A FREE TRADE AREA BETWEEN SOUTH AFRICA AND INDIA: WHICH COMMODITIES MATTER?

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EXECUTIVE SUMMARY

The aim of this report is to provide policy-makers at the Department of Trade and Industry (DTI) with a first round of identification of those commodities that feature prominently in the trade flows between South Africa and India. These commodities will be of special interest to trade negotiators regarding a potential free trade area (FTA) with India. We start with a descriptive analysis of imports, exports and total trade (the sum of imports and exports) between South Africa and India. The descriptive analysis is based on annual trade flow data from Customs and Excise at current prices and covers the period from 1991 to 2000. This is followed by a short comment on the trade intensities based on UNComTrade data and tariff structures on trade between the two countries.

We then turn our attention to estimating the impact of the proposed FTA between South Africa and India on the economies of the two countries. Simulations are conducted with a static, partial equilibrium methodology, based on the trade creation and trade diversion principles. Following a hypothetical free trade arrangement between South Africa and India, the following changes in trade flows between the two countries and third countries can, amongst others, be distinguished:

❑ Trade creation, which measures the increase in South African imports from India due to a decrease in the relative price of these imports vis-à-vis domestically produced goods, resulting in a net increase in South Africa's total imports and a net decrease in South Africa's domestic production; and
❑ Trade diversion, which measures the increase in South African imports from India due to a decrease in the relative price of these imports vis-à-vis imports from other countries, resulting in a different geographical composition of imports, whereby imports from India increase at the expense of imports from other sources, with no change in total South African imports.

Trade creation is considered to be welfare enhancing since relatively high-cost domestic production is replaced with lower-cost imports from India. Nevertheless, South Africa has to face the decline of local, albeit less efficient, production. Trade diversion is considered to be welfare lowering in that South Africa switches its source of imports from a more efficiently producing country to a less efficiently producing country, leading to a less efficient allocation of resources, although the total import bill remains unchanged. The methodology employed here is relatively simple, with low data requirements, and can be used to evaluate the impact of changing tariff levels on trade patterns at a disaggregated commodity level.

Finally, we consider the concept of revealed trade barriers (RTB). With regard to Indian imports, the question is: To what degree is the share of imports of a particular South African product in the total import basket of India larger or smaller than the share of total imports of that product in India's total imports (summed over all products)? In other words: Is the import of a particular South African commodity more or less important compared to total Indian imports of that commodity from all sources? If the latter is the case, we may conclude that South Africa is exporting a commodity relatively more to the rest of the world than it is to India, possibly due to trade barriers in India.

In terms of trade flows, South Africa has developed a trade surplus with India, importing to the value of about R1.8 billion and exporting about R3 billion in 2000. South African imports

from India are concentrated in textiles and clothing, raw hides and leather, and vegetable products, while exports to India are more diversified with contributions made by mineral products, chemicals, base metals, textiles, and pulp and paper. The tariff structure on imports from India shows an estimated unweighted average tariff of about 12%. Particularly high rates are imposed on textiles and clothing, footwear and raw hides, skins and leather products with 27%, 24% and 16% unweighted average rates respectively. All other groups of commodities, at least at the 22-chapter level, are treated with an average rate of around 10% or less.

On the other side of the bilateral trade flows, South African exports to India are faced with an unweighted average tariff of 24%. Of particular concern to South African trade negotiators are broad commodities such as motor vehicles and machinery, which are challenged with duties of 40% on average. About 25% of South African exports to India are in precious stones and metals, mainly for jewellery. Although these exports are also faced with relatively high tariffs, their import price elasticity is probably very low.

Of considerable interest to policy-makers is the potential for intra-industry trade. Identification of commodities with high intra-industry trade indices in trade with India – relative to trade with the rest of the world – would greatly facilitate negotiations as both parties are expected to benefit from free trade on such commodities. It should be noted that the intra-industry trade indices only become relevant at a relatively high level of disaggregation and we can only present results with regard to South Africa's trade. The results of this component of the analysis suggest considerable intra-industry trade for basic fabricated metals, precious stones and metals for jewellery, and some non-metallic minerals commodity groups.

Turning to our partial equilibrium impact model, the results of the trade creation/diversion analysis suggest that in trade negotiations between South Africa and India, the former will focus on the textiles, clothing, leather, and electrical machinery commodities. It is in these product groups that imports from India are expected to make some inroads in terms of replacing domestic production. Also, with zero tariffs on Indian imports, these commodities will be subject to considerable trade diversion. In other words, imports of these commodities that are currently sourced from other countries will be replaced by imports from India. Commodities such as food products, metals products and heavy machinery require less attention as far as trade creation and trade diversion in South Africa is concerned.

From India's point of view, a potential FTA with South Africa could raise concerns of trade creation and trade diversion for precious metals for jewellery, coal, iron and steel, basic chemicals, machinery and some non-metallic minerals products.

The RTB analysis shows that Indian exports of textiles and clothing, as well as footwear and wood products, are overtraded in the South African market, i.e., South African imports of these groups of commodities are sourced relatively more from India than other countries. This suggests that there is no RTB for these commodity groups. On the other hand, a large range of Indian commodities with small trade volumes is relatively undertraded in South Africa, which suggests, in terms of the revealed trade barrier yardstick, a broad approach by Indian trade negotiators. The same applies to South African exports to India. Commodities with large trade volumes are overrepresented in the Indian market, compared to the average basket of Indian imports, including coal, iron and steel, pulp and paper and motor vehicles. Interestingly, this occurs in spite of relatively high trade barriers.

1 INTRODUCTION

Many developing countries have been unwilling participants in multilateral trade liberalisation agreements. South Africa is not one of these. South Africa successfully participated in the Uruguay Round of the then General Agreement on Tariffs and Trade (GATT), has concluded a development and co-operation agreement (including a free trade agreement) with the European Union (EU), and recently sealed a free trade agreement with the Southern African Development Community (SADC). South Africa's interest with free trade matters is based on a realistic assessment of the growth potential of its domestic market. In recent years, it has shown some potential for strong growth but has generally fallen short of the levels of growth required to substantially reduce chronically high unemployment levels. The South African government is thus employing a strategy of limited domestic consumption stimulation, through, for example, the reduction of middle-class tax levels, and a sharply focused export-oriented growth strategy.

Thus, the agreements with the EU and SADC encourage South African manufacturers to specialise in those industries in which they have a degree of competitiveness and encourage investment in South Africa by companies wishing to produce goods for export to the EU and SADC. Moreover, the agreements provide South Africa with a degree of power to leverage trade concessions from third countries fearful of the diversion of their trade with South Africa to the EU or SADC partners and *vice versa*.

It is within this context that the issue of a FTA with India arises. India has in recent years come to play an increasingly important role in multilateral fora such as the WTO and as a relatively large and strongly growing economy, is an important developing country ally for South Africa.

The aim of this report is to provide policy-makers at the DTI with a first round of identification of those commodities that feature prominently in the trade flows between South Africa and India. These commodities will be of special interest to trade negotiators regarding a potential free trade area with India. We use a relatively simple partial equilibrium analytical framework, although we lack South Africa specific data for some variables and use SACU trade data as a proxy for South African trade data, ignoring the potential future existence of FTAs between South Africa and other partners.

We start with a descriptive analysis of trade flows and tariffs between South Africa and India, which includes a view on the total market for merchandise imports in India and a measure of changes in trade patterns between the two countries. We continue with an analysis of potential trade creation and trade diversion, which is based on a methodology derived from UNCTAD and previously applied to examine South Africa – EU trade creation and diversion (Jachia and Teljeur 1998). Since trade creation effects are not relevant to products that are currently not traded, we also present results of a special application of the theory of revealed comparative advantage for the identification of *de facto* barriers to trade between the two countries. According to Jachia and Teljeur, this information may prove useful during the negotiations for any free trade agreement, as the main "offensive interest", i.e. important tariff lines that the negotiators should target as valuable inclusion in the tariff phase-down schedule, need to be identified. We conclude with a summary.

2 CURRENT STRUCTURE OF TRADE BETWEEN SOUTH AFRICA AND INDIA

We start with an aggregate view on imports, exports and total trade (the sum of imports and exports) between South Africa and India, followed by an analysis at increasingly more disaggregated commodity levels. The analysis is based on annual data from Customs and Excise at current prices and covers the period from 1991 to 2000. We continue with a short comment on the tariff structure on trade between South Africa and India and conclude this section by focusing on trade intensities between the two countries.

2.1 Aggregate trade flows

Table 1, row 1 shows that South African imports from India for the period 1991–2000 increased from R82 million to R1.8 billion in current prices. This constitutes a weighted average annual increase of 46% in nominal terms. Total imports (from all sources) by South Africa increased by 17% over the same period as shown in row 4, the share of India imports in Total South African imports therefore increased significantly, from 0.2% in 1989 to 1% in 1998. In the last two years of the period of observation, it can be seen that imports dropped in 1999, presumably due to the financial crises, but subsequently picked up again during 2000.

Exports from South Africa to India increased from R21 million in 1991 to R3 billion in 2000, which translates to a 78% annual average growth rate over the period. During this period, South African total exports grew by 15% *per annum* while the share of India's exports in total South African exports grew from 0.1% to 1.4%.

Row 11 shows the trade balance between South Africa and India, which was initially in favour of India except for the years 1994 and 1995. However, during the last two years, the balance has swung South Africa's way. Rows 12-16 present the analysis of total trade defined as the sum of imports and exports. South African total trade has been increasing at an average annual rate of 16%, as shown in row 15. Growth in trade between the two countries has been increasing at an average of 57% *per annum*, while the share of South Africa-India trade in South Africa's total trade increased from 0.1% to 1.2% over the period under review.

Table 1: Imports, exports and total trade

		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Ave 91-00
1.	South African Imports from India (Rm current pr)	82	110	165	406	711	1,112	1,561	1,705	1,566	1,765	
2.	Growth		32.8%	50.4%	146.4%	75.0%	56.5%	40.3%	9.2%	-8.1%	12.7%	45.9%
3.	South African Imports Total (Rm current pr)	45,850	52,569	58,987	71,059	100,241	115,984	129,834	147,454	149,642	184,131	
4.	Growth		14.7%	12.2%	20.5%	41.1%	15.7%	11.9%	13.6%	1.5%	23.0%	17.3%
5.	Indian share of South African imports	0.2%	0.2%	0.3%	0.6%	0.7%	1.0%	1.2%	1.2%	1.0%	1.0%	
6.	South African Export to India (Rm current pr)	21	21	94	491	707	1,072	1,339	1,628	2,365	2,950	
7.	Growth		0.4%	341.2%	420.5%	43.9%	51.6%	24.9%	21.5%	45.3%	24.8%	77.8%
8.	South African Exports Total (Rm current pr)	62,011	69,253	80,608	59,552	92,861	124,736	137,339	153,374	174,597	213,003	
9.	Growth		11.7%	16.4%	-26.1%	55.9%	34.3%	10.1%	11.7%	13.8%	22.0%	15.4%
10.	Indian share of South African exports	0.0%	0.0%	0.1%	0.8%	0.8%	0.9%	1.0%	1.1%	1.4%	1.4%	
11.	Trade Balance South Africa - India (Rm current pr)	-61	-88	-70	86	-3	-40	-222	-77	798	1,186	
12.												
13.	South African Trade with India (Rm current pr)	104	131	259	897	1,418	2,185	2,900	3,332	3,931	4,715	
14.	Growth		26.2%	97.9%	246.3%	58.0%	54.1%	32.8%	14.9%	18.0%	19.9%	57.4%
15.	South African Total Trade (Rm current pr)	107,861	121,822	139,596	130,611	193,101	240,720	267,173	300,828	324,239	397,134	
16.	Growth		12.9%	14.6%	-6.4%	47.8%	24.7%	11.0%	12.6%	7.8%	22.5%	16.2%
17.	Indian share of South African trade	0.1%	0.1%	0.2%	0.7%	0.7%	0.9%	1.1%	1.1%	1.2%	1.2%	

Source: Customs and Excise

2.2 Trade flows at the 22-chapter level

Table 2 shows nominal growth in imports and exports as well as the change in the patterns of trade at a slightly disaggregated level of 22 commodity chapters.

Table 2: Growth and patterns of South African imports from, exports to and total trade with India

#	Chapter	Imports			Exports			Total trade		
		Average growth	Average share	Average share	Average growth	Average share	Average share	Average growth	Average share	Average share
		1996-2000	1991-1995	1996-2000	1996-2000	1991-1995	1996-2000	1996-2000	1991-1995	1996-2000
		1	2	3	4	5	6	7	8	9
01	Live animals animal products	11.7%	1.3%	1.5%	7.2%	0.0%	0.0%	11.5%	0.7%	0.7%
02	Vegetable products	-0.8%	10.2%	17.0%	98.7%	0.1%	0.1%	-0.5%	5.4%	7.7%
04	Animal or vegetable fats and oils	41.0%	0.8%	0.8%	127.7%	0.0%	0.0%	42.2%	0.4%	0.4%
04	Prepared foodstuffs, beverages, tobacco	-18.9%	1.7%	2.1%	5.0%	0.3%	0.5%	-16.4%	1.0%	1.2%
05	Mineral products	59.7%	0.5%	0.8%	39.9%	10.5%	20.1%	40.4%	5.3%	11.4%
06	Products of chemical or allied industries	17.3%	9.2%	13.0%	42.7%	25.0%	28.5%	34.7%	16.7%	21.5%
07	Plastics and rubber	6.6%	2.1%	3.7%	18.1%	0.5%	0.5%	9.0%	1.3%	2.0%
08	Raw hides and skins, leather	8.5%	14.4%	7.6%	29.2%	0.3%	0.1%	8.9%	7.7%	3.5%
09	Wood, cork, straw	22.4%	0.3%	0.2%	11.8%	0.5%	0.3%	14.6%	0.4%	0.2%
10	Pulp, paper and paperboard, books	27.3%	0.8%	0.5%	44.7%	14.7%	7.6%	43.7%	7.4%	4.4%
11	Textiles, fabrics, clothing	5.4%	31.3%	20.1%	-18.2%	6.9%	2.4%	1.3%	19.7%	10.4%
12	Footwear, headgear, umbrellas	7.7%	2.3%	2.9%	473.2%	0.0%	0.0%	7.9%	1.2%	1.3%
13	Articles of stone asbestos ceramics glass	2.3%	1.9%	1.9%	53.4%	1.2%	0.1%	4.2%	1.6%	0.9%
14	Precious metals	80.1%	0.2%	1.4%	102.2%	0.0%	3.4%	77.4%	0.1%	2.5%
15	Base metals	23.6%	7.6%	9.4%	3.8%	35.9%	21.3%	8.2%	21.0%	15.9%
16	Machinery, mechanical and electrical	17.7%	9.4%	9.6%	6.7%	2.3%	3.4%	14.1%	6.0%	6.2%
17	Vehicles, aircraft, ships	-0.2%	2.5%	2.8%	8.7%	1.1%	2.3%	5.5%	1.8%	2.5%
18	Optical photograph measuring musical inst	12.9%	0.8%	1.0%	31.8%	0.5%	0.5%	12.7%	0.7%	0.7%
20	Miscellaneous manufactured articles	14.0%	2.6%	2.2%	-33.5%	0.0%	4.7%	2.7%	1.4%	3.6%
21	Works of art collectors pieces and antiques	-4.0%	0.1%	0.0%	117.3%	0.0%	0.0%	-0.3%	0.1%	0.0%
22	Other unclassified goods	0.0%	0.0%	0.0%	0.0%	0.0%	4.0%	0.0%	0.0%	2.2%
23	Spec class prov: orig equipm comp/	-14.6%	0.0%	1.3%	0.0%	0.0%	0.0%	-14.6%	0.0%	0.6%

Source: Customs and Excise and own calculations

The first three columns of Table 2 show imports from India for the last five years. In the first column, growth rates vary between -19% and 80%. The products with the highest growth rates are precious metals with 80%, followed by mineral products with 59.7%, and animal or vegetable oils and fats with 41%. The second and third columns measure the composition of imports for the first and second half of the 1990s. Textiles, fabrics and clothing show a decline in the second half of the 1990s from 30% to 20% and hides, skins and leather from

14% to 8%, while vegetable products show an increase from 10% to 17% and chemical products from 9% to 13%.

Commodities exported to India that show very high average growth from 1996-2000 are footwear, animal and vegetable fats and oils, precious metals, articles of stones, asbestos, ceramic glass, chemical products and mineral products. During the second half of the 1990s, exports to India were dominated by chemical products, basic metals and mineral products. Over the period of observation, these commodity groups accounted for about 70% of South Africa's export basket to India. Paper and pulp, precious metals, and textiles and clothing account for 7%, 3% and 2% respectively. Compared to the first half of the 1990s, the biggest gains in share have been made by mineral products (coal), followed by chemical products and precious metals, while paper and pulp and textiles and clothing have lost share. A summary of these findings is shown in the figures below. Figures 1 and 2 rank those commodities with above average growth in imports from and exports to India for the period 1996-2000. Figures 3 and 4 show the proportional contribution to imports from and exports to India over the same period.

Figure 1: Growth and patterns of imports from and exports to India for selected sectors
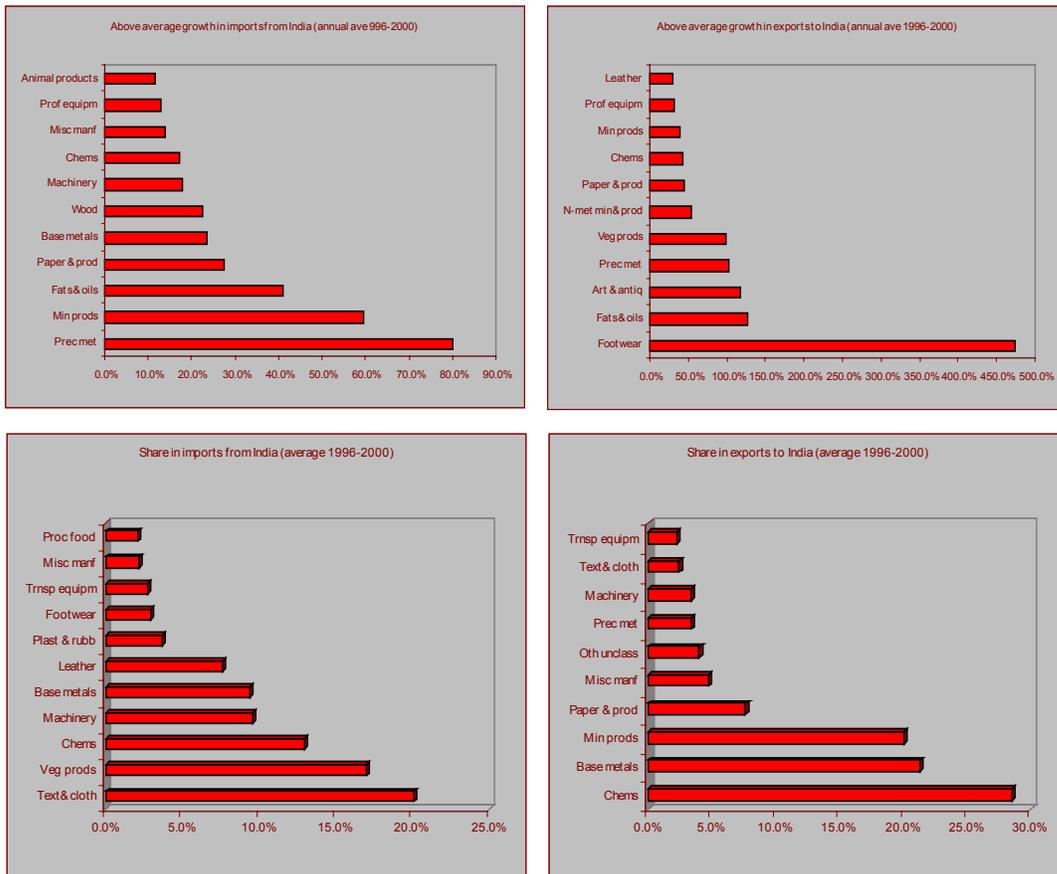
Source: Customs and Excise and own calculations

Broadly, the trade pattern between the two countries suggests that South Africa imports foodstuffs and textiles, and exports resource-based goods to India. Considerable inter-

industry trade is taking place in the chemicals group, although it should be noted that our analysis at this stage is undertaken at a rather aggregate level.

2.3 Trade flows at the HS4 level

Table 3 shows in more detail commodities that make a relatively high contribution to South Africa's import basket from India. Growth rates have been calculated over the period 1996-2000 and growth rates for commodities with zero import in any of these years have not been calculated. It can be seen that quite a number of high value HS4 commodity groups have shown growth that is higher than the average of 46% (see row 2 of Table 1), except some of the leather commodities. Note the appearance of (processed) diamonds (row 8) and some basic iron and steel (row 17) products.

Table 3: Imports from India at the four-digit HS code level for selected commodities

	HS4 code	Description	Imports 2000	% of total SA imports from India 2000	Growth rate in imports from India 1996-2000	% of SA imports in commodity 2000
1.	1006	Rice.	139,066,362	7.9%	45.6%	14.6%
2.	4104	Leather of bovine or equine animals, without hair on, other than leather of head	88,380,347	5.0%	4.8%	19.7%
3.	3004	Medicaments (excluding goods of heading no.30.02, 30.05 or 30.06) consisting of	73,816,612	4.2%	173.0%	2.1%
4.	6205	Men's or boys' shirts.	50,481,258	2.9%	58.5%	33.6%
5.	6403	Footwear with outer soles of rubber, plastics, leather or composition leather an	41,340,092	2.3%	16.4%	7.5%
6.	3808	Insecticides, rodenticides, fungicides, herbicides, anti-sprouting products and	39,915,372	2.3%	78.4%	5.6%
7.	3204	Synthetic organic colouring matter, whether or not chemically defined; preparati	32,973,683	1.9%	35.2%	7.0%
8.	7102	Diamonds, whether or not worked, but not mounted or set.	32,457,804	1.8%	1438.2%	1.0%
9.	6302	Bed linen, table linen, toilet linen and kitchen linen.	26,526,351	1.5%	16.2%	27.2%
10.	4106	Goat or kid skin leather, without hair on, (excluding than leather of headi 41.0	24,301,947	1.4%	7.6%	75.9%
11.	0306	Crustaceans, whether in shell or not, live, fresh, chilled frozen, dried, salted	24,241,576	1.4%	47.4%	28.6%
12.	5208	Woven fabrics of cotton, containing 85 % or more by mass of cotton, of a mass of	23,885,711	1.4%	5.8%	16.0%
13.	6206	Women's or girls' blouses, shirts and shirt-blouses.	22,930,362	1.3%	17.0%	31.8%
14.	6204	Women's or girls' suits, ensembles, jackets blazers, dresses, skirts, divided sk	22,253,518	1.3%	1.9%	16.0%
15.	9801	Original equipment components:	21,538,201	1.2%	67.9%	0.1%
16.	5509	Yarn (excluding sewing thread) of synthetic staple fibres, not put up for retail	19,658,103	1.1%	-13.0%	24.1%
17.	8481	Taps, cocks, valves and similar appliances for pipes, boiler shells, tanks, vats	19,514,724	1.1%	37.5%	2.4%
18.	7210	Flat-rolled products of iron or non-alloy steel, of a width of 600 mm or more, c	17,161,354	1.0%	179.8%	6.5%
19.	0910	Ginger, saffron, turmeric (curcuma), thyme, bay leaves, curry and other spices.	16,472,286	0.9%	29.3%	55.5%
20.	8409	Parts suitable for use solely or principally with the engines of heading no. 84.	16,094,995	0.9%	38.2%	2.4%
21.	9506	Articles and equipment for general physical exercise, gymnastics, athletics othe	15,916,832	0.9%	14.5%	4.6%
22.	8708	Parts and accessories of the motor vehicles of headings nos.87.01 to 87.05.	15,277,937	0.9%	12.6%	0.7%
23.	6406	Parts of footwear (including uppers whether or not attached to soles (excluding	13,920,685	0.8%	88.4%	13.5%
24.	8536	Electrical apparatus for switching or protecting electrical circuits or for maki	13,790,368	0.8%	24.4%	1.2%
25.	1302	Vegetable saps and extracts; pectic substances, pectinates and pectates; agar-ag	13,106,255	0.7%	40.1%	12.5%
26.	7222	Other bars and rods of stainless steel; angles, shapes and sections of stainless	12,877,971	0.7%	11.7%	16.3%
27.	6211	Track suits, ski suits and swimwear; other garments.	12,313,730	0.7%	18.5%	32.1%
28.	7323	Table, kitchen or other household articles and parts thereof, of iron or steel;	12,302,466	0.7%	37.0%	12.4%
29.	0909	Seeds of anise, badian, fennel, coriander, cumin, caraway or juniper berries.	11,689,986	0.7%	25.0%	48.0%
30.	8455	Metal-rolling mills and rolls therefor.	11,435,478	0.6%	21.5%	5.7%
31.	2916	Unsaturated acyclic monocarboxylic acids, cyclic monocarboxylic acids, their anh	11,276,902	0.6%	-34.9%	4.4%
32.	7208	Flat-rolled products of iron or non- alloy steel, of a width of 600 mm or more,	11,198,551	0.6%	na	na
33.	8540	Thermionic, cold cathode or photo- cathode valves and tubes (for example, vacuum	11,069,861	0.6%	9.1%	4.9%
34.	6109	T-shirts, singlets and other vests, knitted or crocheted.	10,947,072	0.6%	49.8%	13.7%
35.	5702	Carpets and other textile floor coverings, woven, not tufted or flocked, whether	10,823,668	0.6%	19.2%	29.0%
36.	1512	Sunflower-seed, safflower or cotton-seed oil and fractions thereof, whether or n	10,800,271	0.6%	na	na
37.	4202	Trunks, suitcases, vanity-cases, executive-cases, brief-cases, school satchels,	10,658,003	0.6%	30.3%	3.9%
38.	5007	Woven fabrics of silk or of silk waste.	10,549,946	0.6%	15.1%	44.2%
39.	2610	Chromium ores and concentrates.	10,071,265	0.6%	na	na
40.	6802	Worked monumental or building stone (excl. slate) and articles thereof (excl. go	9,682,217	0.5%	53.1%	12.7%
41.	3907	Polyacetals, other polyethers and epoxide resins, in primary forms; polycarbonat	9,616,204	0.5%	102.1%	1.6%
42.	8306	Bells, gongs and the like, non-electric, of base metal; statuettes and other orn	9,363,909	0.5%	28.4%	30.5%
43.	6307	Other made up articles, including dress patterns.	9,270,410	0.5%	24.7%	13.0%
44.	5515	Other woven fabrics of synthetic staple fibres.	9,212,703	0.5%	16.5%	8.3%
45.	8302	Base metal mountings, fittings and similar articles suitable for furniture, door	8,910,030	0.5%	15.6%	4.8%
46.	5205	Cotton yarn (excluding sewing thread), containing 85 % or more by mass of cotton	8,905,841	0.5%	52.3%	17.8%
47.	3920	Other plates, sheets, film, foil and strip, of plastics, non-cellular and not re	8,171,515	0.5%	-1.3%	1.5%
48.	2836	Carbonates; peroxocarbonates (percarbonates); commercial ammonium carbonate cont	8,009,579	0.5%	34.7%	5.2%
49.	8539	Electric filament or discharge lamps, including sealed beam lamp units and ultra	7,925,136	0.4%	31.5%	2.5%
50.	4010	Conveyor or transmission belts or belting, of vulcanised rubber.	7,844,788	0.4%	121.1%	5.4%

Source: Customs and Excise and own calculations

In the last table of this section, we show the same kind of information for South African exports to India. The top HS4 commodities are all part of the minerals, basic metals and chemicals groups. With an average growth of 78% *per annum*, it can be seen that only a few of the top 50 HS4 commodities are displaying relatively high growth in exports to India. Exceptions are uncoated paper and paper board (see row 12), some chemical products (see rows 14 and 22), asbestos (row 25), complete building structures (see row 29) and diamonds (row 30). The latter suggests evidence of inter-industry trade in the relatively narrow HS4 commodity group of processed diamonds, with presumably some cutting and processing of South African and Botswana diamonds taking place in India.

Table 4: Exports to India at the 4-digit HS code level for selected commodities

	HS4 code	Description	Imports 2000	% of total SA exports 2000	Growth rate 1996-2000	% of SA exports in commodity 2000
1.	2809	Diphosphorus pentaoxide; phosphoric acid and polyphosphoric acids.	719,741,865	24.6%	41.0%	95.5%
2.	2701	Coal; briquettes, ovoids and similar solid fuels manufactured from coal.	507,433,481	17.4%	46.9%	5.5%
3.	9999	Not elsewhere classified	375,486,461	12.9%	na	na
4.	4702	Chemical wood pulp, dissolving grades.	227,501,920	7.8%	46.5%	9.3%
5.	7208	Flat-rolled products of iron or non- alloy steel, of a width of 600 mm or more,	182,375,865	6.2%	57.0%	9.4%
6.	2835	Phosphinates (hypophosphites), phospho- nates (phosphites), phosphates and polyp	87,082,555	3.0%	61.0%	20.3%
7.	7108	Gold (including gold plated with platinum) unwrought or in semi- manufactured fo	69,250,096	2.4%	na	na
8.	3603	Safety fuses; detonating fuses; percussion or detonating caps; igniters; electri	60,225,048	2.1%	na	na
9.	2914	Ketones and quinones, whether or not with other oxygen function, and their halog	49,588,753	1.7%	15.4%	9.1%
10.	8407	Spark-ignition reciprocating or rotary internal combustion piston engines.	46,661,403	1.6%	na	na
11.	7204	Ferrous waste and scrap; remelting scrap ingots of iron or steel.	39,690,292	1.4%	17.5%	19.6%
12.	4802	Uncoated paper and paperboard, of a kind used for writing, printing or other gra	37,650,234	1.3%	239.0%	6.2%
13.	7202	Ferro-alloys.	34,627,599	1.2%	-0.8%	0.4%
14.	2712	Petroleum jelly; paraffin wax, micro- crystalline petroleum wax, slack wax, ozok	26,134,398	0.9%	247.1%	4.9%
15.	7601	Unwrought aluminium.	26,046,464	0.9%	-34.2%	0.5%
16.	7106	Silver (including silver plated with gold or platinum), unwrought or in semi-man	20,294,914	0.7%	na	na
17.	7210	Flat-rolled products of iron or non-alloy steel, of a width of 600 mm or more, c	20,156,418	0.7%	24.1%	2.1%
18.	8421	Centrifuges, including centrifugal dryers; filtering or purifying machinery and	17,893,666	0.6%	25.1%	0.4%
19.	8002	Tin waste and scrap.	16,704,132	0.6%	na	na
20.	7219	Flat-rolled products of stainless steel, of a width of 600 mm or more.	15,879,318	0.5%	-13.2%	0.5%
21.	7224	Other alloy steel in ingots or other primary forms; semi-finished products of ot	15,403,164	0.5%	na	na
22.	2905	Acyclic alcohols and their halogenated, sulphonated, nitrated or nitrosated deri	15,239,863	0.5%	90.5%	6.1%
23.	7209	Flat-rolled products of iron or non-alloy steel, of a width of 600 mm or more, c	14,690,010	0.5%	51.7%	3.6%
24.	7207	Semi-finished products of iron or non- alloy steel.	13,739,586	0.5%	76.6%	2.8%
25.	2524	Asbestos.	13,610,471	0.5%	79.7%	21.3%
26.	2710	Petroleum oils and oils obtained from bituminous minerals, other than crude; pre	13,602,385	0.5%	28.3%	0.2%
27.	5402	Synthetic filament yarn (excluding sewing thread), not put up for retail sale, i	12,655,585	0.4%	33.1%	3.6%
28.	2707	Oils and other products of the distillation of high temperature coal tar; simila	9,385,550	0.3%	17.9%	4.8%
29.	7308	Structures (excl. prefabricated buildings of heading no. 94.06) and parts of struc	8,972,631	0.3%	782.7%	1.1%
30.	7102	Diamonds, whether or not worked, but not mounted or set.	8,057,379	0.3%	145.2%	0.1%
31.	4804	Uncoated kraft paper and paperboard, in rolls or sheets, other than that of head	8,056,000	0.3%	na	na
32.	7602	Aluminium waste and scrap.	7,808,201	0.3%	56.3%	4.2%
33.	4801	Newsprint, in rolls or sheets.	7,271,493	0.2%	-11.9%	1.8%
34.	5503	Synthetic staple fibres, not carded, combed or otherwise processed for spinning.	7,083,363	0.2%	37.2%	7.3%
35.	4403	Wood in the rough, whether or not stripped of bark or sapwood, or roughly square	6,598,339	0.2%	8.9%	5.0%
36.	3812	Prepared rubber accelerators; compound plasticisers for rubber or plastics, n.e.	6,374,026	0.2%	na	na
37.	7304	Tubes, pipes and hollow profiles, seamless, of iron (excluding cast iron) or ste	6,244,317	0.2%	73.4%	2.6%
38.	7404	Copper waste and scrap.	6,107,605	0.2%	3.7%	2.0%
39.	8207	Interchangeable tools for hand tools whether or not power-operated or for machin	4,938,687	0.2%	-41.7%	1.7%
40.	7902	Zinc waste and scrap.	4,936,461	0.2%	71.6%	56.2%
41.	8542	Electronic integrated circuits and microassemblies.	4,808,800	0.2%	111.2%	3.9%
42.	8609	Containers (including containers for the transport of fluids) specially designed	4,771,590	0.2%	-19.0%	0.2%
43.	5201	Cotton, not carded or combed.	4,414,218	0.2%	na	na
44.	5102	Fine or coarse animal hair, not carded or combed.	4,365,940	0.1%	-28.0%	6.9%
45.	2907	Phenols; phenol-alcohols.	4,215,759	0.1%	-12.6%	2.9%
46.	4819	Cartons, boxes, cases, bags and other packing containers, of paper, paperboard,	4,032,942	0.1%	130.5%	2.0%
47.	7216	Angles, shapes and sections of iron or non-alloy steel.	4,011,816	0.1%	-19.0%	0.4%
48.	4002	Synthetic rubber and factice derived from oils, in primary forms or in plates, s	3,651,778	0.1%	24.6%	3.1%
49.	2833	Sulphates; alums; peroxosulphates (persulphates).	3,241,878	0.1%	na	na
50.	7201	Pig iron and spiegeleisen in pigs, blocks or other primary forms.	2,986,059	0.1%	-1.9%	0.6%

Source: Customs and Excise and own calculations

2.4 Intra-industry Trade between South Africa and India

Of considerable interest to policy-makers is the potential for intra-industry trade. Identification of commodities with high intra-industry trade indices in trade with India relative to trade with the rest of the world would greatly facilitate negotiations, as both parties are expected to benefit from free trade on such commodities. The intra-industry trade index is the difference between total trade and the absolute value of net trade divided by total trade of a commodity. It should be noted that the intra-industry trade index only becomes relevant at a relatively high level of disaggregation and we can only present results with regard to South Africa's trade.

Table 5: Intra-industry indices for South African trade with India and the rest of the world, 2000 (R '000)

	HS4	HS4 Description	Exports to India	Total export	Imports from India	Total Imports	Intra-industry trade index for trade with India	Intra-industry trade index for trade with RoW	IIT India / IIT total exports
1.	3923	Articles for the conveyance or packing of goods, o….	1,034,480	276,879,651	2,101,901	287,450,210	0.66	0.02	38.96
2.	8607	Parts of railway or tramway locomotives or rolling….	869,910	65,358,795	476,787	62,646,669	0.71	0.02	38.67
3.	3307	Pre-shave, shaving or after-shave preparations, pe….	194,856	90,393,707	3,269,426	94,177,511	0.11	0.00	28.73
4.	1209	Seeds, fruit and spores, of a kind used for sowing….	189,749	110,137,264	110,974	104,198,834	0.74	0.03	26.96
5.	7304	Tubes, pipes and hollow profiles, seamless, of iro….	6,244,317	238,786,447	6,169,324	211,581,716	0.99	0.06	16.05
6.	2803	Carbon (carbon blacks and other forms of carbon no….	1,007,211	28,656,945	1,000,688	24,896,414	1.00	0.07	13.69
7.	6914	Other ceramic articles.	157,542	6,092,637	13,156	5,804,672	0.15	0.01	12.59
8.	8207	Interchangeable tools for hand tools whether or no….	4,938,687	298,823,865	4,542,406	352,142,250	0.96	0.08	11.44
9.	5402	Synthetic filament yarn (excluding sewing thread),….	12,655,58	351,331,920	7,198,769	392,026,472	0.73	0.06	11.37
10.	8702	Motor vehicles for the transport of ten or more pe….	350,000	65,800,670	360,284	53,703,773	0.99	0.10	9.67
11.	6804	Millstones, grindstones, grinding wheels and the l….	524,079	34,576,452	1,060,200	41,400,957	0.66	0.08	7.83
12.	9023	Instruments, apparatus and models, designed for de….	315,929	35,151,408	91,110	40,780,041	0.45	0.08	5.78
13.	8703	Motor cars and other motor vehicles principally de….	531,934	7,894,134,797	384,645	5,780,945,296	0.84	0.15	5.43
14.	7103	Precious stones (excluding diamonds) and semi-prec….	2,038,280	31,071,610	874,698	24,002,647	0.60	0.11	5.30
15.	7314	Cloth (including endless bands), grill, netting an….	48,360	39,278,965	226,502	46,894,548	0.35	0.09	4.06
16.	4011	New pneumatic tyres, of rubber.	77,678	812,346,341	2,650,776	840,459,781	0.06	0.02	3.68
17.	8708	Parts and accessories of the motor vehicles of hea….	2,096,860	2,519,790,519	15,277,93	2,218,865,250	0.24	0.07	3.63
18.	2201	Waters, including natural or artificial waters and….	4,590	9,375,173	1,822	6,749,904	0.57	0.16	3.49
19.	1702	Other sugars, including chemically pure lactose, m….	95,357	31,705,726	26,094	40,783,733	0.43	0.13	3.40
20.	8438	Machinery, not specified or included elsewhere in ….	1,565,466	191,745,414	1,090,576	346,265,521	0.82	0.29	2.84
21.	8716	Trailers and semi-trailers; other vehicles, not me….	182,295	165,572,386	80,878	104,324,995	0.61	0.23	2.71
22.	8530	Electrical signalling, safety or traffic control e….	115,596	35,245,227	172,724	18,501,122	0.80	0.31	2.55
23.	4910	Calendars of any kind, printed, including calendar….	4,630	4,858,332	45,415	5,693,466	0.19	0.08	2.45
24.	2825	Hydrazine and hydroxylamine and their inorganic sa….	130,785	192,140,857	106,743	86,172,843	0.90	0.38	2.36
25.	8544	Insulated (including enamelled or anodised) wire, ….	378,043	542,259,747	6,255,437	495,612,691	0.11	0.05	2.24
26.	8311	Wire, rods, tubes, plates, electrodes and similar ….	703,193	30,792,795	269,597	50,589,390	0.55	0.25	2.20
27.	2202	Waters, including mineral waters and aerated water….	2,306	266,635,269	1,755	111,505,556	0.86	0.41	2.11
28.	8431	Parts suitable for use solely or principally with ….	2,272,970	320,103,554	1,742,716	785,306,075	0.87	0.42	2.05
29.	8205	Hand tools (including glaziers' diamonds), not els….	539,812	111,233,756	4,411,450	141,502,974	0.22	0.11	2.05
30.	7217	Wire of iron or non-alloy steel.	2,085,990	199,066,140	2,393,184	74,538,695	0.93	0.46	2.01
31.	3801	Artificial graphite; colloidal or semi- colloidal ….	28,935	47,510,378	67,710	90,819,541	0.60	0.31	1.91
32.	3824	Prepared binders for foundary moulds or cores; ….	1,198,419	158,663,005	908,893	500,630,479	0.86	0.52	1.66
33.	2905	Acyclic alcohols and their halogenated, sulphonate….	15,239,86	249,455,807	2,829,347	347,306,287	0.31	0.19	1.64
34.	3809	Finishing agents, dye carriers to accelerate the d….	110,996	33,414,076	76,390	101,815,136	0.82	0.51	1.61
35.	9618	Tailors' dummies and other lay figures; automata a….	500	2,340,096	8,442	2,700,169	0.11	0.07	1.60
36.	7210	Flat-rolled products of iron or non-alloy steel, o….	20,156,41	940,407,086	17,161,35	264,946,438	0.92	0.58	1.60
37.	9703	Original sculptures and statuary, in any material……	113,674	44,168,006	96,914	11,332,268	0.92	0.59	1.55
38.	4415	Packing cases, boxes, crates, drums and similar pa….	50,620	95,652,680	34,325	30,121,949	0.81	0.52	1.55
39.	7019	Glass fibres (including glass wool) and articles t….	95,980	56,750,192	25,089	99,721,413	0.41	0.28	1.51
40.	8543	Electrical machines and apparatus, having individu….	121,935	95,095,204	94,884	389,007,952	0.88	0.61	1.44
41.	3506	Prepared glues and other prepared adhesives, not e….	90,187	22,441,346	113,312	99,353,125	0.89	0.63	1.40
42.	9032	Automatic regulating or controlling instruments an….	328,258	99,781,634	296,091	519,635,790	0.95	0.68	1.40
43.	9608	Ball point pens; felt tipped and other porous-tipp….	2,100,000	27,392,189	1,914,915	137,936,661	0.95	0.69	1.39
44.	4911	Other printed matter, including printed pictures a….	136,229	57,373,550	490,665	110,516,234	0.43	0.32	1.38
45.	8538	Parts suitable for use solely or principally with ….	1,304,118	64,405,632	968,002	279,510,683	0.85	0.63	1.35
46.	6812	Fabricated asbestos fibres; mixtures with a basis ….	20,794	18,478,056	61,430	8,424,998	0.51	0.38	1.34
47.	7020	Other articles of glass.	2,195	16,128,019	11,855	9,948,886	0.31	0.24	1.32
48.	9030	Oscilloscopes, spectrum analysers and other instru….	1,571,409	60,491,005	1,040,208	247,619,847	0.80	0.61	1.30
49.	4407	Wood sawn or chipped lengthwise, sliced or peeled,….	351,030	104,419,752	255,503	506,116,885	0.84	0.66	1.28
50.	8501	Electric motors and generators (excluding generati….	1,796,264	99,677,568	2,948,924	398,027,429	0.76	0.60	1.26

Source: Customs & Excise and own calculations

For those commodity groups where an IIT for trade between India and SA can be calculated, a comparison with the IIT on trade between the RoW and SA is drawn by taking the ration of the two. The results of this component of the analysis suggest considerable intraindustry trade

exists for a wide range of HS4 product groups. Most notable are a number of groups associated to motor vehicles, accessories and tyres. Otherwise, no particular pattern emerges here with a few metal products and machinery and equipment represented as well as the odd clothing group.

2.5 Trade intensities between South Africa and India

In the previous section we looked at trade patterns between South Africa and India. However, it is also important to evaluate bilateral trade in relation to the respective country's exports to the rest of the world. Although this has to some degree been achieved, we examine in this section the effects of changes in trade patterns between South Africa and India by calculating import and export intensity. These measures are determined for SACU in relation to India for the period 1990-1998. The import intensity index is an index of intensity of India's (South Africa's) export trade with South Africa (India) relative to its exports to the rest of the world.

It can be noted that:

- If the value of the index is greater than 1: This indicates a greater intensity in the bilateral trading relationship between South Africa and India relative to the latter's trade with the rest of the world.
- If the value of the index is equal to 1: Trade is not geographically biased, and bilateral relations between the two countries are the same as their trade with the world.
- If the value of the index is less than 1: This indicates relatively low intensities in bilateral trade between the two countries.

As a data source, we use UNComTrade data published by Statistics Canada as part of their World Trade Analyser system. The results are shown in the next figure.

Figure 2: Trade intensities between South Africa and India
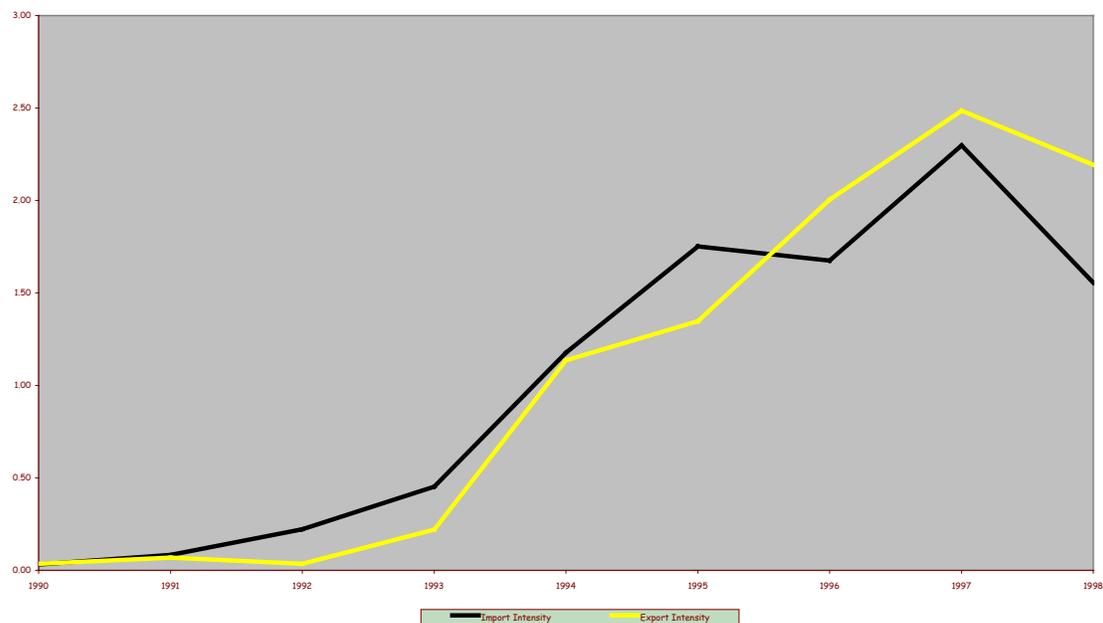
Source: own calculations

It can be seen that since 1994, trade between South Africa and India is more intense relative to trade of either country with the rest of the world. The slight decline in the intensities of the very last year may be because of the Asian crisis.

2.6 Tariffs on trade between South Africa and India

We continue this section with a short comment on the tariff structure on trade between South Africa and India. With regard to South African imports from India and the MFN-applied tariffs, we make use of Customs and Excise data for the trade flows at the HS8 level. As is discussed elsewhere, a small part of South Africa's imports face non-*ad valorem* duties. For South Africa's total import basket, this is not more than 4.5%. However, due to the composition of imports from India, the proportion of non-*ad valorem* imports is almost 17%. Given that total imports from India are about R1.8 billion, non-*ad valorem* imports are almost R300 million. Most of these imports take place in the textiles and clothing commodity groups and because the fraction of non-*ad valorem* imports of total imports is relatively high, we have decided to convert them to *ad valorem* equivalents. For a more detailed outline of the conversion methodology see van Seventer (2001).

Further aggregation to the HS4, HS2 and 22-chapter level is possible in an unweighted fashion or using import weights. South Africa's imports from India, their share in total imports from India, the unweighted and import weighted tariffs on the imports from India and from the rest of the world are shown in the next table. In the top row it can be seen that total imports from India mounted to about R1.8 billion in 2000. The import-weighted tariff on imports from India is 12%. Taking simple averages across the HS8 commodity lines for which South Africa is importing from India, we calculate 11%.

Table 6: South African imports and import weighted and unweighted tariffs for 22 chapters (2000, Rand '000 and July 2000 respectively)

	CH22 code	CH22 Descriptions	Imports from India (R '000)	Share of total South African imports	Unweigh-ted tariffs on imports from India	Import weighted tariffs on imports from India
		Total/average	1,764,805	100.0%	10.6%	12.1%
1.	01	Live animals; animal products	31,415	1.8%	0.3%	3.6%
2.	02	Vegetable products	215,485	12.2%	1.3%	6.6%
3.	03	Animal or vegetable fats and oils and their cleavage	22,189	1.3%	0.5%	4.2%
4.	04	Prepared foodstuffs; beverages, spirits and vinegar; tobacco etc	13,722	0.8%	11.1%	13.8%
5.	05	Mineral products	20,155	1.1%	0.1%	1.9%
6.	06	Products of the chemical or allied industries	290,793	16.5%	2.1%	2.9%
7.	07	Plastics and articles thereof; rubber and articles thereof	64,561	3.7%	10.7%	10.7%
8.	08	Raw hides and skins, leather, furskins and articles	132,701	7.5%	6.3%	15.7%
9.	09	Wood and articles of wood; wood charcoal; cork and articles	4,375	0.2%	18.0%	9.7%
10.	10	Pulp of wood or of other fibrous cellulosic material; waste and scrap of paper etc	12,727	0.7%	6.3%	9.0%
11.	11	Textiles and textile articles	332,046	18.8%	29.7%	26.6%
12.	12	Footwear, headgear, brollies, sun brollies, walking-sticks, seat-sticks, whips etc	57,308	3.2%	27.5%	24.4%
13.	13	Articles of stone, plaster, cement, asbestos etc	35,170	2.0%	8.3%	7.5%
14.	14	Natural or cultured pearls, precious or semi-precious stones, precious metals etc	39,315	2.2%	3.0%	12.6%
15.	15	Base metals and articles of base metal	174,942	9.9%	7.7%	7.6%
16.	16	Machinery and mechanical appliances; electrical equipment; parts thereof	199,618	11.3%	7.0%	4.2%
17.	17	Vehicles, aircraft, vessels and associated transport equipment	34,373	1.9%	11.5%	11.1%
18.	18	Optical, Photographic, cinematographic, measuring, checking, precision, medical	19,130	1.1%	1.2%	0.5%
19.	20	Miscellaneous manufactured articles	38,998	2.2%	6.1%	10.7%
20.	21	Works of art, collectors' pieces and antiques	762	0.0%	0.0%	0.0%
21.	22	Other unclassified goods and balance of payments adjustments	3,484	0.2%	0.0%	0.0%

Source: Customs and Excise, DTI and own calculations, note: only ad valorem tariffs are considered

Relatively high tariffs are imposed on textiles and footwear (see rows 11 and 12). Textiles also represent a high value in this particular aggregation scheme. Another large cluster of commodities is vegetable products (see row 2), chemical products (see row 6), and basic metals (row 15), the imports of which are faced with relatively low tariffs.

The next table shows the same results at the HS2 level with imports and their respective import weighted and unweighted tariffs for the first 50 lines, ranked according to the unweighted tariff level. As before, high unweighted tariffs are imposed on textile and clothing imports. Relatively low tariffs are levied on imports of electrical machinery (see row 46) and metal products (see rows 43 and 44).

If we rank the imports at the HS2 level according the value of imports, it can be seen that on the largest HS2 group, which is cereals, there are no tariffs. Other HS2 commodity groups with a relatively high value of imports from India and low duties are hides, skins and leather, machinery, electrical machinery, pharmaceutical products and organic chemicals. Textiles, clothing and footwear are typically the HS2 commodity groups with a relatively high value that is faced with a relatively high tariff (see rows 2, 8, 13, 14, 18, 27 and 28).

Table 7: South African imports and import weighted and unweighted tariffs for the HS2 level of commodity aggregation ranked according to the value of imports tariff (2000, R '000 and July 2000 respectively)

	HS2 code	HS2 descriptions	Imports from India (R '000)	Share of total South African imports	Import weighted tariffs on imports from India	Unweigh-ted tariffs on imports from India
		Total / average	1,764,805	100.0%	10.6%	12.1%
1.	10	Cereals	139,066	7.9%	0.0%	0.0%
2.	62	Articles of apparel and clothing accessories, not knitted or crocheted	120,340	6.8%	38.5%	38.5%
3.	41	Raw hides and skins (excluding furskins) and leather	113,385	6.4%	2.6%	4.7%
4.	84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof.	110,055	6.2%	4.6%	3.0%
5.	85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television im….	89,563	5.1%	9.9%	5.7%
6.	30	Pharmaceutical products.	78,306	4.4%	0.6%	1.3%
7.	29	Organic chemicals.	74,411	4.2%	0.8%	1.0%
8.	64	Footwear, gaiters and the like; parts of such articles	56,673	3.2%	27.5%	25.3%
9.	73	Articles of iron or steel.	55,172	3.1%	10.5%	6.1%
10.	72	Iron and steel.	54,703	3.1%	3.3%	3.2%
11.	38	Miscellaneous chemical products.	47,600	2.7%	6.5%	3.2%
12.	32	Tanning or dyeing extracts, tannins and their derivatives; dyes, pigments and other colouring matter….	42,963	2.4%	0.1%	1.9%
13.	63	Other made up textile articles; sets; worn clothing and worn textile articles; rags	42,371	2.4%	36.8%	33.5%
14.	52	Cotton	39,458	2.2%	22.0%	22.0%
15.	71	Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with prec….	39,315	2.2%	3.0%	12.6%
16.	09	Coffee, tea, mate and spices	38,792	2.2%	4.3%	4.2%
17.	39	Plastics and articles thereof.	37,972	2.2%	10.2%	10.1%
18.	55	Man-made staple fibres.	33,111	1.9%	22.0%	21.6%
19.	87	Vehicles (excluding railway or tramway rolling-stock) and parts and accessories thereof.	32,730	1.9%	12.0%	11.6%
20.	03	Fish and crustaceans, molluscs and other aquatic invertebrates	31,399	1.8%	0.3%	2.5%
21.	28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of rad….	31,054	1.8%	0.7%	0.7%
22.	82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal.	27,428	1.6%	12.2%	10.3%
23.	40	Rubber and articles thereof.	26,589	1.5%	11.2%	11.4%
24.	83	Miscellaneous articles of base metal.	22,510	1.3%	6.3%	12.3%
25.	15	Animal or vegetable fats and oils and their cleavage products; edible fats; animal or vegetable waxes….	22,189	1.3%	0.5%	4.2%
26.	98	Special classifications provisions	21,538	1.2%	35.0%	35.0%
27.	61	Articles of apparel and clothing accessories, knitted or crocheted	20,576	1.2%	39.9%	39.3%
28.	42	Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles of….	19,313	1.1%	27.7%	26.3%
29.	90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instrume….	18,583	1.1%	1.2%	0.7%
30.	13	Lac; gums, resins and other vegetable saps and extracts	18,397	1.0%	0.2%	5.6%
31.	95	Toys, games and sports requisites; parts and accessories thereof.	16,828	1.0%	0.2%	3.7%
32.	68	Articles of stone, plaster, cement, asbestos, mica or similar materials	16,580	0.9%	4.4%	4.5%
33.	57	Carpets and other textile floor coverings.	16,517	0.9%	30.0%	30.0%
34.	54	Man-made filaments	15,456	0.9%	18.0%	20.2%
35.	26	Ores, slag and ash.	12,619	0.7%	0.0%	0.0%
36.	96	Miscellaneous manufactured articles.	12,259	0.7%	8.0%	10.5%
37.	76	Aluminium and articles thereof	11,155	0.6%	6.3%	5.9%
38.	50	Silk	10,608	0.6%	0.0%	0.0%
39.	59	Impregnated, coated, covered or laminated textile fabrics; textile articles of a kind suitable for i….	10,439	0.6%	17.5%	12.2%
40.	33	Essential oils and resinoids; perfumery, cosmetic or toilet preparations.	10,032	0.6%	10.8%	13.3%
41.	94	Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; lamps a….	9,911	0.6%	13.8%	17.3%
42.	70	Glass and glassware.	9,879	0.6%	8.3%	8.5%
43.	53	Other vegetable textile fibres; paper yarn and woven fabrics of paper yarn.	9,747	0.6%	1.9%	3.4%
44.	69	Ceramic products.	8,710	0.5%	15.6%	10.5%
45.	08	Edible fruit and nuts; peel of citrus fruit or melons	7,493	0.4%	0.5%	9.2%
46.	25	Salt, sulphur, earths and stone, plastering materials, lime and cement.	7,490	0.4%	0.2%	1.5%
47.	49	Printed books, newspapers, pictures and other products of the printing industry; manuscripts, typesc….	6,905	0.4%	1.9%	5.3%
48.	24	Tobacco and manufactured tobacco substitutes.	6,668	0.4%	10.4%	20.9%
49.	12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medical plants….	6,175	0.3%	9.1%	6.1%
50.	48	Paper and paperboard; articles of paper pulp, of paper or of paperboard	5,822	0.3%	11.5%	10.7%

Source: Customs and Excise, DTI and own calculations, note: only ad valorem tariffs are considered

These results are confirmed in the next table, where we also rank the imports and associated weighted and unweighted tariffs by value of imports.

Table 8: South African imports and import weighted and unweighted tariffs for the HS2 level of commodity aggregation ranked according to the unweighted tariff (2000, R '000 and July 2000 respectively)

	HS2 code	HS2 descriptions	Imports from India 2000 (R '000)	Share of total South African imports	Import weighted tariffs on imports from India	Unweigh-ted tariffs on imports from India
		Total / average	1,764,805	100.0%	10.6%	12.1%
1.	61	Articles of apparel and clothing accessories, knitted or crocheted	20,576	1.2%	39.9%	39.3%
2.	62	Articles of apparel and clothing accessories, not knitted or crocheted	120,340	6.8%	38.5%	38.5%
3.	98	Special classifications provisions	21,538	1.2%	35.0%	35.0%
4.	63	Other made up textile articles; sets; worn clothing and worn textile articles; rags	42,371	2.4%	36.8%	33.5%
5.	57	Carpets and other textile floor coverings.	16,517	0.9%	30.0%	30.0%
6.	66	Umbrellas, sun umbrellas, walking-sticks, seat sticks, whips, riding-crops and parts thereof	7	0.0%	26.8%	28.3%
7.	04	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified….	0	0.0%	28.2%	28.2%
8.	42	Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles of….	19,313	1.1%	27.7%	26.3%
9.	65	Headgear and parts thereof	507	0.0%	25.9%	25.7%
10.	17	Sugars and sugar confectionery	382	0.0%	21.5%	25.5%
11.	64	Footwear, gaiters and the like; parts of such articles	56,673	3.2%	27.5%	25.3%
12.	60	Knitted or crocheted fabrics.	961	0.1%	21.0%	22.6%
13.	52	Cotton	39,458	2.2%	22.0%	22.0%
14.	55	Man-made staple fibres.	33,111	1.9%	22.0%	21.6%
15.	24	Tobacco and manufactured tobacco substitutes.	6,668	0.4%	10.4%	20.9%
16.	54	Man-made filaments	15,456	0.9%	18.0%	20.2%
17.	06	Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage	85	0.0%	20.0%	20.0%
18.	58	Special woven fabrics; tufted textile fabrics; lace tapestries; trimmings; embroidery.	3,546	0.2%	24.3%	19.3%
19.	19	Preparations of cereals, flour, starch, or milk; pastrycooks products	925	0.1%	20.8%	17.9%
20.	94	Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; lamps a….	9,911	0.6%	13.8%	17.3%
21.	18	Cocoa and cocoa preparations	0	0.0%	17.0%	17.0%
22.	46	Manufactures of straw, of esparto or of other plaiting materials; basketware and wickerwork	580	0.0%	19.9%	16.7%
23.	67	Prepared feathers and down and articles made of feathers or of down; artificial flowers; articles of….	122	0.0%	19.9%	16.7%
24.	56	Wadding, felt and nonwovens; special yarns; twine, cordage, ropes and cables and articles thereof.	4,419	0.3%	17.3%	16.1%
25.	51	Wool, fine or coarse animal hair; horsehair yarn and woven fabric	4,495	0.3%	22.0%	15.0%
26.	34	Soap, organic surface-active agents, washing preparations, lubricating preparations, artificial waxe….	2,689	0.2%	19.2%	15.0%
27.	43	Furskins and artificial fur; manufactures thereof	3	0.0%	18.9%	15.0%
28.	20	Preparations of vegetables, fruit, nuts or other parts of plants.	1,068	0.1%	12.5%	14.4%
29.	33	Essential oils and resinoids; perfumery, cosmetic or toilet preparations.	10,032	0.6%	10.8%	13.3%
30.	71	Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with prec….	39,315	2.2%	3.0%	12.6%
31.	83	Miscellaneous articles of base metal.	22,510	1.3%	6.3%	12.3%
32.	59	Impregnated, coated, covered or laminated textile fabrics; textile articles of a kind suitable for i….	10,439	0.6%	17.5%	12.2%
33.	87	Vehicles (excluding railway or tramway rolling-stock) and parts and accessories thereof.	32,730	1.9%	12.0%	11.6%
34.	40	Rubber and articles thereof.	26,589	1.5%	11.2%	11.4%
35.	07	Edible vegetables and certain roots and tubers	3,567	0.2%	12.9%	11.0%
36.	48	Paper and paperboard; articles of paper pulp, of paper or of paperboard	5,822	0.3%	11.5%	10.7%
37.	96	Miscellaneous manufactured articles.	12,259	0.7%	8.0%	10.5%
38.	69	Ceramic products.	8,710	0.5%	15.6%	10.5%
39.	82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal.	27,428	1.6%	12.2%	10.3%
40.	39	Plastics and articles thereof.	37,972	2.2%	10.2%	10.1%
41.	44	Wood and articles of wood; wood charcoal	3,776	0.2%	17.8%	10.0%
42.	08	Edible fruit and nuts; peel of citrus fruit or melons	7,493	0.4%	0.5%	9.2%
43.	70	Glass and glassware.	9,879	0.6%	8.3%	8.5%
44.	21	Miscellaneous edible preparations.	2,117	0.1%	18.6%	7.8%
45.	36	Explosives; pyrotechnic products; matches; pyrophoric alloys: certain combustible preparations.	376	0.0%	4.9%	7.5%
46.	16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	1,842	0.1%	0.4%	7.1%
47.	73	Articles of iron or steel.	55,172	3.1%	10.5%	6.1%
48.	11	Products of the milling industry; malt; starches; inulin; wheat gluten	92	0.0%	2.5%	6.1%
49.	12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medical plants….	6,175	0.3%	9.1%	6.1%
50.	27	Mineral fuels, oils and products of their distillation; bituminous substances; mineral waxes.	46	0.0%	0.6%	6.0%

Source: Customs and Excise, DTI and own calculations, note: only ad valorem tariffs are considered

The next question is: Which HS2 commodities are expected to be of interest to Indian trade policy-makers when considering a FTA with South Africa? We employ UNCTAD's TRAINS

database and therefore results are expressed in US$. It also appears that a considerably lower number of commodities are imported by India from South Africa. At the HS6 level there are, according to TRAINS, only about 410 lines, compared with about 660 HS8 lines according to Customs and Excise (which aggregates into 610 HS6 lines). In spite of this discrepancy, we continue to employ the TRAINS database because it offers not only Indian imports from South Africa, but also information on imports from other sources, which is necessary for contextualisation.

In line with the presentation of tariffs on South African imports in Tables 6-8, we start with the aggregation level of the 22 chapters. In Table 9 it can be seen that the tariffs in India are considerably higher than shown for South Africa in Table 6, especially if we remember that the tariffs from the same TRAINS database are even lower (see footnote 1).

Table 9: Selected Indian imports and import weighted tariffs (1998, Rand '000)

	CH22 code	CH22 descriptions	Imports from South Africa (R '000)	Share of total imports from South Africa	Import weighted tariffs on imports from South Africa	Unweighted tariffs on imports from the rest of the World
		Total/average	496,633	1.2%	23.6%	25.4%
1.	01	Live animals; animal products	13	0.0%	10.0%	10.0%
2.	02	Vegetable products	1,637	0.2%	40.0%	40.0%
3.	03	Animal or vegetable fats and oils and their cleavage	44	0.0%	30.0%	30.0%
4.	04	Prepared foodstuffs; beverages, spirits and vinegar; tobacco etc	6,713	2.5%	2.8%	20.0%
5.	05	Mineral products	112,623	1.1%	3.2%	12.2%
6.	06	Products of the chemical or allied industries	86,770	1.7%	29.1%	27.7%
7.	07	Plastics and articles thereof; rubber and articles thereof	5,585	0.5%	30.9%	31.8%
8.	08	Raw hides and skins, leather, furskins and articles	752	0.5%	1.5%	4.0%
9.	09	Wood and articles of wood; wood charcoal; cork and articles	12,781	2.9%	1.5%	21.4%
10.	10	Pulp of wood or of other fibrous cellulosic material; waste and scrap of paper etc	12,768	1.4%	5.9%	17.0%
11.	11	Textiles and textile articles	10,291	1.2%	32.1%	31.4%
12.	12	Footwear, headgear, umbrellas, sun umbrellas, walking-sticks, seat-sticks, whips etc	1	0.0%	40.0%	40.0%
13.	13	Articles of stone, plaster, cement, asbestos etc	38	0.0%	40.0%	40.0%
14.	14	Natural or cultured pearls, precious or semi-precious stones, precious metals etc	126,176	1.9%	39.6%	28.6%
15.	15	Base metals and articles of base metal	93,382	2.8%	26.8%	27.2%
16.	16	Machinery and mechanical appliances; electrical equipment; parts thereof	18,938	0.3%	21.3%	23.6%
17.	17	Vehicles, aircraft, vessels and associated transport equipment	4,011	0.4%	40.0%	40.0%
18.	18	Optical, Photographic, cinematographic, measuring, checking, precision, medical	4,083	0.5%	20.0%	21.4%
19.	20	Miscellaneous manufactured articles	27	0.0%	40.0%	40.0%
20.	21	Works of art, collectors' pieces and antiques	0	0.0%	0.0%	10.0%

Source: UNCTAD TRAINS and own calculations

Judging from the last column of the table below in which we show the unweighted applied import tariffs, it can be seen that there are, compared to South Africa, clearly a lower number of tariffs in India: the top 16 tariffs are all exactly 40%. All of these HS2 commodities are also characterised by relatively low values of imports. The commodity group in row 33 has a weighted tariff of just under 40% and it captures about 25% of India's total imports from South Africa, which includes precious metals such as gold for jewellery. Another big export commodity for South Africa is the inorganic chemicals group 28 (see row 20) – which is faced with a 30% import tariff – as well as the iron and steel products of commodity group 72 (see row 36).

Table 10: Selected Indian imports and import weighted tariffs (1997, US$ '000) ranked according to the unweighted tariff

	HS2 code	HS2 descriptions	Imports from South Africa (R '000)	Share of total imports from South Africa	Import weighted tariffs on imports from South Africa	Unweighted tariffs on imports from the rest of the World
		Total/average	496,633	1.2%	23.6%	25.4%
1	08	Edible fruit and nuts; peel of citrus fruit or melons	1,637	0.5%	40.0%	40.0%
2	33	Essential oils and resinoids; perfumery, cosmetic or toilet preparations.	21	0.1%	40.0%	40.0%
3	34	Soap, organic surface-active agents, washing preparations, lubricating preparati…..	72	0.1%	40.0%	40.0%
4	40	Rubber and articles thereof.	523	0.2%	40.0%	40.0%
5	42	Articles of leather; saddlery and harness; travel goods, handbags and similar con…..	18	1.0%	40.0%	40.0%
6	53	Other vegetable textile fibres; paper yarn and woven fabrics of paper yarn.	15	0.1%	40.0%	40.0%
7	56	Wadding, felt and nonwovens; special yarns; twine, cordage, ropes and cables and…..	276	1.0%	40.0%	40.0%
8	57	Carpets and other textile floor coverings.	14	0.6%	40.0%	40.0%
9	58	Special woven fabrics; tufted textile fabrics; lace tapestries; trimmings; embro…..	22	0.1%	40.0%	40.0%
10	59	Impregnated, coated, covered or laminated textile fabrics; textile articles of a…..	112	0.1%	40.0%	40.0%
11	64	Footwear, gaiters and the like; parts of such articles	1	0.0%	40.0%	40.0%
12	68	Articles of stone, plaster, cement, asbestos, mica or similar materials	38	0.1%	40.0%	40.0%
13	83	Miscellaneous articles of base metal.	58	0.2%	40.0%	40.0%
14	87	Vehicles (excluding railway or tramway rolling-stock) and parts and accessories …..	4,011	1.0%	40.0%	40.0%
15	93	Arms and ammunition; parts and accessories thereof.	10	1.0%	40.0%	40.0%
16	96	Miscellaneous manufactured articles.	17	0.0%	40.0%	40.0%
17	54	Man-made filaments	2,024	2.3%	31.1%	33.0%
18	15	Animal or vegetable fats and oils and their cleavage products; edible fats; anima…..	44	0.0%	30.0%	30.0%
19	18	Cocoa and cocoa preparations	29	0.4%	30.0%	30.0%
20	28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-…..	69,493	5.8%	30.0%	30.0%
21	30	Pharmaceutical products.	194	0.2%	30.0%	30.0%
22	32	Tanning or dyeing extracts, tannins and their derivatives; dyes, pigments and ot…..	205	0.1%	30.0%	30.0%
23	39	Plastics and articles thereof.	5,062	0.7%	30.0%	30.0%
24	50	Silk	10	0.0%	30.0%	30.0%
25	55	Man-made staple fibres.	1,224	0.7%	30.0%	30.0%
26	73	Articles of iron or steel.	743	0.2%	30.0%	30.0%
27	74	Copper and articles thereof	7,771	1.2%	30.0%	30.0%
28	78	Lead and articles thereof.	376	0.9%	30.0%	30.0%
29	79	Zinc and articles thereof.	417	0.3%	30.0%	30.0%
30	81	Other base metals; cermets: articles thereof.	219	0.4%	30.0%	30.0%
31	91	Clocks and watches and parts thereof.	17	0.1%	30.0%	30.0%
32	38	Miscellaneous chemical products.	972	0.2%	29.7%	29.4%
33	71	Natural or cultured pearls, precious or semi-precious stones, precious metals, m…..	126,176	1.9%	39.6%	28.6%
34	85	Electrical machinery and equipment and parts thereof; sound recorders and reprod…..	4,036	0.2%	23.8%	27.6%
35	29	Organic chemicals.	15,572	0.8%	25.4%	27.0%
36	72	Iron and steel.	63,123	4.5%	28.2%	26.9%
37	48	Paper and paperboard; articles of paper pulp, of paper or of paperboard	2,979	0.6%	12.3%	26.4%
38	51	Wool, fine or coarse animal hair; horsehair yarn and woven fabric	6,067	3.2%	34.9%	26.0%
39	37	Photographic or cinematographic goods.	178	0.1%	25.0%	25.0%
40	82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of ba…..	10,120	9.8%	25.0%	25.0%
41	44	Wood and articles of wood; wood charcoal	12,781	3.0%	1.5%	21.4%
42	84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof.	14,902	0.3%	20.7%	21.0%
43	17	Sugars and sugar confectionery	6,214	4.6%	2.1%	20.0%
44	76	Aluminium and articles thereof	7,490	3.6%	20.0%	20.0%
45	90	Optical, photographic, cinematographic, measuring, checking, precision, medical …..	4,066	0.5%	20.0%	20.0%
46	25	Salt, sulphur, earths and stone, plastering materials, lime and cement.	11,390	3.0%	3.8%	17.5%
47	49	Printed books, newspapers, pictures and other products of the printing industry…	66	0.0%	11.2%	13.3%
48	52	Cotton	527	0.8%	1.1%	12.5%
49	27	Mineral fuels, oils and products of their distillation; bituminous substances; m…	97,730	1.0%	3.1%	10.5%
50	05	Products of animal origin, not elsewhere specified or included	13	0.2%	10.0%	10.0%

Source: UNCTAD TRAINS Database

Table 11: Selected Indian imports and import weighted tariffs (1997, US$ '000) ranked according to value of imports

	HS2 code	HS2 descriptions	Imports from South Africa (R '000)	Share of total imports from South Africa	Import weighted tariffs on imports from South Africa	Unweighted tariffs on imports from the rest of the World
		Total/average	496,633	1.2%	23.6%	25.4%
1	71	Natural or cultured pearls, precious or semi-precious stones, precious metals, m…	126,176	1.9%	39.6%	28.6%
2	27	Mineral fuels, oils and products of their distillation; bituminous substances; m…	97,730	1.0%	3.1%	10.5%
3	28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-…	69,493	5.8%	30.0%	30.0%
4	72	Iron and steel.	63,123	4.5%	28.2%	26.9%
5	29	Organic chemicals.	15,572	0.8%	25.4%	27.0%
6	84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof.	14,902	0.3%	20.7%	21.0%
7	44	Wood and articles of wood; wood charcoal	12,781	3.0%	1.5%	21.4%
8	25	Salt, sulphur, earths and stone, plastering materials, lime and cement.	11,390	3.0%	3.8%	17.5%
9	82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of ba…	10,120	9.8%	25.0%	25.0%
10	47	Pulp of wood or of other fibrous cellulosic material; waste and scrap of paper …	9,723	3.4%	3.9%	1.7%
11	74	Copper and articles thereof	7,771	1.2%	30.0%	30.0%
12	76	Aluminium and articles thereof	7,490	3.6%	20.0%	20.0%
13	17	Sugars and sugar confectionery	6,214	4.6%	2.1%	20.0%
14	51	Wool, fine or coarse animal hair; horsehair yarn and woven fabric	6,067	3.2%	34.9%	26.0%
15	39	Plastics and articles thereof.	5,062	0.7%	30.0%	30.0%
16	90	Optical, photographic, cinematographic, measuring, checking, precision, medical…	4,066	0.5%	20.0%	20.0%
17	85	Electrical machinery and equipment and parts thereof; sound recorders and reprod…	4,036	0.2%	23.8%	27.6%
18	87	Vehicles (excluding railway or tramway rolling-stock) and parts and accessories…	4,011	1.0%	40.0%	40.0%
19	26	Ores, slag and ash.	3,503	2.5%	5.2%	6.7%
20	75	Nickel and articles thereof	3,065	2.8%	10.0%	10.0%
21	48	Paper and paperboard; articles of paper pulp, of paper or of paperboard	2,979	0.6%	12.3%	26.4%
22	54	Man-made filaments	2,024	2.3%	31.1%	33.0%
23	08	Edible fruit and nuts; peel of citrus fruit or melons	1,637	0.5%	40.0%	40.0%
24	55	Man-made staple fibres.	1,224	0.7%	30.0%	30.0%
25	38	Miscellaneous chemical products.	972	0.2%	29.7%	29.4%
26	73	Articles of iron or steel.	743	0.2%	30.0%	30.0%
27	41	Raw hides and skins (excluding furskins) and leather	734	0.5%	0.5%	1.4%
28	52	Cotton	527	0.8%	1.1%	12.5%
29	40	Rubber and articles thereof.	523	0.2%	40.0%	40.0%
30	22	Beverages, spirits and vinegar.	470	2.7%	10.0%	10.0%
31	79	Zinc and articles thereof.	417	0.3%	30.0%	30.0%
32	78	Lead and articles thereof.	376	0.9%	30.0%	30.0%
33	56	Wadding, felt and nonwovens; special yarns; twine, cordage, ropes and cables and…	276	1.0%	40.0%	40.0%
34	81	Other base metals; cermets: articles thereof.	219	0.4%	30.0%	30.0%
35	32	Tanning or dyeing extracts, tannins and their derivatives; dyes, pigments and ot…	205	0.1%	30.0%	30.0%
36	30	Pharmaceutical products.	194	0.2%	30.0%	30.0%
37	37	Photographic or cinematographic goods.	178	0.1%	25.0%	25.0%
38	59	Impregnated, coated, covered or laminated textile fabrics; textile articles of a…	112	0.1%	40.0%	40.0%
39	34	Soap, organic surface-active agents, washing preparations, lubricating preparati…	72	0.1%	40.0%	40.0%
40	49	Printed books, newspapers, pictures and other products of the printing industry…	66	0.0%	11.2%	13.3%
41	31	Fertilizers.	63	0.0%	0.0%	0.0%
42	83	Miscellaneous articles of base metal.	58	0.2%	40.0%	40.0%
43	15	Animal or vegetable fats and oils and their cleavage products; edible fats; anima…	44	0.0%	30.0%	30.0%
44	68	Articles of stone, plaster, cement, asbestos, mica or similar materials	38	0.1%	40.0%	40.0%
45	18	Cocoa and cocoa preparations	29	0.4%	30.0%	30.0%
46	58	Special woven fabrics; tufted textile fabrics; lace tapestries; trimmings; embro…	22	0.1%	40.0%	40.0%
47	33	Essential oils and resinoids; perfumery, cosmetic or toilet preparations.	21	0.1%	40.0%	40.0%
48	42	Articles of leather; saddlery and harness; travel goods, handbags and similar con…	18	1.0%	40.0%	40.0%
49	96	Miscellaneous manufactured articles.	17	0.0%	40.0%	40.0%
50	91	Clocks and watches and parts thereof.	17	0.1%	30.0%	30.0%

Source: UNCTAD TRAINS Database

A better view of the relative importance of India's tariff structure for imports from South Africa is shown in the next table where we rank the contents of the previous table according to value of imports. It can easily be seen that most of HS2 commodity groups with the highest value are faced with relatively high import tariffs. Exceptions are group 27 (see row 2), which includes coal, and group 47, which includes paper and pulp products (row 10).

3 TRADE CREATION AND TRADE DIVERSION FOLLOWING A HYPOTHETICAL FTA BETWEEN SOUTH AFRICA AND INDIA

Since the aim of this study is to examine the impact of the proposed FTA between South Africa and India on the bilateral trade flows between the two countries, simulations are conducted with a static, partial equilibrium methodology.

3.1 Methodology

The methodology employed here is comparatively simple, with low data requirements, which can be used to evaluate the impact of changing tariff levels on trade patterns at a disaggregated commodity level. Following a hypothetical free trade arrangement between South Africa and India, the following changes in trade flows between the two countries and third countries can, amongst others, be distinguished:

❑ Trade creation, which measures the increase in South African imports from India due to a decrease in the relative price of these imports vis-à-vis domestically produced goods, resulting in a net increase in South Africa's total imports and a net decrease in South Africa's domestic production; and
❑ Trade diversion, which measures the increase in South African imports from India due to a decrease in the relative price of these imports vis-à-vis imports from other countries resulting in a different geographical composition of imports, whereby imports from India increase at the expense of imports from other sources, with no change in total South African imports.

Trade creation is considered to be welfare enhancing since relatively high-cost domestic production is replaced with lower-cost imports from India. Nevertheless, South Africa has to face the decline of local, albeit less efficient, production. Trade diversion is considered to be welfare lowering in that South Africa switches its source of imports from a more efficiently producing country to a less efficiently producing country, leading to a less efficient allocation of resources, although the total import bill remains unchanged. Operationalisation of the trade creation and trade diversion methodology follows from rewriting the relationships that define the elasticity of imports with regard to changes in the import price and the elasticity that defines the substitution of imports from one source to another following a change in the relative price, respectively. In particular, the import price elasticity drives the degree to which imports respond to changes in import prices following a change in the tariffs. The substitution elasticity between imports from two different sources (India versus the rest of the world) governs the extent to which imports are switched (or substituted) from one source to another following a change in the price of imports, again due to changes in tariffs. Further details are available in Appendix 2.

The methodologies rest on a number of restrictive assumptions, amongst others, the adoption of perfect substitution between imports from various sources in the case of trade creation. Although the methodology chosen here is probably a good first step, further refinement is recommended.

3.2 The data

For South Africa, we make use of Customs and Excise data at the HS8 digit level for SACU imports from India and from the rest of the world for 2000. Tariff duties for July 2000 were obtained from the DTI and are assumed to be representative for the full calendar year. This may be a strong assumption in practice, as tariffs can change on a monthly basis. On the other hand, the one of the purposes of South Africa's multi-year tariff phase-down commitment to the World Trade Organisation (WTO) is to create a stable environment for importers and investors.

Trade creation and trade diversion are critically dependent on the choice of the import price elasticity and the import substitution elasticity. With regard to the import price elasticities, Gumede (2000) has estimated a single value of 1.56 for the import price elasticity and Jachia and Teljeur (1998) use 1.50 for the substitution elasticity across all commodities. Clearly, a single elasticity that applies across all commodities is unsatisfactory. Recently, Gumede (2000) has made an attempt to estimate import price elasticities for a limited number of sectors. However, a number of estimations could not be used since either the signs of the estimated elasticity are in the wrong direction, i.e. suggesting that the import demand goes up with an increase in the price, or no estimates were recorded. The following results were considered to be useable for our purposes.

Table 12: Estimated import price elasticities used in the trade creation calculations

	22 Chapter Description	Sector	Estimated import price elasticity
1.	Unspecified	manf	-0.364
2.	Live animals animal products	manf	-0.364
3.	Vegetable products	manf	-0.364
4.	Animal or vegetable fats and oils	manf	-0.364
5.	Prepared foodstuffs, beverages, tobacco	manf	-0.364
6.	Mineral products	manf	-0.364
7.	Products of chemical or allied industries	chems	-0.301
8.	Plastics and rubber	chems	-0.301
9.	Raw hides and skins, leather	manf	-0.364
10.	Wood, cork, straw	manf	-0.364
11.	Pulp, paper and paperboard, books	manf	-0.364
12.	Textiles, fabrics, clothing	manf	-0.364
13.	Footwear, headgear, umbrellas	manf	-0.364
14.	Articles of stone asbestos ceramics glass	manf	-0.364
15.	Precious metals	manf	-0.364
16.	Base metals	manf	-0.364
17.	Machinery, mechanical and electrical	mach	-0.113
18.	Vehicles, aircraft, ships	manf	-0.364
19.	Optical photograph measuring musical inst	manf	-0.364
20.	Miscellaneous manufactured articles	manf	-0.364
21.	Works of art collectors pieces and antiques	manf	-0.364
22.	Other unclassified goods	manf	-0.364

Source: Gumede 2000

It can be seen that the estimated import price elasticities are much lower than the –1.56 used by Gumede (2000). As a result, the trade creation effect will be more than half the size if we use the estimates of Table 12 above compared to the single estimate of –1.56. In what follows, we will report South Africa's trade creation estimates for both sets of elasticities. Finally, on the export side, i.e. from the point of India's imports, we employ data on trade flows and tariffs from UNCTAD's TRAINS database as shown in Tables 8 and 9 above and use import demand and substitution elasticities of 1.5.

3.3 Trade creation and diversion results

We now turn to the results of the trade creation and trade diversion models, starting with South African imports, followed by Indian imports.

South African imports

Trade creation results for the top and bottom 25 HS2 commodities are shown in the next table, using the sector-specific elasticities of Gumede as well as the uniform elasticity suggested by Jachia and Teljeur. Since there are about 99 HS2 commodities and we report only on the top and bottom 50, we omit a great number of tariff lines, although this typically constitutes less than 10% of the total trade creation (or trade diversion).

Table 13: Potential trade creation in South Africa following a FTA with India using import price elasticities of Table 12, (R '000, 2000)

	HS2 code	HS2 Descriptions	Trade creation
		Total	51,584
1	62	Articles of apparel and clothing accessories, not knitted or crocheted	12,184
2	64	Footwear, gaiters and the like; parts of such articles	4,452
3	63	Other made up textile articles; sets; worn clothing and worn textile articles; rags	4,147
4	52	Cotton	2,590
5	55	Man-made staple fibres.	2,173
6	61	Articles of apparel and clothing accessories, knitted or crocheted	2,134
7	98	Special classifications provisions	2,033
8	73	Articles of iron or steel.	1,904
9	42	Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (excluding silk-worm gut)	1,523
10	57	Carpets and other textile floor coverings.	1,387
11	87	Vehicles (excluding railway or tramway rolling-stock) and parts and accessories thereof.	1,280
12	82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal.	1,082
13	41	Raw hides and skins (excluding furskins) and leather	1,060
14	39	Plastics and articles thereof.	1,059
15	84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof.	1,034
16	85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers…	910
17	38	Miscellaneous chemical products.	871
18	54	Man-made filaments	859
19	40	Rubber and articles thereof.	808
20	72	Iron and steel.	635
21	09	Coffee, tea, mate and spices	586
22	59	Impregnated, coated, covered or laminated textile fabrics; textile articles of a kind suitable for industrial use.	567
23	83	Miscellaneous articles of base metal.	485
24	94	Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; lamps and lighting fittings, not elsewhere spec…	437
25	69	Ceramic products.	428
74	04	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included	0
75	18	Cocoa and cocoa preparations	0
76	01	Live animals	0
77	02	Meat and edible meat offal	0
78	05	Products of animal origin, not elsewhere specified or included	0
79	10	Cereals	0
80	14	Vegetable plaiting materials; vegetable products not elsewhere specified or included	0
81	26	Ores, slag and ash.	0
82	31	Fertilizers.	0
83	45	Cork and articles of cork	0
84	47	Pulp of wood or of other fibrous cellulosic material; waste and scrap of paper or paperboard.	0
85	50	Silk	0
86	75	Nickel and articles thereof	0
87	78	Lead and articles thereof.	0
88	79	Zinc and articles thereof.	0
89	80	Tin and articles thereof.	0
90	81	Other base metals; cermets: articles thereof.	0
91	86	Railway or tramway locomotives, rolling-stock and parts thereof; railway or tramway track fixtures and fittings and parts thereof; mechanica…	0
92	88	Aircraft, spacecraft and parts thereof.	0
93	89	Ships, boats and floating structures.	0
94	91	Clocks and watches and parts thereof.	0
95	92	Musical instruments; parts and accessories of such articles.	0
96	93	Arms and ammunition; parts and accessories thereof.	0
97	97	Works of art, collectors' pieces and antiques.	0
98	99	Other unclassified goods.	0

Source: own calculations

In the first ten rows we see that most trade creation takes place in the textiles, clothing and leather industries with the exception of basic iron and steel fabricates and the special

classification provision. Further down, from row 10 to 25, we obtain a more diversified picture, with sectors such as electrical machinery, rubber, motor vehicles and parts. In the second half of the table, it can be seen that no trade creation can be expected in food products, other than iron and steel metal productions and some of the more basic chemicals.

Using a uniform import price elasticity, the commodity pattern looks very similar, although the total value of trade creation has now increased from R60 million to about R240 million, as can be seen in the next table. The reason, of course, is the higher import price elasticity that is now 1.56 as opposed to roughly 0.35 on average in Table 13.

Table 14: Potential trade creation in South Africa following a FTA with India using a uniform import price elasticities of 1.56 (R '000, 2000)

	HS2 code	HS2 descriptions	Trade creation
			236,082
1	62	Articles of apparel and clothing accessories, not knitted or crocheted	52,218
2	64	Footwear, gaiters and the like; parts of such articles	19,081
3	63	Other made up textile articles; sets; worn clothing and worn textile articles; rags	17,772
4	85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	12,557
5	52	Cotton	11,100
6	55	Man-made staple fibres.	9,314
7	61	Articles of apparel and clothing accessories, knitted or crocheted	9,147
8	98	Special classifications provisions	8,711
9	73	Articles of iron or steel.	8,159
10	84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof.	7,591
11	42	Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (excluding silk-worm gut)	6,528
12	57	Carpets and other textile floor coverings.	5,946
13	39	Plastics and articles thereof.	5,490
14	87	Vehicles (excluding railway or tramway rolling-stock) and parts and accessories thereof.	5,486
15	82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal.	4,637
16	41	Raw hides and skins (excluding furskins) and leather	4,545
17	38	Miscellaneous chemical products.	4,513
18	40	Rubber and articles thereof.	4,188
19	54	Man-made filaments	3,680
20	72	Iron and steel.	2,721
21	09	Coffee, tea, mate and spices	2,512
22	59	Impregnated, coated, covered or laminated textile fabrics; textile articles of a kind suitable for industrial use.	2,428
23	83	Miscellaneous articles of base metal.	2,079
24	94	Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; lamps and lighting fittings, not elsewhere specified or included; illuminated signs, illuminated name-plates and the like; prefabricated buildings.	1,874
25	69	Ceramic products.	1,834
74	04	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included	0
75	18	Cocoa and cocoa preparations	0
76	01	Live animals	0
77	02	Meat and edible meat offal	0
78	05	Products of animal origin, not elsewhere specified or included	0
79	10	Cereals	0
80	14	Vegetable plaiting materials; vegetable products not elsewhere specified or included	0
81	26	Ores, slag and ash.	0
82	31	Fertilizers.	0
83	45	Cork and articles of cork	0
84	47	Pulp of wood or of other fibrous cellulosic material; waste and scrap of paper or paperboard.	0
85	50	Silk	0
86	75	Nickel and articles thereof	0
87	78	Lead and articles thereof.	0
88	79	Zinc and articles thereof.	0
89	80	Tin and articles thereof.	0
90	81	Other base metals; cermets: articles thereof.	0
91	86	Railway or tramway locomotives, rolling-stock and parts thereof; railway or tramway track fixtures and fittings and parts thereof; mechanical (including electro-mechanical) traffic signalling equipment of all kinds.	0
92	88	Aircraft, spacecraft and parts thereof.	0
93	89	Ships, boats and floating structures.	0
94	91	Clocks and watches and parts thereof.	0
95	92	Musical instruments; parts and accessories of such articles.	0
96	93	Arms and ammunition; parts and accessories thereof.	0
97	97	Works of art, collectors' pieces and antiques.	0
98	99	Other unclassified goods.	0

Source: own calculations

Great differences are recorded for commodity ranking of electrical machinery (row 4), and machinery (row 10), which have increased their trade creation relative to what is indicated in Table 13. This is due to the considerably higher import price elasticity, i.e. 1.56 compared to 0.113 (see row 17 of Table 12). It can, thus, be concluded that the choice of the import price elasticity has, at least, some impact on the selection of the commodities on which trade negotiators should focus.

It should be noted that we assumed that the initial tariff would be maintained throughout the period of implementation of the hypothetical FTA, which can be considered as the next five years. However, over this period the tariff structure in South Africa will change as part of WTO commitments. In principal, this will have a negative impact on trade creation, as the initial tariff will come down. What is needed is a schedule of applied MFN tariffs at the detailed HS8 level for the next five years.

We continue below with a report on the trade diversion calculations. In Table 15 we report on the estimated trade diversion using an elasticity that assumes a substitution between similar products originating from different suppliers of unity. It can easily be seen that the ranking of HS2 product groups is very similar to that of the trade creation calculations, notably those with the uniform import price elasticity shown in Table 14. In fact, all top ten HS2 commodities appear in both the trade creation and trade diversion ranking. The same applies to the bottom ten HS2 commodities.

The usefulness of a comparison of trade creation and trade diversion at the aggregate and at the commodity levels remains to be seen. With a uniform, albeit arbitrarily chosen, import price elasticity of 1.56 and a uniform elasticity of substitution of 1, it would appear that total trade diversion outweighs total trade creation by about 10%. All commodities with high trade diversion outweigh trade creation, while the raw hides, skins and leather (see row 18) is the only commodity group for which trade creation (not shown in Table 14) is larger than trade diversion.

Table 15: Potential trade diversion in South Africa following a FTA with India using a uniform substitution elasticities of 1.5 (R '000, 2000)

	HS2 code	HS2 descriptions	Trade diversion
			141,310
1	62	Articles of apparel and clothing accessories, not knitted or crocheted	42,928
2	64	Footwear, gaiters and the like; parts of such articles	17,607
3	63	Other made up textile articles; sets; worn clothing and worn textile articles; rags	14,598
4	85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers…	12,028
5	52	Cotton	10,001
6	55	Man-made staple fibres.	8,633
7	61	Articles of apparel and clothing accessories, knitted or crocheted	8,438
8	98	Special classifications provisions	8,364
9	73	Articles of iron or steel.	7,632
10	84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof.	7,272
11	42	Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (excluding silk-worm gut)	5,939
12	87	Vehicles (excluding railway or tramway rolling-stock) and parts and accessories thereof.	5,259
13	39	Plastics and articles thereof.	5,240
14	57	Carpets and other textile floor coverings.	5,063
15	82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal.	4,347
16	38	Miscellaneous chemical products.	4,273
17	40	Rubber and articles thereof.	3,980
18	41	Raw hides and skins (excluding furskins) and leather	3,690
19	54	Man-made filaments	3,496
20	72	Iron and steel.	2,533
21	59	Impregnated, coated, covered or laminated textile fabrics; textile articles of a kind suitable for industrial use.	2,283
22	09	Coffee, tea, mate and spices	2,194
23	83	Miscellaneous articles of base metal.	1,915
24	94	Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; lamps and lighting fittings, not elsewhere spec…	1,784
25	69	Ceramic products.	1,753
74	04	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included	0
75	18	Cocoa and cocoa preparations	0
76	01	Live animals	0
77	02	Meat and edible meat offal	0
78	05	Products of animal origin, not elsewhere specified or included	0
79	10	Cereals	0
80	14	Vegetable plaiting materials; vegetable products not elsewhere specified or included	0
81	26	Ores, slag and ash.	0
82	31	Fertilizers.	0
83	45	Cork and articles of cork	0
84	47	Pulp of wood or of other fibrous cellulosic material; waste and scrap of paper or paperboard.	0
85	50	Silk	0
86	75	Nickel and articles thereof	0
87	78	Lead and articles thereof.	0
88	79	Zinc and articles thereof.	0
89	80	Tin and articles thereof.	0
90	81	Other base metals; cermets: articles thereof.	0
91	86	Railway or tramway locomotives, rolling-stock and parts thereof; railway or tramway track fixtures and fittings and parts thereof; mechanica…	0
92	88	Aircraft, spacecraft and parts thereof.	0
93	89	Ships, boats and floating structures.	0
94	91	Clocks and watches and parts thereof.	0
95	92	Musical instruments; parts and accessories of such articles.	0
96	93	Arms and ammunition; parts and accessories thereof.	0
97	97	Works of art, collectors' pieces and antiques.	0
98	99	Other unclassified goods.	0

Source: own calculations

Indian imports

The next question is: Which HS2 commodities are expected to be of interest to Indian trade policy-makers when considering a FTA with South Africa? Since we employ UNCTAD's TRAINS database, the results are expressed in US$. It also appears that a considerably lower number of commodities are imported from South Africa by India.

Table 16: Potential trade creation in India following a FTA with India using a uniform import price elasticities of 1.5 (US$ '000, 1998)

	HS2 code	HS2 Descriptions	Trade creation
			133,545
1	71	Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal, and articles thereof; imitat…	53,659
2	28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes.	24,055
3	72	Iron and steel.	20,829
4	29	Organic chemicals.	4,730
5	27	Mineral fuels, oils and products of their distillation; bituminous substances; mineral waxes.	4,413
6	84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof.	3,829
7	82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal.	3,036
8	74	Copper and articles thereof	2,690
9	51	Wool, fine or coarse animal hair; horsehair yarn and woven fabric	2,356
10	76	Aluminium and articles thereof	1,873
11	39	Plastics and articles thereof.	1,752
12	87	Vehicles (excluding railway or tramway rolling-stock) and parts and accessories thereof.	1,719
13	85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers,…	1,166
14	90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus: parts and accessories…	1,017
15	54	Man-made filaments	721
16	08	Edible fruit and nuts; peel of citrus fruit or melons	702
17	25	Salt, sulphur, earths and stone, plastering materials, lime and cement.	618
18	47	Pulp of wood or of other fibrous cellulosic material; waste and scrap of paper or paperboard.	553
19	48	Paper and paperboard; articles of paper pulp, of paper or of paperboard	488
20	55	Man-made staple fibres.	424
21	75	Nickel and articles thereof	418
22	38	Miscellaneous chemical products.	334
23	44	Wood and articles of wood; wood charcoal	278
24	26	Ores, slag and ash.	259
25	73	Articles of iron or steel.	257
32	32	Tanning or dyeing extracts, tannins and their derivatives; dyes, pigments and other colouring matter; paints and varnishes; putty and other …	71
33	30	Pharmaceutical products.	67
34	22	Beverages, spirits and vinegar.	64
35	37	Photographic or cinematographic goods.	53
36	59	Impregnated, coated, covered or laminated textile fabrics; textile articles of a kind suitable for industrial use.	48
37	34	Soap, organic surface-active agents, washing preparations, lubricating preparations, artificial waxes, prepared waxes, polishing or scouring…	31
38	83	Miscellaneous articles of base metal.	25
39	68	Articles of stone, plaster, cement, asbestos, mica or similar materials	16
40	15	Animal or vegetable fats and oils and their cleavage products; edible fats; animal or vegetable waxes	15
41	18	Cocoa and cocoa preparations	10
42	49	Printed books, newspapers, pictures and other products of the printing industry; manuscripts, typescripts and plans	10
43	58	Special woven fabrics; tufted textile fabrics; lace tapestries; trimmings; embroidery.	9
44	33	Essential oils and resinoids; perfumery, cosmetic or toilet preparations.	9
45	52	Cotton	9
46	42	Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (excluding silk-worm gut)	8
47	96	Miscellaneous manufactured articles.	7
48	53	Other vegetable textile fibres; paper yarn and woven fabrics of paper yarn.	6
49	57	Carpets and other textile floor coverings.	6
50	91	Clocks and watches and parts thereof.	6
51	41	Raw hides and skins (excluding furskins) and leather	6
52	93	Arms and ammunition; parts and accessories thereof.	4
53	50	Silk	3
54	05	Products of animal origin, not elsewhere specified or included	2
55	64	Footwear, gaiters and the like; parts of such articles	0
56	31	Fertilizers.	0

Source: own calculations

We only present results of the trade creation model for uniform import price elasticity. The table above assumes an import price elasticity of 1. The commodity groups that will be of specific interest to Indian trade negotiators are found at the top of the table. Attention will focus in particular on precious stones and metals for jewellery, coal, iron and steel, basic chemicals, machinery and some non-metallic minerals such as cement. The high levels of trade creation for coal are interesting in that the tariff is relatively low, as was shown in Table 11 above, and it appears that the high value of the imports makes this product group still notable. In general, the product groups that featured in Tables 8 and 9, where we showed trade flows and tariffs, are also prominent in the trade creation rankings. The ranking of commodities according to the value of trade creation appears to be closely related to the value of imports and/or the tariff.

Table 17: Potential trade diversion in India on imports from South Africa following a FTA using a uniform substitution elasticities of 1.5 (US$ '000, 1998)

	HS2 Code	HS2 descriptions	Trade diversion
			86,326
1	71	Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal, and articles thereof; imitat…	35,087
2	28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes.	15,111
3	72	Iron and steel.	13,266
4	29	Organic chemicals.	3,129
5	27	Mineral fuels, oils and products of their distillation; bituminous substances; mineral waxes.	2,913
6	84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof.	2,544
7	82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal.	1,825
8	74	Copper and articles thereof	1,771
9	51	Wool, fine or coarse animal hair; horsehair yarn and woven fabric	1,520
10	76	Aluminium and articles thereof	1,204
11	39	Plastics and articles thereof.	1,160
12	87	Vehicles (excluding railway or tramway rolling-stock) and parts and accessories thereof.	1,135
13	85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers,…	776
14	90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus: parts and accessories…	674
15	54	Man-made filaments	469
16	08	Edible fruit and nuts; peel of citrus fruit or melons	466
17	25	Salt, sulphur, earths and stone, plastering materials, lime and cement.	400
18	47	Pulp of wood or of other fibrous cellulosic material; waste and scrap of paper or paperboard.	356
19	48	Paper and paperboard; articles of paper pulp, of paper or of paperboard	324
20	55	Man-made staple fibres.	280
21	75	Nickel and articles thereof	271
22	38	Miscellaneous chemical products.	222
23	44	Wood and articles of wood; wood charcoal	180
24	73	Articles of iron or steel.	171
25	26	Ores, slag and ash.	169
32	32	Tanning or dyeing extracts, tannins and their derivatives; dyes, pigments and other colouring matter; paints and varnishes; putty and other …	47
33	30	Pharmaceutical products.	45
34	22	Beverages, spirits and vinegar.	42
35	37	Photographic or cinematographic goods.	36
36	59	Impregnated, coated, covered or laminated textile fabrics; textile articles of a kind suitable for industrial use.	32
37	34	Soap, organic surface-active agents, washing preparations, lubricating preparations, artificial waxes, prepared waxes, polishing or scouring…	21
38	83	Miscellaneous articles of base metal.	17
39	68	Articles of stone, plaster, cement, asbestos, mica or similar materials	11
40	15	Animal or vegetable fats and oils and their cleavage products; edible fats; animal or vegetable waxes	10
41	18	Cocoa and cocoa preparations	7
42	49	Printed books, newspapers, pictures and other products of the printing industry; manuscripts, typescripts and plans	7
43	58	Special woven fabrics; tufted textile fabrics; lace tapestries; trimmings; embroidery.	6
44	33	Essential oils and resinoids; perfumery, cosmetic or toilet preparations.	6
45	52	Cotton	6
46	42	Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (excluding silk-worm gut)	5
47	96	Miscellaneous manufactured articles.	5
48	53	Other vegetable textile fibres; paper yarn and woven fabrics of paper yarn.	4
49	57	Carpets and other textile floor coverings.	4
50	91	Clocks and watches and parts thereof.	4
51	41	Raw hides and skins (excluding furskins) and leather	4
52	93	Arms and ammunition; parts and accessories thereof.	3
53	50	Silk	2
54	05	Products of animal origin, not elsewhere specified or included	1
55	64	Footwear, gaiters and the like; parts of such articles	0
56	31	Fertilizers.	0

Source: own calculations

As is the case with the calculations for South Africa, following the hypothetical FTA, trade diversion in India is closely related to trade creation, with precious stones and metals for jewellery, coal, iron and steel, basic chemicals and machinery featuring prominently. Given the choice of the import price and substitutions elasticities – although rather arbitrary as both were assigned the value of unity – trade creation is slightly larger than trade diversion. The largest gains of trade creation over trade diversion are expected to be recorded for precious stones and metals, inorganic chemicals, and basic iron and steel.

3.4 Revealed comparative advantage and revealed trade barriers

Since trade creation effects are not relevant to products that are currently not traded, it may be useful to consider an application of the theory of revealed comparative advantage for the

identification of *de facto* barriers to trade. According to Jachia and Teljeur (1998), this information may prove valuable during the negotiations for any free trade agreement, as the main "offensive interest", i.e. important tariff lines that the negotiators should target as a valuable inclusion in the tariff phase-down schedule, need to be identified

The starting point of RTB is the concept of revealed comparative advantage, which suggests that a comparative advantage is "revealed" in a particular commodity if its share in the country's export basket is larger than the share of the commodity's world trade in total world trade. In other words, is the commodity more important to South Africa's export than to world trade?

This construction can be extended in order to evaluate RTB. With regard to Indian imports, the question is then: To what degree is a commodity's share of imports in the import basket from South Africa larger or smaller than the share of total imports of that commodity in India's total import basket (summed over all products)? In other words: Are the imports of a particular commodity from South Africa relatively more or less important compared to total Indian imports from all sources of that commodity? If the RTB ratio is less than 1 we may conclude that South Africa is exporting a commodity relatively more to the rest of the world than it is to India, possibly due to trade barriers in India (see Appendix 3 for details). We use UNComTrade data as published by Statistics Canada's World Trade Analyser system. Revealed comparative advantages for South Africa at the SITC2 level are shown in the next table.

Table 18: Reveal comparative advantage for South Africa for selected SITC2 commodities, 1998

	SITC2	Description	Total SACU Exports (US$ million)	RCA index
1.	32	Coal, coke and briquettes	1,462.13	18.23
2.	28	Metalliferous ores and metal scrap	1,302.41	7.95
3.	06	Sugar, sugar preparations and honey	363.37	6.01
4.	25	Pulp and waste paper	354.43	5.65
5.	52	Inorganic chemicals	602.86	5.32
6.	93	Special transactions and commod, not class.t	2,661.77	4.83
7.	94	Animals, live, zoo animals, dogs, cats etc.	6.38	4.62
8.	27	Crude fertilizers and crude materials (excl. coal)	187.35	3.80
9.	66	Non-metallic mineral manufactures, n.e.s.	1,460.23	3.75
10.	05	Vegetables and fruit	938.33	3.58
11.	21	Hides, skins and furskins, raw	69.58	3.18
12.	67	Iron and steel	1,447.25	2.73
13.	56	Fertilizers, manufactured	146.73	2.59
14.	82	Furniture and parts thereof	467.38	2.26
15.	26	Textile fibres (except wool tops) and their wastes	163.52	2.13
16.	11	Beverages	262.25	2.13
17.	62	Rubber manufactures, n.e.s.	310.70	1.95
18.	61	Leather, leather manuf., n.e.s. and dressed furskins	141.13	1.72
19.	24	Cork and wood	184.27	1.46
20.	03	Fish, crustaceans, molluscs, preparations thereof	252.64	1.43
21.	68	Non-ferrous metals	434.47	1.19
22.	59	Chemical materials and products, n.e.s.	264.24	1.14
23.	64	Paper, paperboard, artic. of paper, paper-pulp/board	390.37	1.10
24.	04	Cereals and cereal preparations	212.14	1.03
25.	12	Tobacco and tobacco manufactures	88.78	1.01
26.	29	Crude animal and vegetable materials, n.e.s.	67.89	1.00

Source: own calculations

It can be seen that South Africa's revealed comparative advantage remains with natural resource-based commodities or their immediate downstream products. In the next table, we present the results of the application of model of India's RTB with respect to South Africa's exports. It can be seen that the majority of the product lines show a RTB value that is lower than 1, which indicates that South Africa's exports are relatively undertraded in the Indian

market relative to imports from the rest of the world. However, the trade values involved are relatively modest.

Table 19: Revealed trade barriers for South African exports to India for selected SITC2 commodities, 1998

	SITC2	Description	Total SACU Exports (US$ million)	RTB index
1.	00	Live animals chiefly for food	6	0.00
2.	01	Meat and meat preparations	49	0.00
3.	03	Fish, crustaceans, molluscs, preparations thereof	253	0.00
4.	07	Coffee, tea, cocoa, spices, manufactures thereof	73	0.00
5.	08	Feeding stuff for animals, not incl. unmil. cereals	10	0.00
6.	12	Tobacco and tobacco manufactures	89	0.00
7.	34	Gas, natural and manufactured	7	0.00
8.	42	Fixed vegetable oils and fats	34	0.00
9.	81	Sanitary, plumbing, heating and lighting fixtures	19	0.00
10.	83	Travel goods, handbags and similar containers	12	0.00
11.	85	Footwear	15	0.00
12.	94	Animals, live, zoo animals, dogs, cats etc.	6	0.00
13.	95	Arms, of war and ammunition therefor	0	0.00
14.	93	Special transactions and commod., not class.t	2,662	0.00
15.	88	Photographic apparatus, optical goods, watches	26	0.00
16.	56	Fertilizers, manufactured	147	0.01
17.	66	Non-metallic mineral manufactures, n.e.s.	1,460	0.02
18.	43	Animal-vegetable oils-fats, processed, and waxes	9	0.03
19.	11	Beverages	262	0.03
20.	54	Medicinal and pharmaceutical products	90	0.04
21.	79	Other transport equipment	337	0.04
22.	24	Cork and wood	184	0.05
23.	06	Sugar, sugar preparations and honey	363	0.08
24.	74	General industrial machinery and equipment, and parts	390	0.09
25.	22	Oil seeds and oleaginous fruit	29	0.09
26.	29	Crude animal and vegetable materials, n.e.s.	68	0.10
27.	84	Articles of apparel and clothing accessories	155	0.10
28.	75	Office machines and automatic data processing equip.	137	0.10
29.	02	Dairy products and birds' eggs	60	0.11
30.	04	Cereals and cereal preparations	212	0.11
31.	76	Telecommunications and sound recording apparatus	210	0.11
32.	63	Cork and wood manufactures (excl. furniture)	82	0.12
33.	58	Artif. resins, plastic mat., cellulose esters/ethers	135	0.13
34.	73	Metalworking machinery	34	0.13
35.	59	Chemical materials and products, n.e.s.	264	0.15
36.	72	Machinery specialized for particular industries	651	0.15
37.	05	Vegetables and fruit	938	0.16
38.	61	Leather, leather manuf., n.e.s. and dressed furskins	141	0.16
39.	97	Gold, non-monetary	16	0.17
40.	71	Power generating machinery and equipment	198	0.22
41.	82	Furniture and parts thereof	467	0.25
42.	89	Miscellaneous manufactured articles, n.e.s.	237	0.26
43.	77	Electrical machinery, apparatus and appliances n.e.s.	312	0.31
44.	87	Professional, scientific and controlling instruments	122	0.34
45.	21	Hides, skins and furskins, raw	70	0.39
46.	23	Crude rubber (including synthetic and reclaimed)	19	0.42
47.	55	Essential oils and perfume mat.; toilet-cleansing mat	111	0.44
48.	53	Dyeing, tanning and colouring materials	90	0.52
49.	33	Petroleum, petroleum products and related materials	92	0.56
50.	09	Miscel. Edible products and preparations	47	0.60
51.	69	Manufactures of metal, n.e.s.	382	0.62
52.	62	Rubber manufactures, n.e.s.	311	0.65
53.	65	Textile yarn, fabrics, made-upart., related products	293	0.86
54.	27	Crude fertilizers and crude materials (excl. coal)	187	0.92
55.	28	Metalliferous ores and metal scrap	1,302	1.60
56.	26	Textile fibres (except wool tops) and their wastes	164	1.82
57.	78	Road vehicles (incl. air cushion vehicles)	1,150	2.01
58.	68	Non-ferrous metals	434	2.03
59.	51	Organic chemicals	361	2.45
60.	64	Paper, paperboard, artic. of paper, paper-pulp/board	390	2.91
61.	41	Animal oils and fats	1	3.17
62.	52	Inorganic chemicals	603	4.55
63.	67	Iron and steel	1,447	4.86
64.	25	Pulp and waste paper	354	10.54
65.	32	Coal, coke and briquettes	1,462	11.03

Source: own calculations

Moreover, it is shown that not all South African commodities that have relatively low access to the Indian market currently display high volumes of trade. South African policy-makers would probably want to note that coal, iron and steel, as well as non-ferrous metals, are the more traditional exports with relatively high imports (in terms of values) that are *not* undertraded in the Indian market. However, more interesting commodity groups are motor vehicles (row 57), which are also not undertraded. On the other hand, other transport equipment (row 21), as well as a range of machinery and electrical machinery product groups (see amongst others rows 34, 36 and 40) and a number of food product groups, export more to the rest of the world than to the Indian market. There may be some potential to focus the negotiations on these product groups.

Turning to India's exports, the main product groups in which the country has a revealed comparative advantage are non-metallic minerals, textiles, clothing and food products. Other manufactures such as machinery and electronics are less important.

Table 20: Revealed comparative advantage for India for selected SITC2 commodities, 1998

	SITC2	Description	Total Indian Exports (US$ million)	RCA index
1.	99	Unclassified	7,469.57	8.04
2.	66	Non-metallic mineral manufactures, n.e.s.	5,297.65	6.78
3.	07	Coffee, tea, cocoa, spices, manufactures thereof	1,179.96	4.57
4.	08	Feeding stuff for animals, not incl. unmil. cereals	653.82	4.21
5.	65	Textile yarn, fabrics, made-upart., related products	4,953.42	4.16
6.	61	Leather, leather manuf., n.e.s. and dressed furskins	683.34	4.15
7.	29	Crude animal and vegetable materials, n.e.s.	525.04	3.84
8.	27	Crude fertilizers and crude materials (excl. coal)	347.97	3.51
9.	83	Travel goods, handbags and similar containers	379.79	3.45
10.	84	Articles of apparel and clothing accessories	4,826.45	3.41
11.	28	Metalliferous ores and metal scrap	993.82	3.02
12.	03	Fish, crustaceans, molluscs, preparations thereof	1,045.40	2.94
13.	53	Dyeing, tanning and colouring materials	463.33	2.11
14.	22	Oil seeds and oleaginous fruit	198.25	1.73
15.	51	Organic chemicals	1,346.62	1.61
16.	04	Cereals and cereal preparations	561.69	1.36
17.	05	Vegetables and fruit	695.77	1.32
18.	42	Fixed vegetable oils and fats	186.99	1.19
19.	81	Sanitary, plumbing, heating and lighting fixtures	160.71	1.16
20.	85	Footwear	343.05	1.12
21.	69	Manufactures of metal, n.e.s.	878.14	1.05
22.	12	Tobacco and tobacco manufactures	175.48	0.99
23.	67	Iron and steel	1,017.61	0.96
24.	26	Textile fibres (except wool tops) and their wastes	131.64	0.85
25.	43	Animal-vegetable oils-fats, processed, and waxes	19.62	0.73

Source: own calculations

The degree to which India's exports are represented in the South African market can be examined in the next table. It can be seen that Indian exports of a large number of SITC2 product groups are underrepresented in the South African market.

Table 21: Revealed trade barriers for Indian exports to South Africa, 1998

	SITC2	Description	Total Indian Exports (US$ million)	RTB index
1.	00	Live animals chiefly for food	7	0.00
2.	01	Meat and meat preparations	96	0.00
3.	02	Dairy products and birds' eggs	12	0.00
4.	21	Hides, skins and furskins, raw	1	0.00
5.	25	Pulp and waste paper	1	0.00
6.	32	Coal, coke and briquettes	8	0.00
7.	34	Gas, natural and manufactured	2	0.00
8.	41	Animal oils and fats	0	0.00
9.	56	Fertilizers, manufactured	11	0.00
10.	94	Animals, live, zoo animals, dogs, cats etc.	0	0.00
11.	95	Arms, of war and ammunition therefor	3	0.00
12.	97	Gold, non-monetary	20	0.00
13.	79	Other transport equipment	55	0.00
14.	33	Petroleum, petroleum products and related materials	161	0.00
15.	12	Tobacco and tobacco manufactures	175	0.00
16.	76	Telecommunications and sound recording apparatus	128	0.02
17.	75	Office machines and automatic data processing equip.	145	0.03
18.	28	Metalliferous ores and metal scrap	994	0.07
19.	26	Textile fibres (except wool tops) and their wastes	132	0.07
20.	24	Cork and wood	8	0.09
21.	64	Paper, paperboard, artic. of paper, paper-pulp/board	53	0.09
22.	23	Crude rubber (including synthetic and reclaimed)	10	0.10
23.	78	Road vehicles (incl. air cushion vehicles	533	0.16
24.	11	Beverages	5	0.16
25.	06	Sugar, sugar preparations and honey	40	0.20
26.	43	Animal-vegetable oils-fats, processed, and waxes	20	0.22
27.	71	Power generating machinery and equipment	321	0.22
28.	74	General industrial machinery and equipment, and parts	360	0.24
29.	88	Photographic apparatus, optical goods, watches	38	0.27
30.	63	Cork and wood manufactures (excl. furniture)	65	0.30
31.	73	Metalworking machinery	44	0.30
32.	68	Non-ferrous metals	150	0.34
33.	09	Miscel. edible products and preparations	39	0.37
34.	72	Machinery specialized for particular industries	255	0.42
35.	87	Professional, scientific and controlling instruments	124	0.45
36.	55	Essential oils and perfume mat.; toilet-cleansing mat	163	0.49
37.	42	Fixed vegetable oils and fats	187	0.51
38.	58	Artif. resins, plastic mat., cellulose esters/ethers	252	0.63
39.	27	Crude fertilizers and crude materials (excl. coal)	348	0.70
40.	59	Chemical materials and products, n.e.s.	134	0.74
41.	77	Electrical machinery, apparatus and appliances n.e.s.	612	0.76
42.	93	Special transactions and commod., not class.t	122	0.77
43.	03	Fish, crustaceans, molluscs, preparations thereof	1,045	0.90
44.	82	Furniture and parts thereof	149	1.01
45.	89	Miscellaneous manufactured articles, n.e.s.	1,205	1.03
46.	52	Inorganic chemicals	106	1.13
47.	54	Medicinal and pharmaceutical products	483	1.21
48.	83	Travel goods, handbags and similar containers	380	1.26
49.	66	Non-metallic mineral manufactures, n.e.s.	5,298	1.28
50.	67	Iron and steel	1,018	1.33
51.	51	Organic chemicals	1,347	1.39
52.	05	Vegetables and fruit	696	1.57
53.	62	Rubber manufactures, n.e.s.	226	1.72
54.	81	Sanitary, plumbing, heating and lighting fixtures	161	1.75
55.	53	Dyeing, tanning and colouring materials	463	2.33
56.	69	Manufactures of metal, n.e.s.	878	2.36
57.	22	Oil seeds and oleaginous fruit	198	3.32
58.	08	Feeding stuff for animals, not incl. unmil. cereals	654	3.47
59.	85	Footwear	343	3.64
60.	65	Textile yarn, fabrics, made-upart., related products	4,953	4.92
61.	07	Coffee, tea, cocoa, spices, manufactures thereof	1,180	5.02
62.	84	Articles of apparel and clothing accessories	4,826	6.33
63.	04	Cereals and cereal preparations	562	9.61
64.	29	Crude animal and vegetable materials, n.e.s.	525	11.34
65.	61	Leather, leather manuf., n.e.s. and dressed furskins	683	15.89

Source: own calculations

However, their total export values are relatively modest. The exceptions are metalliferous ores and metal scrap (row 18) and motor vehicles (row 23), some of the electrical machinery commodities (see row 41), and prepared fish (see row 43).

4 CONCLUSIONS

In terms of trade flows, South African imports from India are concentrated in textiles & clothing, vegetable products and raw hides and leather, while exports to India are more diversified with contributions made by mineral products, chemicals, base metals, textiles and pulp and paper. The tariff structure on South Africa imports from India shows an estimated import weighted average (book) rate of about 12%. Particularly high rates are imposed on textiles & clothing and footwear and wood products with 27%, 24% and 18% unweighted average tariffs respectively. All other groups of commodities, at least at the 22 Chapter level, are treated with an average rate of about 10% or less. On the other side of the bilateral trade flows, South African exports to India are faced with an average tariffs of 24%. Of particular concern to South African trade negotiators are broad commodities such as motor vehicles and machinery, for which duties of 40% on average apply. In addition, considerable intraindustry trade relative to South Africa's total exports were shown to apply to a range of relatively narrow defined HS4 level commodity groups, amongst others, groups associated with motor vehicles.

From the point of view of trade creation/diversion, South Africa should focus on the textiles, clothing, leather, and electrical machinery commodities. It is in these product groups that imports from India are expected to make some inroads. Also, with zero tariffs on Indian imports, these commodities will be subject to considerable trade diversion. In other words, imports of these commodities, which are currently sourced from other countries, will be replaced by imports from India. Commodities such as food products, metals products and heavy machinery require less attention as far as trade creation and trade diversion in South Africa are concerned. From India's point of view, a potential FTA with South Africa could raise concerns of trade creation and trade diversion for precious metals for jewellery, coal, iron and steel, basic chemicals, machinery and some non-metallic minerals such as cement.

The RTB analysis shows that Indian exports of textiles and clothing as well as footwear and wood products are overtraded in the South African market, i.e., South African imports of these groups of commodities are sourced relatively more from India than other countries. This suggests that there is no RTB for these commodity groups. On the other hand, a large range of Indian commodities with small trade volumes are relatively undertraded in the South African, which suggests that the same applies to South African exports to India. Commodities with large trade volumes are over-represented in the Indian market, compared to the average basket of Indian imports, including coal, iron and steel, pulp and paper and motor vehicles. Interestingly, for iron and steel and vehicles, this occurs in spite of relatively high trade barriers.

REFERENCES

Gumede, V. 2000: *Import Performance And Import Demand Functions For South Africa*, TIPS Working Paper no 9.

Jachia, L and Teljeur E. 1998: *Free Trade with Europe – the Winners and Losers, Results of the SMART Simulation*, TIPS Working Paper no 11, July.

Tsikata, YM. 1999: *Southern Africa: Trade, Liberalization and Implications for a Free Trade Area*, Paper presented at the 1999 TIPS Forum.

van Seventer, DEN. 2001: *Note on Tariff Schedule, Apr 2001*, Draft prepared for TIPS Trade Policy Review Workshop, Johannesburg, May 2001.

APPENDIX 1: TRADE INTENSITY INDEX METHODOLOGY

The trade intensity index is an index of intensity of India's (South Africa's) export trade with South Africa (India) relative to its exports to the rest of the world and can be defined as:

$$(A.1.1) \qquad m_{ij} = \left[\frac{M_{ij}}{M_i}\right] \Big/ \left[\frac{X_j}{(X_w - X_i)}\right]$$

where

M_{ij}	=	South African imports from India
M_i	=	total imports of South Africa
X_w	=	total world exports (trade)
X_i, X_j	=	total South African export and total export of India respectively

The index of intensity of India's import trade with South Africa is defined as:

$$(A.1.2) \qquad x_{ij} = \left[\frac{X_{ij}}{X_i}\right] \Big/ \left[\frac{M_i}{(X_w - M_j)}\right]$$

where

X_{ij}	=	South African exports to India
X_w	=	total world imports (trade)
M_j	=	total imports of India

APPENDIX 2: TRADE CREATION AND TRADE DIVERSION METHODOLOGY

The methodology employed here is comparatively simple, without onerous data requirements, which can be used to evaluate the impact of changing tariff levels on trade patterns at a disaggregated commodity level. Following a hypothetical free trade arrangement between South Africa and India, the following changes in trade flows between the two countries and third countries can amongst others be distinguished:

❑ Trade creation (TC), which measures the increase in imports from India due to a decrease in the relative price of these imports vis-à-vis domestically produced goods, resulting in a net increase in South Africa's total imports and a net decrease in South Africa's domestic production; and

❑ Trade diversion (TD), which measures the increase in South Africa imports from India due to a decrease in the relative price of these imports vis-à-vis imports from other countries resulting in a different geographical composition of imports, whereby imports from India increase at the expense of imports from other sources, with no change in total South African imports.

Trade creation is considered to be welfare enhancing since relatively high-costs domestic production is replaced with lower-cost imports from India. Nevertheless South Africa has to face the decline of local, albeit less efficient, production. Trade diversion is considered to be welfare lowering in that South Africa switches its source of imports from a more efficiently producing country to a less efficiently producing country, leading to a less efficient allocation of resources, although the total import bill remains unchanged.

A2.1 Trade Creation

Trade creation follows directly from the formulation of the import price elasticity:

(A2.1a) $$Em_j = \frac{\Delta M_j / M_j}{\Delta P_j / P_j}$$

in which Em_j is the percentage change in the demand for imports of good j ($\Delta Mj / Mj$) when the price of the imports (P_j) on the domestic market increases by 1% ($\Delta Pj / Pj$), Mj is the current value of imports of good j and ΔMj its change, i.e., the trade creation. Equation (A2.1a) can be rewritten as:

(A2.1b) $$TC_j = \Delta M_j = Em_j * M_j * \frac{\Delta P_j}{P_j}$$

If $T_{j,0}$ and $T_{j,1}$, are the tariff of good j before and after the free trade agreement comes in effect respectively we can define the relative price increase as:

(A3.1c) $$\frac{\Delta P_j}{P_j} = \frac{\left(1 + T_{1,j}\right) - \left(1 + T_{0,j}\right)}{\left(1 + T_{0,j}\right)}$$

If we assume that $T_{1,j} = 0$, i.e., the new tariff under the free trade area is set to zero, then, eqn (2.1c) changes into:

(A2.1d)
$$TC_j = Em_j * M_j * \frac{-T_{0,j}}{\left(1 + T_{0,j}\right)}$$

A number of issues remain unresolved in this formulation. Firstly, are products from India and the rest of the world perfect substitutes? If so, one is assuming that elasticity of import demands are equivalent. Secondly, the problem is that if this is the case then we would see zero imports from India initially as all imports of the product would be sourced from the cheapest country somewhere else in the rest of the world.

A2.2 Trade Diversion

Continuing with trade diversion, this is a more complicated matter in that it involves the imports from sources other than India. As a starting point, it is useful to first consider the change in price of imports from India relative to that of other sources. This relative price change follows a preferential liberalisation (such as a South Africa – India Free Trade Area), which brings the tariffs on imports from India down to zero whilst retaining an unchanged positive tariff on imports from other sources. The relative price change between imports from India and other sources can be written as follows:

(A2.2a)
$$\frac{\Delta\left(\frac{P_j^{India}}{P_j^{RoW}}\right)}{\left(\frac{P_j^{India}}{P_j^{RoW}}\right)} = \frac{\frac{\left(1 + T_{1,j}^{India}\right)}{\left(1 + T_{1,j}^{RoW}\right)}}{\frac{\left(1 + T_{0,j}^{India}\right)}{\left(1 + T_{0,j}^{RoW}\right)}} - 1$$

This formulation can be simplified by assuming no change in the tariffs applicable to imports from other sources, i.e.:

(A2.2b)
$$T_{1,j}^{RoW} = T_{0,j}^{RoW}$$

Moreover, as before we assume full liberalisation in which the tariff after the free trade arrangement is set to zero,

(A2.2c)
$$T_{1,j}^{India} = 0$$

Substituting eqn (2.2b) and (2.2c) into eqn (2.2a) yields:

(A2.2d)
$$\frac{\Delta\left(\frac{P_j^{India}}{P_j^{RoW}}\right)}{\left(\frac{P_j^{India}}{P_j^{RoW}}\right)} = \frac{T_{o,j}^{India}}{\left(1 + T_{o,j}^{India}\right)}$$

Trade diversion follows from the formulation of the elasticity of substitution. The elasticity of substitution tells us how import demand will shift from the rest of the world (RoW) to India as the price of Indian imports changes relative to RoW imports.

$$(A2.2e) \qquad Es_j = \frac{\Delta\left(\dfrac{M_j^{India}}{M_j^{RoW}}\right) \bigg/ \left(\dfrac{M_j^{India}}{M_j^{RoW}}\right)}{\Delta\left(\dfrac{P_j^{India}}{P_j^{RoW}}\right) \bigg/ \left(\dfrac{P_j^{India}}{P_j^{RoW}}\right)}$$

For example if $Es_j = -3$, then a 1 % fall in the relative price of Indian imports would result in a 3 % increase in the relative demand for Indian imports. We generally ignore the negative sign of Es., i,e redefine elasticity to be $-Es$. For purposes of calculating trade diversion we want to find ΔM_j^{India}. Similar to the trade creation formulation, we can rewrite the elasticity of substitution as follows

$$(A2.2f) \qquad \Delta\left(\frac{M_j^{India}}{M_j^{RoW}}\right) = Es_j * \frac{\Delta\left(\dfrac{P_j^{India}}{P_j^{RoW}}\right)}{\left(\dfrac{P_j^{India}}{P_j^{RoW}}\right)} * \left(\frac{M_j^{India}}{M_j^{RoW}}\right)$$

Applying the quotient rule of differentiation to the left hand side of (A2.2f) we can proceed with:

$$(A2.2g) \qquad \Delta\left(\frac{M_j^{India}}{M_j^{RoW}}\right) = \frac{\left(M_j^{RoW} * \Delta M_j^{India} - M_j^{India} * \Delta M_j^{RoW}\right)}{M_j^{RoW2}}$$

If net trade is assumed not to be effected, i.e.:

$$(A2.2h) \qquad \Delta M_j^{India} = -\Delta M_j^{RoW}$$

substituting eqn (A2.2h) and (A2.2g) into (A2.2f) results in:

$$(A2.2i) \qquad TD_j = \Delta M_j^{India} = Es_j * \frac{\Delta\left(\dfrac{P_j^{India}}{P_j^{RoW}}\right)}{\left(\dfrac{P_j^{India}}{P_j^{RoW}}\right)} * \frac{\left(M_j^{India} * M_j^{RoW}\right)}{\left(M_j^{India} + M_j^{RoW}\right)}$$

Finally, given our formulation of relative price changes in (A2.2d) we can rewrite (A2.2i) as follows:

$$(A2.2j) \qquad TD_j = \Delta M_j^{India} = \frac{M_j^{India} * M_j^{RoW} * \left[\dfrac{T_{o,j}^{India}}{\left(1 + T_{o,j}^{India}\right)}\right] * Es}{M_j^{India} + M_j^{RoW}}$$

Note that the UNCTAD formulation, reported by Jachia and Teljeur (1998) adds an additional term to the denominator that is equal to:

$$M_j^{India}\left[\frac{T_{o,j}^{India}}{\left(1+T_{o,j}^{India}\right)}\right] * Es$$

While Tsikata (1999: 42) employs the following formulation to calculate trade diversion

(A2.3) $\qquad TD_j = TC_j * Es$

Clearly, with an elasticity of substitution of unity, the amount of trade diversion is equal to trade creation. In order to evaluate the impact of the FTA, it is useful to analyse the import and export sides separately. The formulation for the export side is analogue to eqns (2.1) and (2.2) above except that the symbol *M* refers to Indian imports and the superscript India changes to South Africa indicating South African exports to India.

APPENDIX 3: REVEALED TRADE BARRIER METHODOLOGY

The starting point of revealed trade barriers is the theory of revealed comparative advantage. This theory suggests that a country's exports shows a revealed comparative advantage in a particular commodity if its share in the country's export basket is larger than the share of the commodity's world trade in total world trade. In other words: Is the commodity more important to South Africa's export than to world trade? Formally:

$$A3.1 \qquad RCA_{ik} = \frac{X_{ik}}{\sum_k X_{ik}} \bigg/ \frac{\sum_i X_{ik}}{\sum_i \sum_k X_{ik}}$$

in which X_{ik} is export of country i in product k.

This construction can be extended in order to evaluate revealed trade barriers (RTB). With regard to Indian imports, the question is then: To what degree is a commodity's share of imports in the import basket from South Africa larger or smaller than the share of total imports of that commodity in India's total import basket (summed over all products)? In other words: Are the imports of a particular commodity from South Africa relatively more or less important compared to total Indian imports from all sources of that commodity? Formally:

$$A3.2 \qquad RTB_{ik}^{j} = \frac{M_{ik}^{j}}{\sum_k M_{ik}^{j}} \bigg/ \frac{\sum_i M_{ik}^{j}}{\sum_i \sum_k M_{ik}^{j}}$$

in which M_{ik}^{j} is country j's imports from country i of product k.

If the ratio is less than 1 we may conclude that South Africa is exporting a commodity relatively more to the rest of the world than it is to India, possibly due to trade barriers in India.