains.

Requirement	Model
Understand the typology of the FMCG supply chains	Typology - functional and structural attributes
Issues impacting the performance of the supply chain	Operational - SCOR
Issues impacting the financials of an organisation	Financial – income statement and balance sheet
Issues impacting the governance of the supply chains and other aspects not covered by above two performance models	Governance – supply chain aspects

Table 2-19: Model used in the research

The roles and responsibilities of supply chain managers were changing because of the changing global supply chain landscape and the related global challenges. Operational issues regarding transnational supply chains that were highlighted ranged from longer lead times to trade regulations. The focus on financial and governance issues was limited in the literature.

In light of the above, it was imperative to identify the issues specifically faced by transnational supply chains within the FMCG industry. The transnational factors of the FMCG supply chains are summarised in figure 2-29 according to the SCOR model. The dotted lines in the below figure present a weaker influence for specific transnational factors on FMCG supply chains and these were therefore not researched in detail. The bold, unbroken lines representing stronger influence were researched in detail.

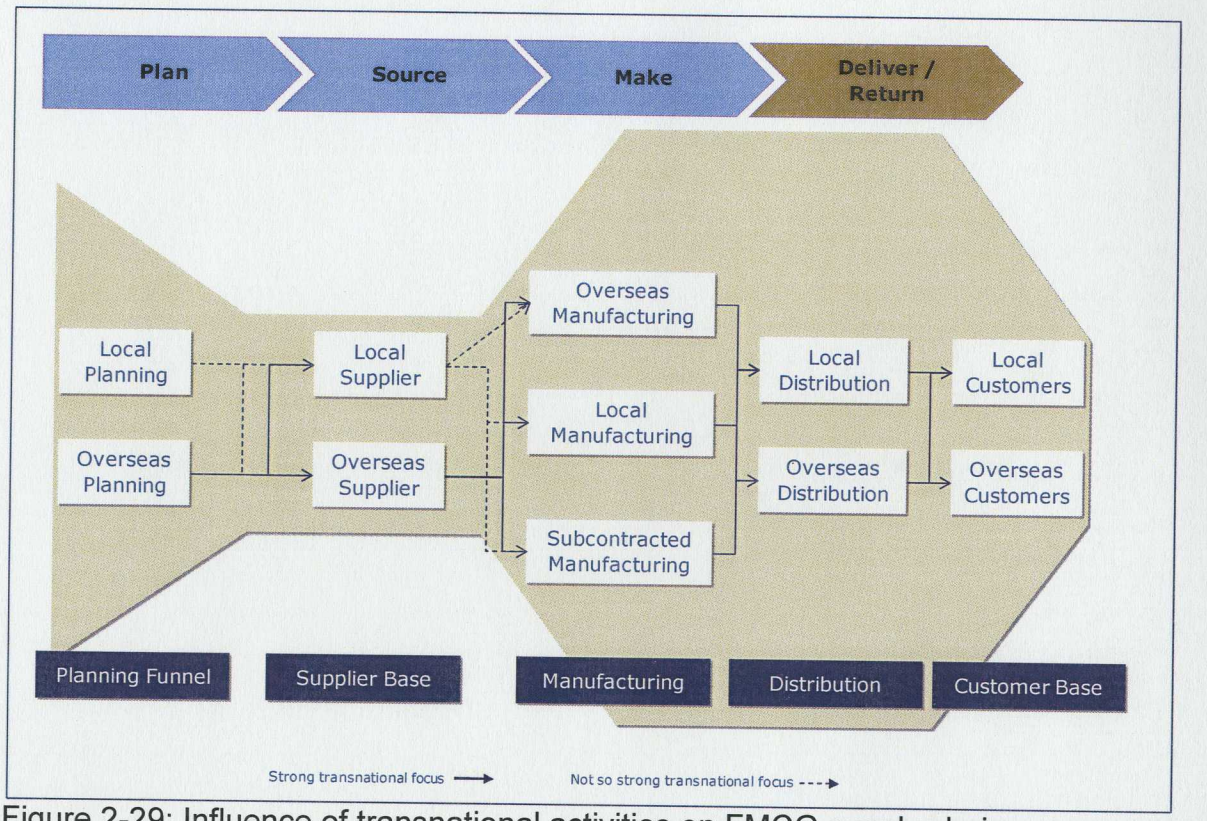

Figure 2-29: Influence of transnational activities on FMCG supply chains

In addition, the need to examine the steps taken by supply chain managers to deal with the issues facing them became evident.

2.9 Propositions

Based on the research questions and the literature review, the following propositions were proposed:

1. The typology of transnational FMCG supply chains originating in India and South Africa was not different to that identified in the literature.
2. The issues identified regarding transnational FMCG supply chains originating in India and South Africa were, but were 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.
3. Supply chain managers were taking the following key steps (among others) to address the issues affecting transnational FMCG supply chains originating in India and South Africa:
    a. adopting newer and more advanced technologies
    b. redesigning the supply chain organisational hierarchy
    c. investing in better measurement controls for 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.