

## E-BUSINESS IN THE SOUTH AFRICAN APPAREL SECTOR: A UTOPIAN VISION OF EFFICIENCY?

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### I. INTRODUCTION

**T**HE South African (SA) apparel sector has gone through a period of significant economic restructuring in the post-apartheid era. This is partly attributed to South Africa's increasing integration into the global economy following years of relative autonomy under the apartheid regime. This process of global integration, however, has been accelerated through the African National Congress' (ANC) Growth, Employment and Redistribution (GEAR) strategy, which was implemented in 1996 in the wake of a currency crisis. GEAR follows orthodox economic ideas focused on fiscal austerity and the promotion of trade liberalization, leading to increasing international competition, along with increasing opportunities for exports (Habib and Padayachee 2000). The key challenge thus confronting the SA apparel sector is not *whether* to participate in global processes, but *how* to do so in ways which provide for sustainable growth.

In the relatively small, captive SA market, competitiveness has previously revolved more around marketing effectiveness and price competition than production and systemic efficiencies. The small scale and volumes of the SA market perhaps made the viability of fully fledged business information systems questionable (Moodley 2002). However, the current pressures of globalization and the challenge to direct overseas market expansion underscores the importance of e-business for the local apparel sector. The integration of information and communication technology (ICT) systems within the firm and across the value chain has become a necessary condition for global competitiveness.

For decades, the SA apparel sector was sheltered by state protectionism and a policy favoring import substitution industrialization (ISI). In the post-apartheid era, however, the inwardly oriented apparel sector has become increasingly exposed to the cut and thrust of international competition as a direct result of a major shift in

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state policy to open markets, a rapid erosion of both tariff and non-tariff barriers and the implementation of an export-oriented industrial policy. The industry's drive for international competitiveness has, however, been problematic. Over the last decade, the apparel industry has experienced low productivity, massive formal sector job losses, firm closures, and a flood of cheap imported clothing, both legal and illegal, primarily from the Far East (Altman 1994; Dunne and Harrison 1998; Salinger et al. 1998). The convergence of these factors, resulting mainly from the pressures of globalization, the intensification of international competition, and rapid and sweeping trade liberalization, have led to a fragmentation of the garment manufacturing industry in South Africa. It has been estimated that 18,300 formal sector jobs were lost in the apparel sector between 1994 and 1999 (DTI 2000). This is problematic in a country like South Africa where there is limited alternative employment opportunities in the formal sector.

To grow and develop, SA garment makers need volume business and long-term pipeline relationships rather than one-off orders. The challenge for SA garment makers is, therefore, to develop and expand the export market, since an export-oriented growth path offers the most promise for becoming the key driver of employment and output growth in the industry. Local garment makers need to develop new and better networks with foreign buyers in order to compete with East and South Asian suppliers for the lucrative European Union (EU) and North American apparel market. Gereffi (2000, p. 48) argues that "to facilitate adjustment and indeed survival in a volatile, export-oriented sector such as apparel, industrial upgrading typically requires organizational linkages to the buyers and suppliers in developed country markets."

The challenge for SA apparel producers is, therefore, to develop close, tight linkages and fashion strategic alliances with global lead firms that control the high value added, more profitable design, and marketing segments in the buyer-driven apparel value chains.<sup>1</sup> In these full-package sourcing networks, the lead firms (i.e., retailers, branded apparel manufacturers and marketers) are the principal sources of technology transfer, knowledge, and material inputs. E-business could play an instrumental role in establishing and sustaining global linkages and in so doing, provide a lever for linking into export markets. Integrating into sourcing pipelines for major retail chains in the United States and the EU is crucial for the long-term growth of the SA apparel manufacturing sector.

Building and maintaining new sources of competitive advantage are crucial for local apparel producers to break out of the low productivity, low value-adding path in which they are currently locked into. The long-term challenge for SA garment makers is to achieve: (1) strategic agility, i.e., flexibility to adapt to changing market dynamics, evolving customer needs and new channels of competition; (2) tighter

<sup>1</sup> For more detail on buyer-driven value chains see Gereffi (1994).

control of inventory in their supply chains; (3) improved ability to dynamically respond to changing customer delivery requirements in the supply chain; and (4) better integration with input suppliers and buyers to efficiently adapt to fluctuating demand. To meet these challenges, buyers and sellers will need to forge closer partnerships to better manage logistics and supply chain management (SCM) in the garments industry.

The critical research question that arises is: Can e-business provide a necessary lever to enhance growth and competitiveness of the SA apparel sector? Time-to-market, for instance, has arisen as a critical competitive asset in the global economy, especially since shorter seasons, more rapid product cycle turnover, and smaller production runs are becoming the norm in the value-added, fashion-oriented segment of the global apparel market (Gereffi 1999). From a development perspective, this exploratory study is important because employment and export growth prospects for the local apparel industry hinge increasingly on leveraging ICTs as a means of promoting industrial upgrading within global value chains. Recent evidence suggests that sectors and countries that have experienced the most rapid diffusion of ICTs, have also experienced the most rapid rates of employment and output growth (Baily and Lawrence 2001; ILO 2001).

The paper is structured as follows. Section I sets out the research agenda. Section II attempts to develop an analytical framework in order to better understand what e-business entails. By defining the concept and laying out the parameters of e-business, we hope to be able to better assess its potential for the apparel sector. Section III discusses the research methodology that was employed in the study. Section IV provides an overview of the SA apparel sector, and critically discusses the potential of e-business for the SA clothing industry. Sections V and VI reviews the retailers' and manufacturers' experiences of e-business respectively. Section VII presents a set of development policy implications, and Section VIII concludes the study.

## II. E-BUSINESS: A CONCEPTUAL FRAMEWORK

Although the precursor of the internet appeared in the late 1960s, e-business is primarily a product of six significant transformations in the global economy: (1) the globalization of markets; (2) shift towards an economy based on knowledge and information;<sup>2</sup> (3) the growing prominence of ICTs in the economy; (4) innovations in business organization and practice (such as just-in-time production, total quality management, knowledge management, etc.); (5) the liberalization of the telecommunications sector in primarily OECD countries; and (6) technological innovations such as email, the World Wide Web, internet browsers, and the expansion in

<sup>2</sup> Quah (1997) calls this the "weightless economy" and Castells (2000) refers to this "new economy" as "informational capitalism."

Fig. 1. E-Business Matrix

	Government	Business	Consumer
Government	<b>G2G</b> (e.g., coordination)	<b>G2B</b> (e.g., information)	<b>G2C</b> (e.g., information)
Business	<b>B2G</b> (e.g., procurement)	<b>B2B</b> (e.g., e-commerce)	<b>B2C</b> (e.g., e-commerce)
Consumer	<b>C2G</b> (e.g., fax compliance)	<b>C2B</b> (e.g., price comparison)	<b>C2C</b> (e.g., auction markets)

the volume and capacity of communication networks (viz., optic fiber, digital subscriber line technologies and satellites) (Mansell and Wehn 1998; OECD 1999).

Among the principal technologies directly enabling modern e-business are: computer networking and telecommunications; client/server computing; multimedia, and hypermedia in particular; information retrieval systems; electronic data interchange (EDI); message handling and workflow management systems; groupware and electronic meeting systems; and public key cryptography. However, it would be incorrect to view e-business as a largely technological development. E-business is best understood as the deployment of information technology (IT) together with the organizational and management advances that pull the technology and are pushed by it in turn. The term e-business has no widely accepted definition. The author defines e-business as “any form of commercial or administrative transaction or information exchange that takes place via an ICT-based, computer-mediated network.” E-business is ultimately about using ICTs to harness the networks of trust, knowledge sharing, and information processing that takes place both *within* and *between* organizations (Davenport and Prusak 1998). E-business thus entails the application of the internet to the complete value chain of business processes.

The internet encompasses a wider spectrum of potential commercial activities and information exchanges than just trade among firms (B2B) or between firms and consumers (B2C) (Figure 1). For instance, it offers firms, individuals and governments an electronic infrastructure which enables the creation of virtual auction markets for goods and services where previously they did not exist. Ebay.com, for example, was among the first successful sites to provide a framework where consumers can trade a wide diversity of goods and services with each other (C2C), and, at least in principle, with businesses (C2B). The technology is also being used by governments to reorganize the management of public procurement systems over

the internet (B2G transactions), and also for transmission or receipt of information (G2B, G2C). Moreover, the internet is being used to lower the cost of payment systems and tax compliance for the general public (C2G).

This paper focuses exclusively on business-to-business (B2B) internet interactions. There are two main reasons for this emphasis: (1) our concern is primarily with the potential of the internet for optimizing inter-firm linkages in the value chain and (2) current trends seem to indicate that B2B e-commerce will far outstrip that of business-to-consumer (B2C) e-commerce globally (IBM 2000; Singh 2000). B2B transactions already account for as much as 80–90 per cent of all e-commerce transactions globally (Mansell 2001; UNCTAD 2001). According to the Gartner Group, world B2B e-commerce will grow from U.S.\$145 billion in 1999 to U.S.\$401 billion in 2000, and to U.S.\$7.3 trillion by 2004.<sup>3</sup> BMI-TechKnowledge, a market research consultancy, predicts that the B2B e-commerce market in South Africa will increase from R21 billion in 2000 to R87 billion in 2002.<sup>4</sup>

B2B e-commerce encompasses a range of electronic interactions between a firm and its upstream and downstream trading partners. B2B e-commerce refers to procurement, logistics, and administrative processes occurring between firms, and can be divided into two categories: “open marketplace-based trade” and “direct trade between business partners.” The former takes place at various internet-based auctions or exchange sites, whilst the latter occurs either through a firm’s website which has an online purchasing function or an EDI-type network.<sup>5</sup> It has been argued that B2B e-commerce is likely to spread globally and grow rapidly primarily because of its potential for: (1) reducing business costs (associated with inventories, sales execution, procurement and distribution); (2) connecting to markets through greater geographical reach; (3) value creation; (4) increasing productivity gains and systemic efficiencies in the value chain; and (5) advanced supply chain management and logistics (Moodley 2002).

Senn (1998) and Wiseman (2000) contend that inter-organizational e-business systems are rapidly becoming an essential mechanism for competitive success. Figure 2 illustrates an e-business system which satisfies the following conditions:

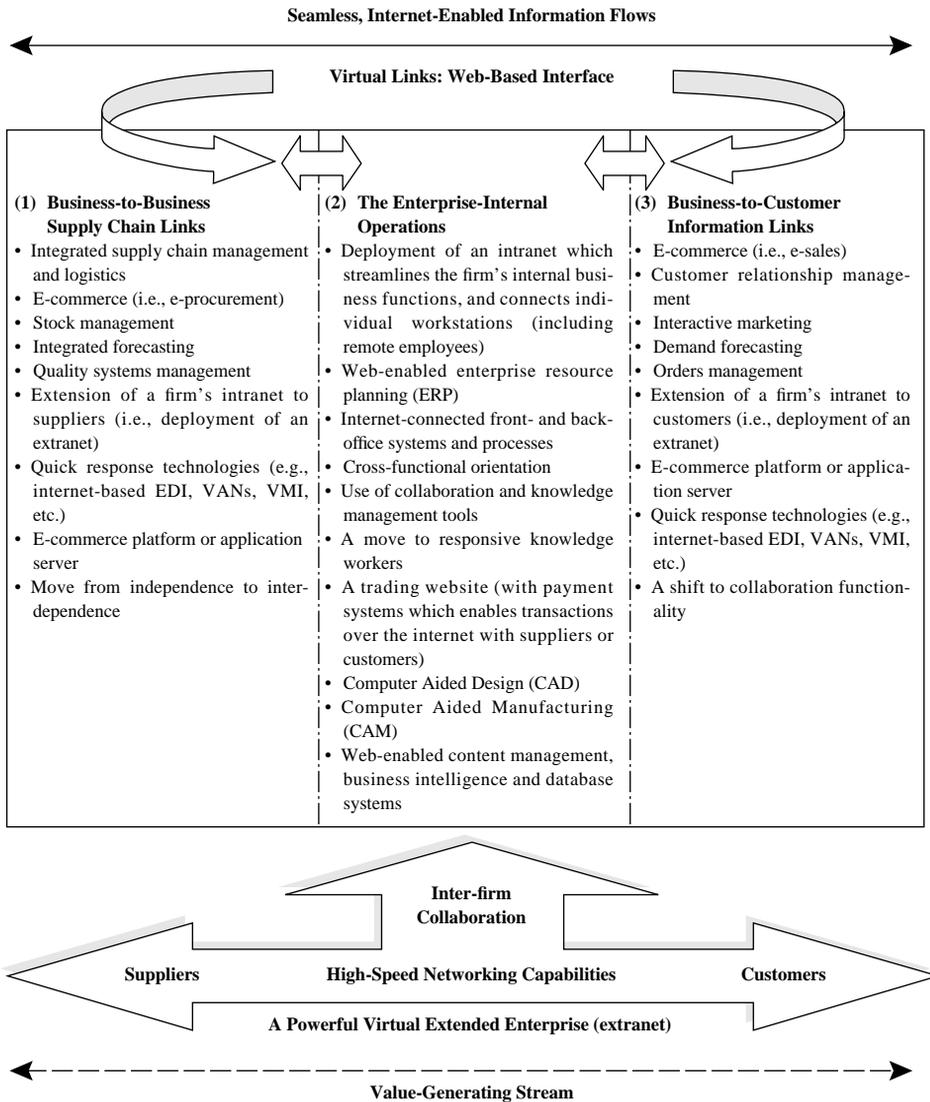
- High-speed networks within and outside a corporation’s own site for file transfer and e-mail;
- Electronic organization and communication of unstructured data with opportunities for response as in groupware; and
- Seamless transfer of information between potentially different systems used by customers, suppliers, and partners at various sites.

<sup>3</sup> See “Computers: Commercial Services,” *Standard and Poor’s Industrial Surveys*, January 25, 2001.

<sup>4</sup> See “E-business Runs on E-Intelligence,” *F & TNet* 4, no. 5 (2000), p. 30.

<sup>5</sup> Electronic data-interchange (EDI) can best be described as an inter-organizational computer to computer exchange of business documentation in a standard machine processable format (Sokol 1989). EDI takes place through proprietary, value-added networks (VANs).

Fig. 2. E-Business-Enabled Extended Enterprise



The backbone of the e-business system consists of extranet-based<sup>6</sup> information sharing and collaboration with suppliers (Figure 2, column 1) and customers (column 3), and the intranet<sup>7</sup> which supports the opening of the organizational data-

<sup>6</sup> Internet-based networks for use by a company and its business partners.

<sup>7</sup> Internet-based network for company-use only.

bases and data warehouses within the firm, dissemination of information on web pages, as well as team-oriented collaboration within the corporate firewalls (column 2). Viewed conceptually, Figure 2 shows how ICTs can be used to network economic activities and processes both within (column 2) and between (columns 1 and 3) firms, in order to reduce information-related transaction costs or gain a strategic, information advantage.

The value of B2B e-commerce for the apparel industry rests in three key areas: (1) increasing the efficiency of internal processes (maximizing operating synergies), (2) streamlining inter-firm linkages (exploiting systemic efficiencies), and (3) connecting to global markets. Apart from improving intra-firm and inter-firm process efficiencies, the internet can also play a key role in facilitating supply chain learning and innovation. B2B internet-based collaborative interactions and real-time communication is likely to sharpen the competitive edge of the participating firms, reduce information asymmetries, and improve the quality of information embodied in business relationships (Magretta 1998). The struggle for competitive advantage in the apparel industry will revolve around exploiting the *richness* and *reach* potential of the internet. Evans and Wurster (2000) state that *reach* is about access and connecting to customers and suppliers, i.e., deepening upstream and downstream linkages in the value chain, and *richness* refers to the depth and detail of information that the firm provides suppliers and customers, and is regarded as being important for building close relationships with trading partners.

The primary emphasis in much of the current debate about e-business is on the global nature of electronic markets, and the lower costs of reaching global markets (Montealegre 2000). Internet-based market structures, and more broadly, the extension of global telecommunication networks, appear to offer producer firms in developing countries new exchange mechanisms that will enable them to compete on a more equal basis in world markets (Goldstein and O'Connor 2000; UNCTAD 2001). It has been claimed that e-business has the potential to reduce information asymmetries and trade-related transaction costs, provide the firm with an international profile, and reduce market barriers inhibiting the growth of developing country exports (Benjamin and Wigand 1995; Malone and Laubacher 1998).

Our understanding of the firm as a monolith has been problematized by Coase's (1937) seminal paper. Transaction cost economics that arose from this work helps us see the boundary of the firm as defined by the equilibrium between the advantages of the lower transaction costs of internal production on the one hand, and the lower agency costs and economies of scale and scope of outside procurement on the other (Williamson 1975). Transaction costs have been described as the "costs of running the system" (Williamson 1985, p. 18), and are seen as the "economic equivalent of friction in a physical system" (Wigand 1997, p. 8). According to transaction cost theory, participating in a commercial exchange involves two types of costs (Milgrom and Roberts 1992; Garicano and Kaplan 2000). The first set is related to

problems of coordination. These costs generally are perceived as “arising from the need to determine prices and other details of the transaction, to make the existence and location of potential buyers and sellers known to one another, and to bring the buyers and sellers together to interact” (Milgrom and Roberts 1992, p. 29). Costs of this kind can be divided into four categories: (1) searching for products, services, sellers and buyers; (2) negotiating and fulfilling a contract; (3) ensuring the contract terms are met; and (4) adapting to changes during the tenure of the contract (Wigand 1997; Wigand, Picot, and Reichwald 1997).

The second type of costs is related to problems of actor motivation. Information asymmetries and incompleteness, and imperfect commitment are the two primary categories of transaction costs associated with motivation. Costs relating to incomplete or asymmetrical information occur when potential trading partners “do not have all the relevant information needed to determine whether the terms of an agreement are mutually acceptable and whether these terms are actually being met” (Milgrom and Roberts 1992, p. 30). Parties to a transaction incur motivation-related costs through the need to expend resources to monitor performance and to develop ways of enforcing compliance, such as contractual requirements and mechanisms of redress. They also must bear the costs of failing to enter into transactions that otherwise would have been mutually advantageous in the absence of information asymmetries and imperfect commitment.

Underpinning discussions about the potential of the internet to globalize commerce is the notion that e-business offers the hope of significantly decreasing the transaction costs associated with trade across organizational and geographical boundaries. According to Malone, Yates, and Benjamin (1987, p. 484), the adoption and implementation of ICTs facilitates a “closer integration of adjacent steps in the value-added chain,” thereby allowing firms potentially to reduce the costs associated with selecting suppliers, negotiating and fulfilling contracts, and ensuring that contract terms are met. This reduction in the “unit costs” of coordination, it is claimed, will encourage firms to expand the number of transactions they conduct across both organizational and geographical boundaries (Benjamin and Wigand 1995; Davidow and Malone 1992; Malone and Laubacher 1998).

Wagner (1998) argues that lack of coordination between firms within a value chain can create considerable inefficiencies. His empirical study found that e-business technologies such as the internet and EDI provide an opportunity to reduce these inefficiencies. The company that optimizes and coordinates links with its suppliers and customers can create competitive advantage. In other words, investment in IT will be profitable to SA apparel firms despite their apparent weaknesses in comparative advantages in terms of labor cost against global competitors. E-business represents potentially a new means of value adding and value creation for apparel firms. It has both an internal orientation (facilitating value activities) and an external orientation (linking value activities with suppliers and customers).

To summarize, B2B networks and the internet have great potential to reduce transaction costs and to increase the scope of inter-organizational and international trading. Clearly, e-business can drastically reduce the costs of making “the existence and location of potential buyers and sellers known to one another” (Milgrom and Roberts 1992, p. 29). Moving segments of the supply chain to the internet offers a major promise in raising economic efficiency of both the apparel manufacturing and retail sectors. How, whether, and on what terms the application of, and access to, e-business technologies are likely to enable a reduction in overall transaction costs that is sufficient to facilitate entry into new (and existing) global markets by developing country apparel producer firms is, of course, a subject for empirical investigation.

### III. METHODOLOGY

The basis of the empirical data and analysis that follows is a series of open-ended, face-to-face interviews with twenty-one apparel manufacturers (Appendix Table I), seventeen national retail chains (Appendix Table II), and fifteen industry experts. The interviews were conducted by the author between January and March 2001.<sup>8</sup> The panel of industry experts included representatives from academia, government, trade unions, business associations, NGOs, the Export Council, and business, marketing, and IT consultancies. The firm-level interviews were held with respondents who were either IT, marketing, purchasing, planning or merchandising directors.

The SA retail sector is highly concentrated, and the bulk (approximately 70 per cent) of the retail market is controlled by the seventeen chains that were interviewed (Appendix Table III). The sample of manufacturers were drawn from the three major centers of apparel production in South Africa, i.e., Durban, Johannesburg, and Cape Town. The manufacturers were identified through the Clothing Federation handbook (CLOFED 2000) and through leads provided by the key informants. On the basis of the experts’ recommendations we decided to target large manufacturers, especially those who are currently exporting, as well as the major national retail chains. Based on their experience, the experts believed that these large enterprises were more likely to: (1) have a fairly sophisticated IT infrastructure; (2) be trading online; and (3) have an e-business strategy. Moreover, the lead firms in the apparel value chain are strategically placed to provide industry-wide insight into the prospects and uptake of e-business.

<sup>8</sup> Confidentiality agreements with the respondents prevent us from identifying the manufacturers, retailers, and key informants that were interviewed.

#### IV. DOES E-BUSINESS MATTER FOR THE SOUTH AFRICAN APPAREL SECTOR?

##### A. *An Overview of the SA Apparel Industry*

After decades of state protectionism, the SA apparel industry has entered a global market in which it has to compete with low-priced imports from developing countries, besides exporting its own goods and strengthening its technical and marketing expertise to compete more effectively in quality and price. Formerly sheltered from the need to compete and with effectively guaranteed markets due to apartheid sanctions, local manufacturers have suddenly had to face more expensive raw materials and labor costs, as well as low productivity and outdated machinery (House and Williams 2000; Velia 2002). As other countries have moved their production and labor-intensive work abroad, South Africa has been left behind. Moreover, since import protection barriers were lowered during the post-1994 economic liberalization, the industry has been hit hard by cheap imports, both legal and illegal, especially from the Far East and other African countries.<sup>9</sup>

As a result of these competitive pressures, the SA clothing industry has been forced to rationalize and modernize. Many small manufacturers have either closed down or moved to lower-wage areas, while the bigger players have downsized (House and Williams 2000). Like many other developing countries, South Africa will have to find niche products in order to compete, and manufacturers need skilled labor and modern machinery. Economies of scale are vital, now that producers can no longer sell at artificial prices. Local companies will need to reduce their ranges and produce value-added goods for niche United States and European markets.

Table I compares productivity and labor cost among the Southern African Development Community (SADC) and a few selected Asian countries; the reference garment is a men's casual shirt. Productivity is stated as the number of pieces per operator per day. For export markets, labor cost per unit is one of the critical factors for cost competitiveness in garment manufacturing. Productivity and labor-cost comparisons demonstrate that SA manufacturers are not competitive with their counterparts in the Far East and South Asia (Table I). For example, labor in South Africa costs nine times as much as in Malawi (Coughlin, Rubin, and Darga 2001, p. 41). South Africa would have to achieve the nearly impossible productivity levels of about thirty-four garments per operator per day for the reference garment to be competitive with China. It is important to bear in mind that the labor costs in South Africa are for those firms operating in urbanized areas, where there are active labor unions. Foreign investors and emerging entrepreneurs, however, are setting up operations in rural decentralized zones where unions are not active, and employers are

<sup>9</sup> See "Clothing and Textiles—A Sector Assessment," *Indicator South Africa* 18, no. 4 (2001).

TABLE I  
PRODUCTIVITY AND LABOR COST COMPARISON FOR MEN'S CASUAL SHIRT

	Pieces per Operator per Day	Productivity Rank (1 = Highest)	Monthly Salary (U.S.\$)	Monthly Salary Rank (1 = Lowest)	Unit Cost for Assembly (U.S.\$)
Malawi	10.5	8	26.0	1	0.11
Mozambique	10.5	8	44.0	2	0.19
India	16.0	5	72.5	5	0.21
Kenya	13.5	7	62.5	3	0.21
Lesotho	18.0	4	87.0	7	0.22
Zambia	10.5	8	60.4	4	0.26
Mauritius	18.0	4	108.0	9	0.27
Zimbabwe	13.0	7	80.0	6	0.28
Tanzania	10.5	8	72.0	5	0.31
Swaziland	15.0	6	105.4	8	0.32
China—EPZ	20.0	1	150.0	11	0.34
Botswana	15.0	6	139.0	10	0.42
Namibia	10.5	8	167.5	12	0.73
South Africa	15.0	6	248.0	13	0.75
Thailand <sup>a</sup>	19.8	2	n.a.	n.a.	n.a.
Taiwan <sup>a</sup>	18.2	3	n.a.	n.a.	n.a.

Source: Coughlin, Rubin, and Darga (2001).

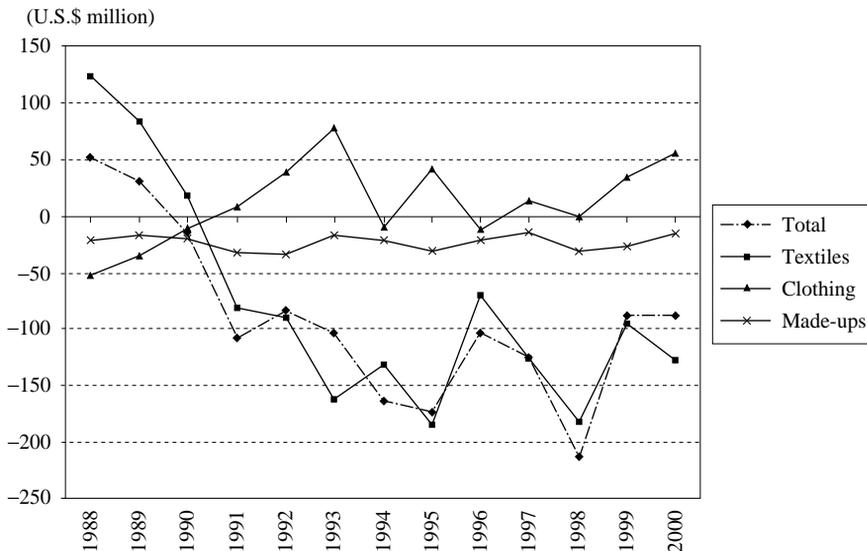
Note: Countries are listed in order by unit assembly cost, from lowest to highest. Productivity data (pieces per operator per day) for Malawi, Zambia, Mauritius, Namibia, and Tanzania are estimates. Unit costs are calculated assuming a month of 21.8 days.

<sup>a</sup> Monthly salary figures for Thailand and Taiwan are unavailable. Productivity data are shown for comparison only.

able to negotiate wages as much as 50 per cent below the minimum wage of R192 per week (Cotton Board 2001, p. 2). Another important caveat is that SA garment manufacturers have a potential cost advantage over South Asia and China as a result of the duty-free privileges available under the U.S. African Growth and Opportunity Act (AGOA) and the European Union Agreement (EUA).

Competition in clothing production today is much more than comparative labor cost: it involves the ability to respond efficiently to frequent shifts in the supply chain and to stringent demands imposed by customers often arising from lean retailing practices and the consumers' changed preferences (Abernathy et al. 1999). The exigencies of short-cycle production and fast time-to-market are becoming increasingly important in global apparel trade (Gibbon 2001). Individual apparel firms, either by finding specific market opportunities or by implementing better business and production systems, can become competitive in global markets despite high labor costs. Moreover, notwithstanding high labor costs, South Africa has a comparative advantage in product design and marketing, yarn and fabric production, and high-end fashion apparel (Coughlin, Rubin, and Darga 2001, p. 56).

Fig. 3. Clothing and Textile Trade Balances for South Africa (1988–2000)



Source: Calculations based on data obtained from the Trade and Industrial Policy Strategies (TIPS) database, <http://www.tips.org.za>.

Note: Clothing comprises both knitted or crocheted apparel and clothing accessories (HS 61), and articles of apparel and clothing accessories which are *not* knitted or crocheted (HS 62). For textiles, we used the HS 51 (wool and animal hair), HS 52 (cotton), HS 54 (man-made filaments), and HS 55 (man-made staple fibers) categories. For “made-up” goods, the HS 63 category was used. The HS 63 category includes “other” made-up textile articles, sets consisting of woven fabric and yarn, worn clothing and worn textile articles, and rags.

Figure 3 illustrates that the SA clothing sector’s trade balance has fluctuated between 1988 and 2000. When considering the breakdown of the clothing and textile trade balances, the trend is, in large part, shaped by the performance of the textile sector as clothing accounts for a comparatively small proportion of total clothing and textile trade. After several hard years, growth in clothing exports is starting to offset foreign inroads into the domestic market. From 1998 to 1999, total apparel exports rose by 33 per cent from R772 million to R1,028 million. In the same period, imports grew from R931 million to R1,043 million. Thus, export growth has begun to make up for import losses.<sup>10</sup>

Currently, the SA apparel industry is standing on the threshold of an historically unique opportunity to rapidly develop its garment industries, primarily because of

<sup>10</sup> Calculations based on the Trade and Industrial Policy Strategies (TIPS) database. See the Web Page, <http://www.tips.org.za>.

three key factors, viz.: (1) the local textile industry is committed to modernization and is investing heavily in technology and in education and training; (2) a supportive policy framework; and (3) recent major trade agreements, i.e., AGOA, EUA, and the SADC Trade Agreement, offer manufacturers new market access opportunities (Coughlin, Rubin, and Darga 2001). Both the industry and government are sanguine that the clothing industry is on the verge of an export-led recovery.<sup>11</sup>

#### B. *E-Business Opportunities for the SA Apparel Sector*

There is enormous scope for extending the use of e-business in the SA apparel sector, particularly in using the internet as a channel for the communication and exchange of structured business information, and for improving the flow of scheduling information along the supply chain to help reduce inventories and improve production planning efficiencies at each stage. In the SA clothing industry there is an acute need for an effective business information system that is able to support: (1) information management (which includes the activities associated with knowledge management, research and development, and marketing); (2) transactions (which encompasses sales and procurement activities); (3) documentation (which encompasses configuration management, maintenance, repair and overhaul activities); and (4) collaboration (which encompasses design, planning activities, etc.) (Lucking-Reiley and Spulber 2001). E-business thus provides the SA apparel sector with the platform to create a flexible, transparent channel responsive to market conditions, and that promotes more efficient purchasing, the creation of efficient pipelines, and better international marketing.

The world of inter-firm commerce in the SA apparel industry has traditionally been paper-intensive, and is usually a highly routinized process with no economies of scale. The actual process of exchanging paper for procurement creates no value, it is simply a method of keeping track of things. The entire process of procurement creates inefficiencies for both the buyer and seller. The ability to move this activity online already existed before the internet (via EDI), but the establishment of one easy-to-use protocol means that it becomes much simpler to move procurement online. The initial efficiencies are obvious and massive, including moving human beings out of the mechanical segments of the information interchange pipeline, thereby increasing reliability and speed. But this is only the initial advantage; when it is completed, every step in the procurement process can be monitored and optimized. In addition, companies can collect data about the data stream, allowing still more opportunities for optimization.

The internet can be used in a myriad of ways to speed and enhance inter-firm relations in the SA apparel sector. The internet reduces physical and bureaucratic drag by drastically reducing the importance of location and the number of proce-

<sup>11</sup> Based on interview data.

dural steps that require the direct intervention of firm operatives. Technological and supply chain practices are redefining the conditions of comparative and competitive advantages in the global apparel industry (Abernathy et al. 1999). Just-in-time delivery, zero defects, and the capacity of producers to respond to quick changes in demand has become highly important, the more so for fashion items where orders are placed once for a season and shelf life is short (Gibbon 2001). In the supply chain, changes in retail management are imposing new conditions on production planning, sourcing strategies, and delivery time (Abernathy et al. 1999). The need to reduce the cost of maintaining large stocks of a wide variety of items, and the use of IT with bar coding and scanning allowing for real-time point-of-sale information on replenishment needs have imposed new terms of competitiveness onto producers and shifted responsibilities to them which require additional investment in IT.

It would appear that global buyers are increasing their expectations of the range of capabilities that potential suppliers should have. Besides the qualities traditionally looked for such as advanced production and logistics capabilities, the latter now normally include well-functioning EDI systems and the capacity to undertake supplier-managed inventory (Ramaswamy and Gereffi 2000). In addition, since new suppliers are typically now taken on only when existing ones are dropped, they are required to "bring something new to the table." As SA apparel firms enter into the international marketplace, particularly the U.S. market, many of their customers will compel them to adopt and use e-business technologies. Rather than waiting for this to happen, SA suppliers should anticipate it and prepare to become e-business enabled. They should see e-business as a way to compete and should offer it proactively to customers.

## V. RETAILERS' EXPERIENCES

The diffusion of e-business in the retail sector appears to be a function of ownership structure, firm size, and market segment (Table II). As far as ownership is concerned, it would seem as if firms listed on the Johannesburg Stock Exchange (JSE) are more likely to have adopted e-business technologies than firms which are a subsidiary of a domestic company, and to a greater extent, private companies. Larger firms (i.e., firms which have more than one thousand employees) reveal a higher uptake of e-business technologies than smaller firms (i.e., firms with less than and equal to one thousand employees). Market segment in the retail link also seems to be an indicator of a firm's adoption of e-business technologies. Retail chains operating in the upper-income and middle-income market segments were more likely to have Enterprise Resource Planning (ERP), EDI, and a website, and to be currently engaged in online trading, than retail chains operating in the lower-income market segment. However, since we are dealing with relatively small numbers caution is advised when reaching conclusions. The results are nonetheless suggestive.

TABLE II  
OWNERSHIP, FARM SIZE, AND MARKET SEGMENT: RETAILERS (N = 17)

	ERP	EDI	Website	Intranet	B2C Online Trading	B2B Online Trading
(%)						
Ownership:						
JSE <sup>a</sup> listed (N = 9)	67	56	89	89	33	56
Subsidiary of a domestic company (N = 3)	33	33	33	33	0	33
Private company Pty. (Ltd.) (N = 5)	0	20	40	0	0	0
Farm size						
(no. of employees):						
≤ 1,000 (N = 9)	22	22	56	22	0	22
> 1,000 (N = 8)	75	63	88	100	63	63
Market segment:						
Upper-income (N = 5)	60	60	80	80	40	60
Middle-income (N = 7)	43	43	71	57	29	43
Low-income (N = 5)	20	20	40	40	0	20

<sup>a</sup> Johannesburg Stock Exchange.

TABLE III  
A PROFILE OF THE RETAILERS (N = 17)

	(%)
Internet access	100
Enterprise Resource Planning (ERP)	47
Electronic data-interchange (EDI)	41
Website	65
Intranet	59
Extranet	0
Business-to-consumer (B2C) online trading	29
Business-to-business (B2B) online trading	35

The vast majority of the retailers were unable to provide accurate annual IT spending data. This data was either considered to be sensitive or alternatively the retailers did not keep accurate records on IT investments.<sup>12</sup> That said, B2B e-commerce does exist in the SA apparel sector in the form of EDI linkages between the major retail chains and the large apparel manufacturers, and accounts for substantial B2B trade revenues. EDI is generally used for core business, i.e., regular bilateral trade between suppliers and customers for large, predictable orders. At present, EDI is used mainly for replenishing cosmetics, toiletries, and core apparel products such

<sup>12</sup> The same applies for the manufacturers (Section VI).

as lingerie. The retailer agrees set stock holdings with the suppliers, and the suppliers procure raw materials and set production space around that.

Currently, 35 per cent of retailers are using the internet or EDI to trade online with their suppliers (Table III). EDI linkages tend to be exclusively with local suppliers. None of the retailers indicated that e-business capabilities on the part of producers are a condition of trade. Retailer 3 (Appendix Table II) has shifted its EDI system from a proprietary, value-added network to an open, internet architecture. Retailer 14 is in the process of making the transition from dedicated value-added networks (VANs) to internet EDI. These two retailers are pushing through e-business initiatives, and in the long term they expect to see improved supplier collaboration delivering improved gross product margins, better in-store availability, and reduced inventory. When large retail chains move their purchasing and sales to the internet, a ripple effect through the value chain is likely to be the outcome. Since the retailers have invested a substantial amount of money in web architecture, they are likely to be determined to get a return on it. Consequently, all of the retailers' trading partners immediately come under pressure to adopt an e-business infrastructure in order to create a sustainable digital trading network. Suppliers, particularly small producers, who resist the internet may be "frozen out" of the supply chain.

EDI, for example, allows Retailer 3 to share data about orders, shipments, inventory, and consumption with its suppliers. On the basis of linking sales-point data to EDI, Retailer 3 has been able to shift to inventory control methods based on lower and later initial orders, selective later replenishments and more frequent introduction of new items. In the past EDI was conducted over proprietary value-added networks, but during the last year Retailer 3 has begun transmitting electronic documents over the internet on the timing and projected volumes of retail sales, and receiving information on capacity at each production stage. Retailer 3 has taken the lead and has managed the process, and claims that its suppliers were enthusiastic about implementing internet EDI since it is cheaper to set up and use than traditional EDI. Moreover, Retailer 3 has reported that internet EDI's greater visibility of stock levels throughout the supply chain helps to minimize inventories and to reduce working capital.

There does not appear to be long-term loyalty between a retailer and its constellation of fashion garment suppliers (i.e., non-core products). The primary reason for this is that fashion trends change constantly, particularly in terms of fabric, style, and color. As a result, retailers often engage in one-time or occasional transactions with suppliers of differentiated fashion garments. Obligational contracting relationships involving trust does not appear to be a defining feature of the buyer-seller relationship in most cases. Most retailers did not have a conscious policy of investing in their producers' capabilities and developing what Sako (1992) calls "obligational relationships."

TABLE IV  
LEVELS OF E-BUSINESS DEVELOPMENT

	Level 1	Level 2	Level 3
Sphere	<ul style="list-style-type: none"> <li>• Functional orientation</li> </ul>	<ul style="list-style-type: none"> <li>• Integrating across functional departments</li> </ul>	<ul style="list-style-type: none"> <li>• Cross-enterprise involvement</li> </ul>
Rationale	<ul style="list-style-type: none"> <li>• Departmental focus</li> <li>• The purchasing and sales department using EDI</li> <li>• Individual departments developing specific internet applications, e.g., a marketing website.</li> </ul>	<ul style="list-style-type: none"> <li>• Integrated business activities via internet/intranet applications</li> </ul>	<ul style="list-style-type: none"> <li>• A virtual ecosystem that connects employees, suppliers, and customers by extending existing EDI</li> <li>• The extranet aims to: build trust and increase customer satisfaction; increase collaboration and knowledge sharing between customers and suppliers; and maximize synergies to lower costs, improve efficiencies and increase quality</li> </ul>
Levers	<ul style="list-style-type: none"> <li>• Technological infrastructure and software applications</li> </ul>	<ul style="list-style-type: none"> <li>• Business processes (process efficiencies within the firm)</li> </ul>	<ul style="list-style-type: none"> <li>• Cultivating knowledge workers</li> <li>• Developing and exploiting intellectual capital to create opportunities</li> <li>• Building relationships</li> </ul>

The fact that the apparel value chain is largely price-driven rather than knowledge- and innovation-driven may account partially for the lack of strong, mutual commitment between buyer and seller. Retailer 14 is an exceptional case. Retailer 14 is presently consolidating its supply base, and deals largely with preferred suppliers with relatively stable contracts. The emphasis here is on forging long-term partnerships with suppliers based on trust, interdependence, and information-intensive links in order to ensure high quality and prompt delivery. Retailer 14 mentioned that changing suppliers for the sake of short-term price advantages is problematic because of the high transaction costs involved as well as the potential risks associated with quality and delivery reliability. Retailer 14 has an active supply chain development program, and is committed to feeding back information to its suppliers in order to assist in upgrading their performance.

Most of the retailers have a web presence (65 per cent) (level 1, Table IV). Forty-seven per cent of the retailers have an ERP system that seeks to integrate business processes and management information across the organization. The intranets that the large companies have installed to connect different departments resemble ERP systems. None of the retailers are presently operating an extranet, although a few indicated that this was a medium-term goal. This suggests that the retailers' prime focus is still on operational efficiency within the enterprise (level 2, Table IV) rather

than trying to increase the organization's effectiveness outside the enterprise by linking across the internet with suppliers to create virtual supply chains (level 3, Table IV).

The innate conservatism of the industry appears to be a stumbling block to adopting e-business systems. The principal obstacle to the accessing of electronic point of sales (EPOS) data is not technological but an issue of mindset. Retailers are generally unwilling to provide their suppliers with a live link into their sales and stock levels because such information is considered to be "confidential." Just 35 per cent of retailers allow their suppliers access to information about how each of their apparel products is selling in their stores. Suppliers use authentication procedures involving user IDs and passwords to access the system, and they then use their own order numbers to trace their products so as to get an idea of stock balances. The vast majority of retailers do not provide their suppliers (even for replenishment stocks) with electronic access to their point of sales information. Core product suppliers are informed of replenishment orders through word of mouth (i.e., over the telephone or through the agents) or by fax.

Most of the retailers mentioned that a major barrier to trading directly and exclusively over the internet is the personalized, tactile nature of the buying and selling process in the fashion industry. However, there is one retailer operating at the lower-end of the market who reported using the internet for procuring commodity apparel products. The idea of buying apparel through B2B trading hubs and auction sites was, however, generally not an option for the vast majority of the retailers. The primary reason for this is that many of the trading hubs are still in the formative stage of development. The retailers mentioned that B2B clothing trade exchanges will need to offer, or at least make available, packages of complementary services such as payment/settlement mechanisms, insurance, logistic systems, inspection, certification of quality, and customs clearance.

Finally, 29 per cent of retailers are currently selling apparel products directly to consumers via the internet. B2C retail sales have been very disappointing, and retailers are beginning to question the commercial viability of a B2C operation in the short to medium term.

## VI. MANUFACTURERS' EXPERIENCES

The e-business results of the manufacturers were not affected by ownership or channel of sales (marketing segment). Firm size and export orientation, however, seem to have affected the diffusion of e-business technologies among the manufacturers (Table V). The larger producers are more likely to have ERP, EDI, a website and an intranet than the smaller producers. In addition, the larger manufacturers are more likely to be engaged in online B2B trading than the smaller garment makers. Manufacturers who are currently exporting would seem to have a better uptake of e-

TABLE V  
FIRM SIZE AND EXPORTING: MANUFACTURERS (N = 21)

	ERP	EDI	Website	Intranet	B2B Online Trading	B2C Online Trading
(%)						
Firm size (no. of employees):						
≤ 100 (N = 4)	0.0	0.0	25.0	0.0	25.0	25.0
101–500 (N = 7)	28.6	42.9	42.9	0.0	42.9	14.3
501–800 (N = 5)	40.0	100.0	40.0	20.0	80.0	0.0
> 800 (N = 5)	80.0	80.0	80.0	40.0	60.0	0.0
.....						
Exporting:						
Yes (N = 15)	40.0	60.0	53.3	20.0	60.0	13.3
No (N = 6)	40.0	50.0	33.3	0.0	33.3	0.0

TABLE VI  
A PROFILE OF THE MANUFACTURERS (N = 21)

	(%)
Internet access	100
Enterprise Resource Planning (ERP)	38
Electronic data-interchange (EDI)	57
Website	48
Intranet	14
Extranet	0
B2C online trading	10
B2B online trading	52

business technologies than the non-exporters. Again, caution is advised as we are dealing with small numbers.

Forty-eight per cent of manufacturers have a website, and 52 per cent of firms are using the internet or EDI to trade online with their customers (Table VI). There are six main reasons why manufacturers are reluctant to introduce an e-business system in their firms: (1) the lack of a critical mass of e-business enabled apparel firms, thus impeding sector-wide activity; (2) the initial costs in terms of financial, human resource, and time investment associated with developing an e-business system; (3) low levels of IT skills and capabilities; (4) lack of knowledge about the internet and its potential business opportunities; (5) a substantial number of manufacturers are very reluctant to allow their suppliers and customers access to their databases and inner workings. This is indicative of a lack of trust in the apparel value chain, and perhaps an unwillingness to expose a firm's weaknesses and mistakes. It has to do mainly with evolutionary path dependencies which have locked firms into an insular, inwardly oriented way of thinking; and (6) some manufacturers are concerned

that the goal of e-business is simply to squeeze them on price, and that e-business will weaken/threaten their long-standing relationships with existing buyers. We, however, would argue that building relationships will be even more important in an e-business world, where multiple channels and interaction points create a level of complexity not experienced previously (see Aldrich 1999).

For manufacturers, an online B2C transition is perceived as a very risky shift in strategy. Hence the low percentage of manufacturers who are engaged in B2C trade (Table VI). This has to do mainly with perceived channel conflict and fear of alienating their customers (i.e., the retailers), as they will now be directly competing with their customers. A substantial percentage of the manufacturers export (71 per cent). The manufacturers claimed that they make use of agents to connect to exporting markets, rather than through digital links. Digital connections it is argued is important for contacting the agents, but not for direct communication to the overseas suppliers. We found no evidence of disintermediation in the production pipeline. The majority of the manufacturers were emphatic that they would not purchase or sell through online auction and exchange sites because of the high risks involved: bid-price manipulation, false product descriptions, and failure to deliver merchandise. In addition, the manufacturers claimed that information about product certification, product quality, or trading partner reputation generally is not readily or directly accessible at the hubs. Furthermore, there is the view among the respondents that garments may not be as tradable through B2B e-marketplaces as other, more standardized commodities such as automotive parts, computer software, and laboratory products.

Competitive pressures arising from globalization and trade liberalization have forced the larger apparel manufacturers to downsize and outsource to cut-make-trim factories (CMTs), which are made up primarily of small and micro enterprises. Most manufacturers stated that the low IT capabilities of the CMTs could be seen as an obstacle to e-business taking root in the industry. Moreover, some of the manufacturers have developed a network of offshore assembly arrangements with low-wage countries. The introduction of global buying network arrangements can be understood as a strategy to ensure international competitiveness, and as a defense against cheap imports. The spread of outsourcing in the apparel industry means that firms manage many more alliances, and underscores the importance of an integrated, robust business information system.

The manufacturers indicated that their primary business concerns are the threat of competition (81 per cent), the need to control costs (100 per cent), and the difficulty of finding new trade opportunities in mature markets (81 per cent). Thus it would seem that clothing manufacturers have much to gain from adopting and using internet-based e-business applications. Apparel manufacturers are being forced to adjust their production arrangements in order to improve quality, maintain lower price, produce smaller batches of more varied products and respond rapidly to chang-

ing customer demand. The drive for competitiveness is leading to changes in inter-firm arrangements. The manufacturers mentioned that non-price factors such as quality, delivery reliability, quick response, and flexibility are becoming critical competitive differentiators. Apparel manufacturers are under pressure to improve their efficiency levels to ensure long-term sustainability. Supply chain inefficiencies such as high inventory levels and long lead times were emphasized as key problem areas.

Several of the manufacturers have fairly advanced business information systems (e.g., Manufacturers 13 and 14, Appendix Table I). Manufacturer 14, for example, uses “vendor-managed inventory” (VMI), which is a sophisticated system for managing stock and replenishing shipments. Manufacturer 14 has installed a web-enabled information system in order to handle efficiently the large amounts of data VMI processes generate. Major customers do not send orders to Manufacturer 14, but rather shares with Manufacturer 14 their projected sales or consumption forecast and reports of actual sales or consumption via internet-based EDI. Manufacturer 14 uses this data to calculate how much stock the customer has and how much it will need to hold to cover the projected consumption or sales between the current and the next shipment. Manufacturer 14 then sends replenishment based on this calculation. Early estimates indicate that internet-based VMI has contributed to inventory reductions of 40–45 per cent.

Manufacturer 13, on the other hand, implemented “quick response” (QR) technologies (i.e., EDI, VMI, and bar coding of products and shipping cartons) in 2000. As a result of QR, Manufacturer 13 has claimed that its order-cycle time has been reduced and its supply chain has become more efficient. Bar-code scanning of products at retail has enabled Manufacturer 13 to know the exact sales of each item in real time and, thus, to be able to calculate the quantities that must be shipped to meet the forecasted required stock levels. Bar coding of shipping cartons has enabled the use of automated shipping systems that reduce handling and transit time and make it possible to ship efficiently small quantities of many items.

Many of the manufacturers, however, still have not integrated their internal systems; others (38 per cent) that have invested in ERP systems have a firmer foundation. Some manufacturers claimed that they have not given external parties access to their systems because their systems are not integrated; it is still very much modular based. This is problematic considering that the aim of B2B e-commerce is not to just connect customers to a manufacturer’s website but to connect them to the manufacturer’s business, i.e., to both back- and front-office systems. The manufacturers’ ERP (38 per cent) systems and the intranet (14 per cent) are primarily being used to generate internal efficiencies and to obtain integrated management information within the firm (level 2, Table IV). They are not geared, for instance, to receiving customer demand forecasts generated direct from retailers’ EPOS terminals through the supply chain.

## VII. IMPLICATIONS FOR POLICY

### A. *Government's ICT Policy: The Status Quo*

Table VII provides a snapshot of the South African government's ICT policy vis-à-vis industrial development. Government has identified e-commerce, the creation of an ICT-based knowledge economy and an export-oriented growth trajectory as being critical elements for SA manufacturing competitiveness (DoC 2000; DTI 2001a; Kaplan 2000). The missing link, however, is IT policies specifically designed for the clothing sector.<sup>13</sup> Currently, the Department of Trade and Industry (DTI) has no incentive schemes that explicitly promote the uptake of IT among apparel firms (DTI 2001b).

The ICT policy of the South African government is captured and reflected in four initiatives: (1) the Department of Telecommunications' (DoT 1996) proposal to liberalize the SA telecom market; (2) the South African Information Technology Industry Strategy (SAITIS) (2000), a broad consultative group that produced an integrated framework for the ICT sector; (3) the Department of Communications' (DoC 2000) efforts to develop policy to facilitate the growth of e-commerce, with the publication of an e-commerce green paper (DoC 2000) in November 2000; and (4) the recent discussion document released by the DTI (2001a), which makes the case for ICT-based, knowledge-intensive industrial development.

Widespread and affordable telecommunications services are a lynchpin for successful e-business. An uncompetitive, regulated telecommunications environment, such as South Africa's, could constrain the development of value-added services for business (Giovannetti 2001). The parastatal Telkom currently has a five-year monopoly over fixed-line telecommunications services, which expires in May 2002, after which it may apply for a sixth year (DoT 1996). The SA telecom industry is currently in a state of flux as government develops new policies for the post-exclusivity period. It is important that the Independent Communications Authority of South Africa (ICASA) move quickly to open up the telecom sector.

Telkom's restricted supply of broadband capacity is a shortcoming in linking SA companies with the rest of the world. Opening up bandwidth through investment in Digital Subscriber Line (DSL) technology and optical fiber cable is, therefore, a priority. But as long as Telkom has a monopoly, broadband access is likely to be delayed. There is evidence, however, that the industry is moving slowly but inexorably towards a more competitive environment. Government announced in March 2001 that it would partially liberalize the local telecom market by introducing a

<sup>13</sup> The SA Clothing Federation (CLOFED) also does not have a formal IT policy for its members. CLOFED is only just beginning to discuss the potential for e-business and the internet to reduce transaction costs and to increase the scope for inter-organizational and international trading.

TABLE VII  
GOVERNMENT'S ICT POLICY

ICT Policy	Department	Explanation	Remarks
Telecommunications Policy (1996)	Department of Telecommunications	Policy designed to liberalize and privatize the telecoms market. The objective being to promote technical efficiency, network growth, increase in broadband connectivity, declining internet, and call charges.	No specific policy directed towards the apparel industry.
The South African Information Technology Industry Strategy (SAITIS) (2000)	Department of Trade and Industry	SAITIS, a broad consultative group, is concerned primarily with building the local ICT sector's capacity.	No specific policy directed towards the apparel industry.
E-commerce green paper (2000)	Department of Communications	Deals primarily with legal and contractual aspects of e-commerce, including trade laws, taxation, intellectual property rights, consumers' protection and security.	No specific policy directed towards the apparel industry.
Driving Competitiveness: An Integrated Industrial Strategy for Sustainable Employment and Growth (2001)	Department of Trade and Industry	Makes the case for a knowledge- and innovation-intensive, and export-oriented development strategy. Underpinning the market-driven, industry-centered strategy is the adoption and use of ICTs.	No specific policy directed towards the apparel industry.

single new competitor in May 2002, which will compete with Telkom on all services. A further competitor will be licensed to operate within five years. In addition, government has indicated that Telkom will be listed on the JSE Securities Exchange and possibly the New York Stock Exchange. Cellular telephony is also challenging Telkom's monopolization of telecommunications in South Africa, especially with the government's recent granting of a third cellular license. The Department of Communications seems to be adopting a "managed liberalization" approach to gradually open up the telecom market.

SAITIS (2000) is concerned primarily with building the local ICT sector's capacity. This is important considering that packaged software applications for busi-

ness are largely imported, though with most custom development and package adaptation performed locally. SAITIS, however, pays little attention to the potential impact of ICTs on other industry sectors, such as apparel, and thus minimizes opportunities for implementing e-business in ways that can maximize economic competitiveness. Moreover, SAITIS has not taken the lead in stimulating ICT adoption through partnerships with industry. This is especially problematic since lead firms in the apparel sector have generally not taken a leadership role in rolling out e-business initiatives.

Despite having a very broad definition of e-commerce, the Department of Communications' (2000) policy paper deals primarily with legal and contractual aspects of e-commerce, including trade laws, taxation, intellectual property rights, consumers' protection and security. It does not specifically deal with the application of the internet to the business processes embodied in industrial value chains. Policies that specifically address e-business issues from a value chain perspective, and which are tailored to the SA apparel sector, are urgently required.

While the DTI (2001a) new industrial development strategy engages with the challenges posed by the information economy, this is done at an abstract, theoretical level. Moreover, in the author's opinion, it does not go far enough to articulate specific strategies for e-business development, particularly sectoral policies. The DTI will need to design and implement detailed strategies to upgrade the IT infrastructure of SA firms in specific sectors which are lagging in e-business development. Policy will need to focus on the constraints and tensions that apparel firms are likely to face in making the transition to e-business. A critical policy challenge rests in changing the business culture and practices of SA apparel firms to make them consistent with international best practice.

#### B. *What Is to Be Done?*

The SA apparel sector can only maintain a competitive edge if it integrates ICTs and innovation into the production process. Currently, DTI support schemes place too much emphasis on the generation of technology rather than its effective use. In-depth technical and system-specific skills to support e-business are a pressing priority in the apparel sector. The development of human resources and technical capacities in the apparel sector requires a combination of education and training initiatives. A weakness of the DTI's new industrial strategy is that it provides incentives for those who already have relatively high knowledge-based skill levels and IT capabilities, thus leaving the poor and the illiterate out of the loop.

Government could, for example, adopt e-business-type solutions for trade-related services such as port and customs clearance in order to improve trade facilitation. By enabling paperless trading, government will play a major role in assisting exporters in becoming e-business ready. Enterprise- and industry-level incentives for applying e-business strategies could include special tax, training, and invest-

ment incentives for IT savvy firms, establishing of “techno-parks” (similar to an export-processing zone) and provision of special access to finance for e-business initiatives.

Government accounts for about 60 per cent of IT spending in South Africa. The State Information Technology Agency (SITA) and the state-owned Arivia.com, which was formed as a result of the merger of Eskom ITS, Datavia and Ariel Technologies, are responsible for management and execution of IT services and related work for government. They complement each other in helping government harness the power of digital technologies to meet its social and economic objectives. These two agencies could play an important role in assisting e-business deployment in the apparel sector. Many of the processes used in government have parallels in the business world, and offer similar opportunities to increase efficiency gains. Electronic procurement is an example.

The Technology and Human Resources for Industry program (THRIP) should become actively involved in fast-tracking the implementation of e-business in the apparel sector.<sup>14</sup> THRIP is managed by the National Research Foundation (NRF), while funding is provided by DTI and industry. Industry and government invested more than R202 million jointly during 1999 to develop people and skills through THRIP. THRIP aims to improve the competitiveness of SA industry by supporting scientific research, technology development, and technology diffusion activities and enhancing the quality and quantity of appropriately skilled people. The program is also designed to foster collaboration among industry, higher-education institutions and the government science, engineering and technology institutions as a means of contributing to the removal of past inhibitors to joint activity among these three actors.

Since e-business technology can be expensive, the issuance of IT grants is important. The Technology Transfer Guarantee Fund (TTGF) was launched by the DTI on June 4, 2001 to promote access to local and international technology. It will be administered and managed by Khula Enterprise Finance on behalf of the DTI.<sup>15</sup> TTGF is specifically targeted to assist small, medium, and micro enterprises (SMMEs). The maximum guarantee an applicant will be able to obtain is R1 million. Currently, TTGF’s focus is on manufacturing technology. This will need to be expanded to include ICTs.

This paper has argued that the SA apparel industry is currently at a critical stage in its development, and will need to harness the efficiency gains promised by e-business if it is to be internationally competitive. Table VIII lists the key productivity gains that are most frequently mentioned in the e-business literature.<sup>16</sup> The first three gains are essential requirements for competitive success of the SA apparel

<sup>14</sup> See the Web Page, <http://www.nrf.ac.za/thrip>.

<sup>15</sup> See the Web Page, <http://wwwdti.pwv.gov.za>.

<sup>16</sup> See, for example, Cronin (1996), Lee and Clark (1997), Montealegre (1999), and Press (1996).

TABLE VIII  
POLICY FOCUS

Potential Efficiency Gains from B2B E-Commerce	Policy Priority
A seamless communication and information exchange channel	High
Supply chain management and logistics	High
Cost efficiencies from automation of transactions	High
Consolidation of demand and supply through organized B2B trade exchanges	Medium

industry, and are therefore accorded a high policy priority. The prime concern for government (and CLOFED) is to promote the adoption and use of e-business as a powerful instrument for advanced supply chain management through: reducing overall inventory levels, transportation costs, and order and delivery lead times; exchanging information and facilitating communication and collaboration between economic agents; and increasing the speed and efficiency of economic transactions. The primary objective being the use of ICTs to network economic activities and processes between firms in order to reduce information asymmetries and trade-related transaction costs.

The efficiency improvements and cost savings likely to ensue from B2B trading exchanges is not as clear-cut as the other benefits listed in Table VIII, at least not in the short term. Centralized B2B e-marketplaces suffered from a certain naïveté about business fundamentals. It was assumed that simply automating transactions would be enough to bring buyers and sellers together online. The fact that deciding which supplier to buy from is often based on other factors, such as the quality of the product, how quickly and reliably that product can be delivered, and even contractual obligations was effectively ignored. Further, if the goods are not highly commoditized, it becomes very difficult for the public marketplaces to provide value.

Further, the kinds of transaction-related support services currently available at online trading platforms are more limited in their scope and functionality than is often assumed in the literature on e-marketplaces (Raisch 2001; Sculley and Woods 2001). The general lack of, or inadequate provision of, transaction facilitation services (such as the screening of potential trading partners, the provision of secure payment systems, certification of parties with regard to aspects such as quality and environmental standards, verification of the accuracy and relevance of the information provided by trading parties, and the inspection of products offered for sale) is a major shortcoming. The direct or indirect provision of these services is particularly important for B2B e-commerce across national boundaries because information asymmetries (about both firms and their products) are likely to be higher, and other means of redress less effective and more expensive (Maitland 2001).

In Table VIII, B2B trading hubs are listed as a medium-term policy concern primarily because the real impact of B2B trading exchanges for apparel firms has

yet to be fully articulated and demonstrated. It may well be that in the near future e-marketplaces may become an important channel for global apparel trade. This is most likely to happen if information provision is complemented by services that give buyers and sellers a low-cost means of acquiring confidence that transactions will be completed successfully. Policymakers will, therefore, need to closely monitor and assess developments in the world of e-marketplaces.

## VIII. CONCLUSION

Despite strong theoretical arguments suggesting that e-business has much to offer the SA apparel industry (in terms of connecting to markets, productivity gains, potential cost savings, and systemic efficiencies), the empirical evidence would seem to suggest that e-business in the garments industry is in its infancy. The SA apparel industry is at a critical stage in its development after several very hard years. We argue that the clothing sector can still be an important engine of growth, job creation, and foreign exchange earnings for South Africa, however, the successful development of the sector will depend on how well policymakers and industrialists understand the forces shaping the market and are prepared to move fast to create the necessary conditions for a coordinated fast track lift-off.

The new global operating environment is pressuring SA apparel firms for greater flexibility, reduced costs, speed, and innovation. It has therefore become necessary for apparel companies to develop and apply more advanced web-based technologies to automate transactions and also allow the exchange of data and information between firms in real time. E-business thus becomes a powerful mechanism to drive down costs, improve performance, be more flexible, and overcome time and space constraints. The SA apparel industry does not need to reinvent the wheel. The best strategy is to learn from the e-business experience of the United States and Europe. The challenge for SA apparel firms is to: (1) gain a critical understanding of e-business; (2) design an appropriate IT architecture which takes into account external demands as well as resource-based, internal sources of competitive advantage; (3) align business plans and resources with IT; and (4) develop the capability to exploit ICTs.

The current phase of e-business can be considered an experimental one, with firms concentrating on limited, relatively low-risk applications of the internet that do not pose too hard questions in areas such as security. As the demand for e-business grows, and firms feel more secure in their handling of IT, e-business will enter a second phase in which portals integrating a wider range of online transactions in a secure environment will be more widespread. For most apparel firms the issue today is how to identify the areas where their first forays into e-business can be more productive. The experiences so far point to procurement, websites for the processing of relatively simple transactions and extranets that allow firms to share

and exploit data more efficiently as the types of internet applications in which early success is more likely.

Investments in e-business need to be made on the basis of an understanding of the firm's needs, its resources, and its environment. A modular, phased migration path to e-business capability is probably the most prudent strategy for SA apparel firms to adopt. Firms should embark on modular experimentation, i.e., building systems as small initiatives in order to get the best return on investment. As success with the modular prototype grows, apparel firms can start building more "modules." For example, clothing firms may target global audiences through a simple website for marketing purposes, and email for communication, with online ordering and online payment capabilities added on at a later stage. According to Downes and Mui (1998, p. 201), "In the uncertain business environment of the digital frontier, real world evaluation of digital strategy prototypes is often the only means of testing and ensuring business value." A survey carried out by Dewan and Kraemer (1998) reveals that together with investment in IT, there is a need to ensure that organizations have the capacity to restructure themselves to promote efficiency and effectiveness. SA apparel firms need to rethink their current organizational and technological infrastructures. A dynamic, integrative e-business strategy needs to be considered.

The international apparel industry is increasingly becoming ICT-based and information-driven. Increasingly leading-edge apparel buyers and manufacturers are using ICTs to transform the way they do business and in which they collaborate with trading partners. In particular many of them are using the internet and other quick response technologies to network economic activities with their customers and suppliers (Abernathy et al. 1999; Gibbon 2001). The success of the SA apparel industry will depend to a large extent on how well the sector harnesses the potential of e-business to improve performance, cut costs, increase efficiency, and reduce time and distance constraints. Hence, e-business is not a utopian vision for the South African apparel sector, but rather a pragmatic reality and a necessary (but not sufficient) condition for international competitiveness.

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APPENDIX TABLE I  
A GENERAL PROFILE OF THE APPAREL MANUFACTURERS (N = 21)

	Ownership	No. of Employees	Market Segments <sup>a</sup>	Product Lines	Exports	Outsource to CMTs
Manufacturer 1	Private company	500	N/A <sup>b</sup>	Workwear & uniforms	No	Yes
Manufacturer 2	Private company	400	AB & BC	Ladies' & men's outerwear	No	—
Manufacturer 3	Subsidiary of a domestic company	1,000	AB & BC	Men's formal & casual outerwear	Yes (45% of total sales) [US & UK]	No
Manufacturer 4	Subsidiary of a domestic company	800	AB & BC	Men's tailored clothing	Yes (40–50% of total sales) [UK & US]	—
Manufacturer 5	Private company	300	BC	Ladies' outerwear	No	Yes
Manufacturer 6	Subsidiary of a domestic company	60	AB	Children's wear	Yes (95% of total sales) [UK & US] <sup>c</sup>	No
Manufacturer 7	Subsidiary of a domestic company	1,000	BC	Lingerie & ladies' sleepwear	Yes (40% of total sales) [EU]	—
Manufacturer 8	Subsidiary of a domestic company	600	BC	Children's wear	Yes (30% of total sales) [EU]	—
Manufacturer 9	JSE <sup>d</sup> listed	1,700	AB	Tailored garments (men & women)	Yes [UK]	No
Manufacturer 10	Private company	400	BC	Ladies' outerwear	Yes [EU & US]	—
Manufacturer 11	Private company	600	BC	Ladies' outerwear	Yes [EU & US]	Yes
Manufacturer 12	Private company	450	BC	Ladies' outerwear	Yes [UK & US]	—
Manufacturer 13	Subsidiary of a domestic company	4,000	AB & BC	Formal ladies' & men's outerwear	Yes [EU]	—
Manufacturer 14	Subsidiary of a domestic company	500	AB	Ladies' & men's outerwear	Yes [Australia, UK & US]	Yes
Manufacturer 15	Subsidiary of a foreign company	1,500	AB & BC	Men's & women's undergarments	No	—
Manufacturer 16	Subsidiary of a domestic company	65	AB	Children's wear	Yes (25% of total sales) [US]	Yes

APPENDIX TABLE I (Continued)

	Ownership	No. of Employees	Market Segments <sup>a</sup>	Product Lines	Exports	Outsource to CMTs
Manufac- turer 17	Private company	300	AB	Sportswear (men & women)	No	—
Manufac- turer 18	Subsidiary of a domestic company	100	AB	Ladies' outerwear	Yes [UK]	Yes
Manufac- turer 19	Subsidiary of a domestic company	700	AB	Men's outerwear	Yes (30% of total sales) [US, UK & Germany]	—
Manufac- turer 20	Subsidiary of a domestic company	100	AB	Ladies' outerwear	Yes [UK]	—
Manufac- turer 21	Subsidiary of a domestic company	600	BC	Men's outerwear	No	No

<sup>a</sup> The author used the following three income categories to segment the SA apparel consumer market: AB (high-income), BC (middle-income), and CD (low-income).

<sup>b</sup> N/A means "not applicable."

<sup>c</sup> Secondary export markets: Spain, Italy, France, Japan, and the Middle East.

<sup>d</sup> Johannesburg Stock Exchange.

APPENDIX TABLE II  
A GENERAL PROFILE OF THE APPAREL RETAILERS (N = 17)

	Ownership	No. of Employees	Market Segments <sup>a</sup>	Exports <sup>b</sup>	Supplier Base (% Local)	Supply Chain Development Programs
Retailer 1	Private company Pty. (Ltd.)	180	AB	No	50 (local)	No
Retailer 2	Private company Pty. (Ltd.)	160	AB	No	45 (local)	No
Retailer 3	JSE <sup>c</sup> listed	3,000+	BC	No	70 (local)	No
Retailer 4	JSE listed	2,000+	BC	No	70 (local)	No
Retailer 5	JSE listed	1,500+	BC	No	60 (local)	No
Retailer 6	JSE listed	5,000	BC	No	60 (local)	No
Retailer 7	JSE listed	5,000	CD	No	60 (local)	No
Retailer 8	JSE listed	2,000	CD	No	50 (local)	No
Retailer 9	Subsidiary of a domestic company	500	CD	No	—	No
Retailer 10	Subsidiary of a domestic company	400	AB	No	—	No
Retailer 11	JSE listed	900	BC	Yes	—	No
Retailer 12	Private company Pty. (Ltd.)	300	AB	No	—	No
Retailer 13	Private company Pty. (Ltd.)	300	CD	No	40 (local)	No
Retailer 14	JSE listed	5,000	BC	Yes	90 (local)	Yes
Retailer 15	JSE listed	7,000	BC	Yes	90 (local)	Yes
Retailer 16	Private company Pty. (Ltd.)	350	CD	No	50 (local)	No
Retailer 17	Subsidiary of a domestic company	841	AB	No	70 (local)	No

<sup>a</sup> The author used the following three income categories to segment the SA apparel consumer market: AB (high-income), BC (middle-income), and CD (low-income).

<sup>b</sup> Exports are occurring through the retail chain supplying locally sourced merchandise to franchise stores located outside the country.

<sup>c</sup> Johannesburg Stock Exchange (JSE).

APPENDIX TABLE III

THE SOUTH AFRICAN APPAREL INDUSTRY: A MACRO PERSPECTIVE (1998 FIGURES)

- 8,000 retailers, employing 50,000 people.
- Domestic apparel retail sales—R25,000 million.
- Approximately 1,600 manufacturers (formal sector), employing 133,000 people. If the informal sector is included, this figure could rise to 200,000 people. Total production—R9,650 million (value of actual sales).
- Apparel imports (f.o.b.)—R931 million; Apparel exports (f.o.b.)—R772 million.
- South Africa sourced 62.78 per cent of its total apparel imports from just three countries, i.e., Malawi, China, and India, respectively. The United States (42.3 per cent) and the United Kingdom (32 per cent) are South Africa's two main export markets.
- Five retail groups account for 50 per cent of turnover.
- Over the past four years, the industry has shed 20 per cent of its labor.

Source: CLOFED (2000, pp. 62, 63, 65, 81).