

Notes on Welfare Losses of Tariffs and Tariff Protection: A Partial Equilibrium Application to South African Data

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Prepared for the May 2001 TIPS Trade Policy Review Workshop

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INTRODUCTION

Almost immediately after the first democratic election, South African policy makers embraced the policy of trade liberalisation (see Holden 2000). To many observers, the offer made by South Africa to the World Trade Organisation (WTO) has been very generous. Various attempts to evaluate the impact of trade liberalisation on the South African economy have been undertaken since (see, for example, IDC 1997, Valodia 1998, and Lewis 2001). These attempts have either been of a general equilibrium nature or of a very micro firm level nature.

In this paper, we consider the partial equilibrium effects of trade liberalisation on selected South African sectors and clusters of commodities following Greenaway & Milner (1993). This methodology is somewhere in between the general equilibrium analysis and the firm level analysis, in that it can be conducted right the whole range of imported merchandise but also at a fine level of commodity detail (HS8).

We first present some basic theory on the welfare gains and losses of tariff changes, after which we attempt to operationalise the welfare gains and losses of changes in import tariffs. We conclude by presenting some indicative results based on (relatively old) IDC data for imports and associated tariffs. We also apply the methodology to more recent tariffs, which allows us to evaluate welfare gains and losses of tariff changes at a more detailed level of clusters of commodities.

THEORETICAL OVERVIEW

The application of a tariff on imported goods has a number of welfare implications on: consumers; government; international producers; the world; and domestic producers. The welfare impact depends on: how big the home country is; how responsive foreign export suppliers (reflected in the import demand curve) are; and how responsive domestic consumers are to changes in the price of the commodity.

Let us consider some illustrative examples to facilitate our intuitive understanding.

Case 1: US import tariff on cars

In the first case, we take a look at the imposition of a tariff by a large country, which by virtue of its size can influence the world price of a product. A hypothetical example is presented in Figure 1, which depicts the US's import demand and the rest of the world's export supply curve for cars. From the diagram, it is evident that the supply curve of cars to the US is very inelastic, i.e. steep. This is partly because the US is such a large purchaser of foreign cars (a monopsonistic buyer) that a reduction in US imports will cause a decline in international prices.

However, other factors such as technology also play a part. With free trade, the world price is P_w and M' cars are imported. If a tariff of P_0P' is imposed, domestic prices will rise and consumption (and therefore imports) will decline. In response to the declining imports, foreign prices fall to P' . Thus domestic prices do not rise the full tariff of P_0P' , but only a fraction P_0P_w . Foreign car producers suffer a reduction in price to P' . Therefore, they are partly 'paying' for the imposition of the tariff by means of reduced price.

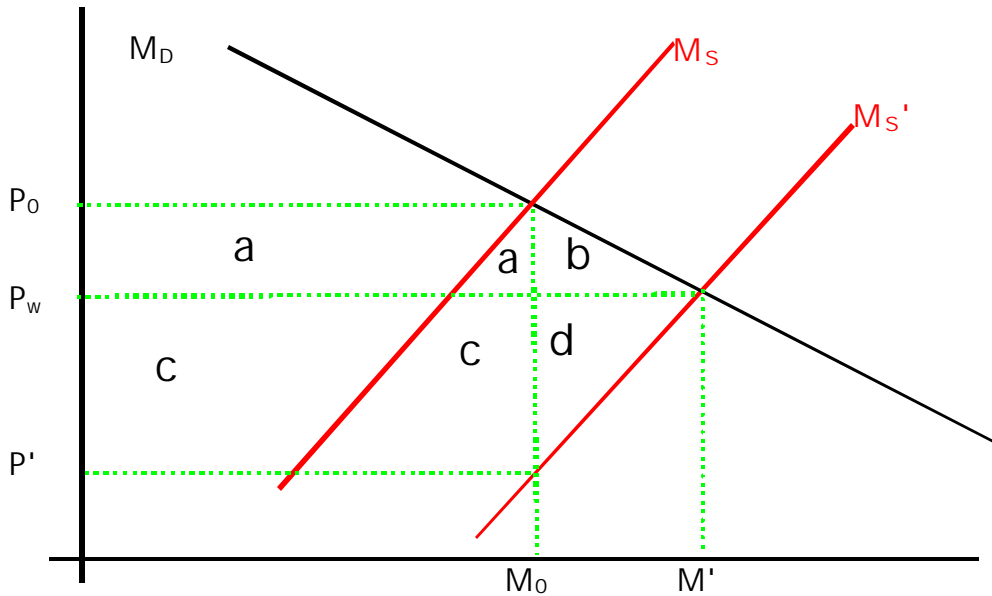
The following welfare changes occur:

1. US consumer welfare falls by $(a + b)$.
 - Initially, consumers purchased M' at a price of P_w . Now they import less, M_0 , at a higher price of P_0 . They are thus paying a (which reflects the money value of $(P_0 - P_w) * M_0$) more for the M_0 cars they used to import at old world price of P_w .
 - Consumers also lose b , which reflects the negative impact on the satisfaction they used to experience when purchasing $M_0 M'$ more cars at the lower price P_w . This “dead weight loss” can be valued at $(P_0 - P_w) * (M' - M_0) / 2$. If production output increases this area also includes the loss in resources used to produce additional cars at prices above that of the world price.
2. Foreign producer welfare falls by $(c + d)$, which reflects a decline in operating surplus.
 - They lose c revenue because instead of receiving P_w for the first M_0 -cars they exported to the US, they now only receive P' for each car, the total value of which is $(P_w - P') * M_0$.
 - They also lose revenue d , which reflects the operating revenue they received from selling the extra $M_0 M'$ cars at the original price P_w . This can be valued at $(P_w - P') * (M' - M_0) / 2$.¹
3. The US government gains $(a + c)$ in the form of tariff revenue. M_0 cars are imported and a tariff of $P_0 P'$ is imposed on each.
4. World gains = $(a + c) - (a + b) - (c + d) = -(b + d)$. The world loses $(b + d)$ as $M' M_0$ fewer cars are produced that used to bring welfare gains to both producers and consumers. Thus what may be good for the US is not good for the world.
5. Not shown here is the gain to local producers. Local producers gain as they are now able to raise their price to P_0 as well as sell more cars. This gain is, however, exactly offset by the loss in welfare by US consumers from having to pay a higher domestic price. In order to determine the size of this welfare transfer from consumers to local producers we would need to establish local demand and supply curves.

The net gain to the US is $(a + c) - (a + b) = (c - b)$. If $c > b$ then the US gains. They gain in this case because, by imposing the tariff, they force foreign car producers to reduce their prices in order to offset potential losses in export sales. The tariff thus lowers the terms of trade for foreigners and enables the US to import cars, albeit fewer, at a lower world price. Clearly, the government may have to utilise the revenue they gain in order to compensate the consumers if they are a strong lobby group. Also note that if foreign producers use tariffs to counter the imposition of tariffs in the US, then the latter may lose as well. Further losses may arise if companies use resources in order to lobby government to impose these strategic tariffs. The net gains are at best ambiguous.

¹ The export supply curve reflects the cost of producing each extra unit of cars for the export market. The difference between the price the producer receives and the supply curve is thus a measure of the operating surplus gained from selling the cars.

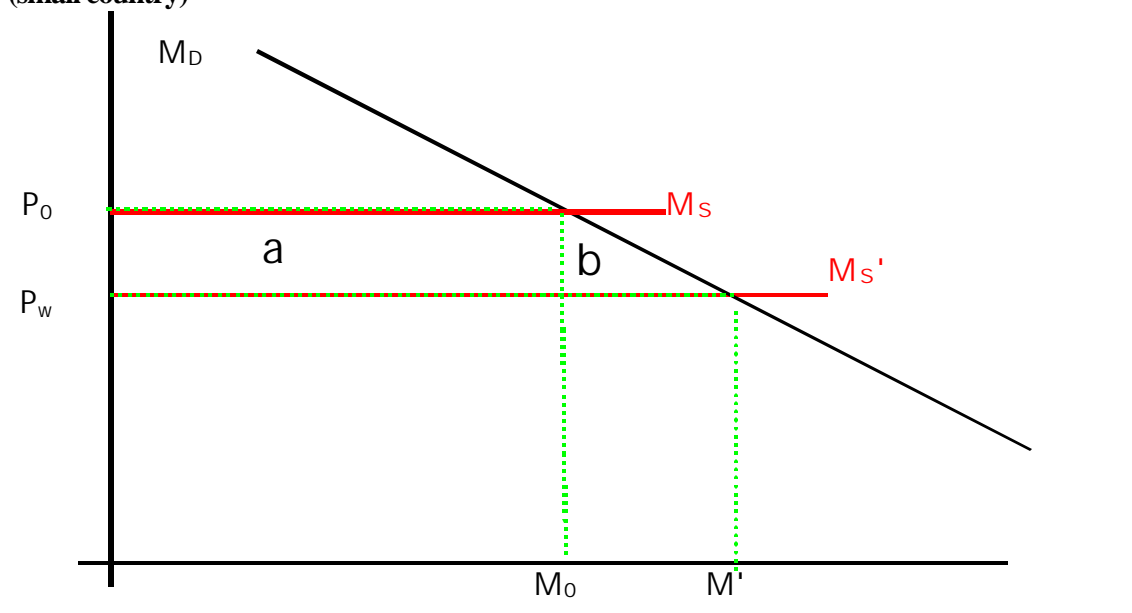
Figure 1: Gains and losses of a tariff increase with upward sloping import supply curve (large country)



Case 2: South African import tariff on cars

In the second case, we look at the example of South Africa, which is a small importer of international cars. If a tariff is imposed, the world price will not change because a decline in imports from South Africa is insignificant compared to total world sales of cars. The elasticity of export supply is thus infinite. As shown in Figure 2, a tariff of P_0P_w raises the price faced by domestic consumers and reduces total imports from M' to M_0 . South Africa consumers lose $(a + b)$ and government gains a in revenue, resulting in a net loss of b .

Figure 2: Gains and losses of a tariff increase with upward sloping import supply curve (small country)

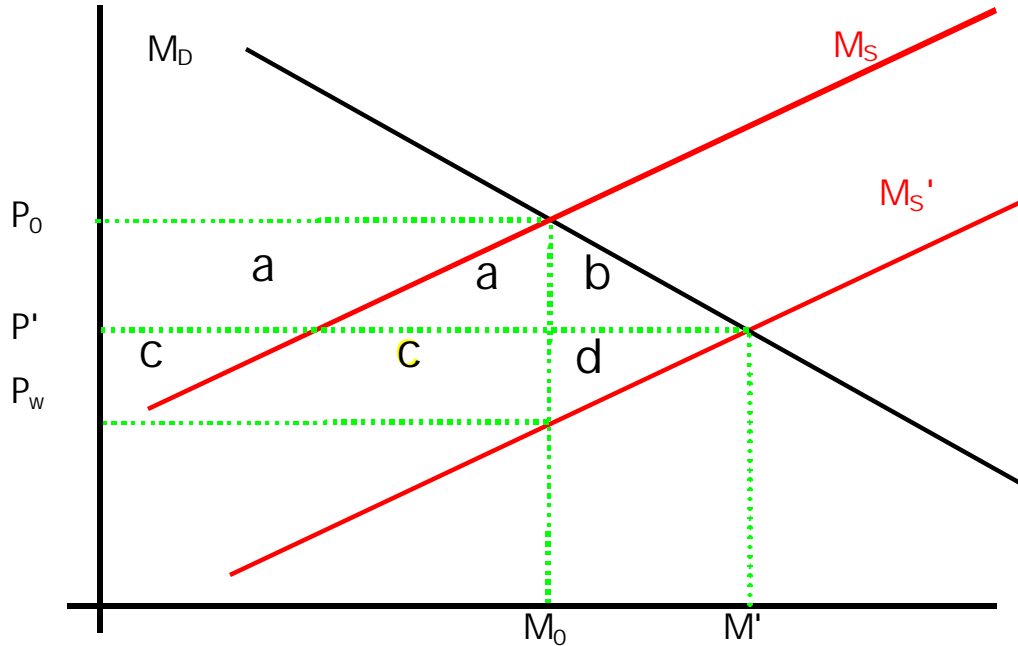


OPERATIONALISATION OF THE THEORY

As has shown in the two examples above, much of the welfare gains or losses arising from the imposition of a tariff depend on the elasticity of export supply. The more inelastic the export supply is, the greater the potential gains. In this section, we continue with an exposition of the application of the above theory to South African circumstances. For expositional purposes, we turn the situation around and consider the elimination of tariffs.

Suppose we have the following set-up for a given import: A downward sloping import demand curve M_D and, for reasons of convenience, an upward sloping import supply curve M_S . As South Africa imports less than 1 % of total world exports, it is unlikely to face upward sloping foreign export supply curves. Nevertheless, we use the upward sloping export supply curve as our starting point in order to create a generic template, in which we can change demand and supply elasticities to any level.

Figure 3: Gains and losses of a tariff reduction with upward sloping import supply curve (large country)



Looking at Figure 3, it can be seen that demand and supply of imports are in equilibrium at price P_0 and quantity M_0 . The equilibrium is reached given a tariff t such that

$$(1) \quad P_0 = P_w(1+t)$$

After the tariff is eliminated, imports will increase to M' at a new world price P' . As explained in the examples above, the new world price P' only differs from P_w if we have a positively sloped import supply curve (referred to as foreign export supply curve above). If we make the small country assumption, the import supply curve flattens out, the supply elasticity approaches infinity and P' will converge on P_w .

In order to determine the welfare losses and gains according to our earlier discussion, we require as inputs to our calculations an initial value for the current imports, M_0 , the tariff t , and some estimates for the import demand and import supply elasticities, \hat{a}_D and \hat{a}_S respectively. Elasticities, which tell us the responsiveness of demand and supply to price changes, can be easily converted into the slopes of the demand and supply curves according to the following relationships consistent with the notation of Figure 3 above.

$$(2a) \quad e_D = \frac{\Delta M_D / M_D}{\Delta P / P_0} = \frac{\Delta M_D}{\Delta P} \frac{P_0}{M_D} = \mathbf{a} \frac{P_0}{M_D} \Leftrightarrow \mathbf{a} = e_D \frac{M_D}{P_0} = e_D \frac{M_0}{P_w(1+t)} \quad (\text{Note } e_D < 0 \text{ and } e_S > 0)$$

$$(2b) \quad e_S = \frac{\Delta M_S / M_S}{\Delta P / P_w} = \frac{\Delta M_S}{\Delta P} \frac{P_w}{M_S} = \mathbf{b} \frac{P_w}{M_S} \Leftrightarrow \mathbf{b} = e_S \frac{M_S}{P_w} = e_S \frac{M_0}{P_w}$$

\hat{a} and \hat{a} are thus the slopes of the import demand and supply functions respectively. Given the co-ordinates of Figure 3, the slopes of the import demand and supply functions can be approximated as follows:

$$(3a) \quad \mathbf{a} = \frac{M' - M_0}{P' - P_0} \Leftrightarrow M' - M_0 = \mathbf{a}(P' - P_0) = \mathbf{a}[P' - P_w(1+t)]$$

$$(3b) \quad \mathbf{b} = \frac{M' - M_0}{P' - P_w} \Leftrightarrow M' - M_0 = \mathbf{b}(P' - P_w)$$

We can now solve for the new equilibrium price P'

$$(4) \quad \mathbf{a}[P' - P_w(1+t)] = \mathbf{b}(P' - P_w) \Leftrightarrow (\mathbf{a} - \mathbf{b})P' = \mathbf{a}P_w(1+t) - \mathbf{b}P_w$$

If we scale output such that $P_w = 1$, this reduces further to

$$(\mathbf{b} - \mathbf{a})P' = \mathbf{b} - [\mathbf{a}(1+t)] \Leftrightarrow P' = \frac{\mathbf{b} - \mathbf{a} - \mathbf{a}t}{\mathbf{b} - \mathbf{a}} \Leftrightarrow P' = 1 - \frac{\mathbf{a}t}{\mathbf{b} - \mathbf{a}}$$

It can now be seen that if \mathbf{b} approaches infinity, i.e., if the elasticity of import supply is very high as would be expected for a small economy like South Africa, P' approaches the P_w . Substituting the results of equation (4) into equation (3a) returns the equilibrium quantity of imports M'

$$(5) \quad M' = M_0 - (P_0 - P')\mathbf{a}$$

Utilising equations (1) – (5) we can now express areas a to d in terms of our known variables P_0, M_0, t, \hat{a}_D and \hat{a}_S .

From Figure 3 area a can be calculated as

$$(6) \quad a = (P_0 - P')M_0$$

Substituting equation (4) for P' we can write and simplify

$$a = \left[P_0 - \left(1 - \frac{at}{b-a} \right) \right] M_0 = \left[(1+t) - 1 + \frac{at}{b-a} \right] M_0 = \left[\frac{bt}{b-a} \right] M_0 = \left[\frac{e_s \frac{M_0}{P_w} t}{e_s \frac{M_0}{P_w} - e_D \frac{M_0}{P_w(1+t)}} \right] M_0 = \left[\frac{e_s t}{e_s - \frac{e_D}{(1+t)}} \right] M_0$$

Note that in the last step we substitute M_0 out and let $P_w = 1$. Moreover, in terms of known variables, we only know t , M_0 and the elasticities. We cannot see P_0 , but by assuming $P_w = 1$ we solve this problem. We have essentially re-scaled imports such that each unit is exactly equal to R1 at world prices. From Figure 3 area b can be calculated as

$$(7) \quad b = (P_0 - P')(M' - M_0)/2$$

Substituting equation (5) for M' we can write

$$b = -(P_0 - P')^2 a/2$$

In calculating a we showed that

$$P_0 - P' = \frac{e_s t}{e_s - e_D/(1+t)}$$

Letting $P_w = 1$ and substituting $P_0 - P'$ and equation (2a), b can be written as

$$b = \frac{1}{2} e_D \frac{M_0}{(1+t)} \left[\frac{e_s t}{e_s - e_D/(1+t)} \right]^2$$

From the above equation we can see that the dead weight loss b to consumers is proportional to the square of the tariff rate. The losses arising from the imposition of a tariff, thus increase at an exponential rate.

Turning now to c , this area in Figure 3 can be calculated as

$$(8) \quad c = (P' - P_w) M_0$$

By again letting $P_w = 1$ and substituting equation (4) for P' we can write:

$$c = - \frac{e_D \frac{M_0}{P_w(1+t)} t}{e_s \frac{M_0}{P_w} - e_D \frac{M_0}{P_w(1+t)}} M_0 = - \left[\frac{\frac{e_D t}{(1+t)}}{e_s - \frac{e_D}{(1+t)}} \right] M_0$$

It can now be seen that if the elasticity of import supply approaches infinity, c is reduced to zero and the change in the producer's welfare due to lower world market prices becomes negligible. Finally, d in Figure 3 can be calculated as

$$(9) \quad d = (P' - P_w)(M' - M_0)/2$$

Using equation (5) this becomes

$$d = -(P' - P_w)(P_0 - P')a/2$$

Substituting $P' - P_w$ and $P_0 - P'$ derived when calculating a and c

$$d = \frac{1}{2} \left[\frac{e_s t}{e_s - \frac{e_D}{(1+t)}} \right] \left[\frac{\frac{e_D t}{(1+t)}}{e_s - \frac{e_D}{(1+t)}} \right] \frac{e_D M_0}{(1+t)}$$

which reduces to

$$d = \frac{1}{2} \left[\frac{\frac{e_s e_D^2 t^2}{(1+t)^2}}{\left(e_s - \frac{e_D}{(1+t)} \right)^2} \right] M_0$$

As mentioned above, welfare loss of foreign producers becomes negligible if the supply elasticity $\hat{\alpha}_s$ are very large.

APPLICATION TO SOUTH AFRICAN DATA

Equations (2) – (9) can be set up in a spreadsheet in such a way that elasticities can be changed to any level and the gains and losses of tariff reduction are determined instantly. We have applied the above methodologies to a number of data sources, which will be discussed together with the results below.

Table 1: Imports (R million '96 pr), tariffs ('96 schedule) and net change in welfare (small country assumption, import demand elasticity: 1.56, R million '96 pr)

	SIC	Sector	¹ Imports (million '96)	² (R Tariff schedule)	³ (1996 Net welfare million $\hat{\alpha}_p = 1.56$)	⁴ in Net welfare/ Imports
1	3843/0	Motor vehicles	24,392.51	39.7%	2,145.92	8.8%
2	3,220	Wearing apparel exc footwear	3,995.83	67.3%	842.70	21.1%
3	3,240	Footwear	2,453.65	38.7%	206.87	8.4%
4	3,211	Spinning, wool,weaving & finishing of fabrics	3,264.82	32.3%	200.85	6.2%
5	3,213	Knitting mills	2,351.32	33.4%	152.91	6.5%
6	3,111	Slaughtering, preparing & preserving meat	9,576.59	15.4%	152.80	1.6%
7	3,118	Sugar factories & refineries	2,139.76	35.0%	151.40	7.1%
8	3,212	Made-up textile goods, exc wearing apparel	1,396.36	40.6%	127.71	9.1%
9	3,112	Dairy products	2,134.48	30.6%	119.04	5.6%
10	3,117	Bakery products	2,880.78	25.8%	119.00	4.1%
11	3,131	Distilleries & wineries	2,243.33	29.3%	116.20	5.2%
12	3,140	Tobacco products	1,732.81	32.0%	104.81	6.0%
13	3,523	Soap, cosmetics & toilet preparations	3,780.66	19.1%	89.91	2.4%
14	3,320	Furniture	2,589.87	22.1%	80.89	3.1%
15	1,100	Agriculture, forestry and fishing	11,747.13	8.8%	64.38	0.5%
16	3,233	Leather products & leather substitutes	926.68	28.3%	45.18	4.9%
17	3,113	Canning & preserving of fruit & vegetables	2,851.55	14.6%	41.22	1.4%
18	353/4	Other basic chemicals, petroleum & coal	7,362.00	8.6%	39.38	0.5%
19	2,100	Mining	52,086.58	3.0%	34.12	0.1%
20	3,819	Other fabricated metals, exc machinery	3,801.67	7.8%	16.66	0.4%
21	3,560	Other plastic products	1,157.20	14.2%	15.94	1.4%
22	3,551	Tyres & tubes	933.51	14.4%	13.22	1.4%
23	3,214	Carpets & rugs, mats & matting	302.28	26.6%	13.17	4.4%
24	3,833	Electrical appliances & housewares	625.66	17.7%	12.95	2.1%
25	3,122	Prepared animal feeds	1,158.66	11.7%	11.04	1.0%
26	3,119	Cocoa, chocolate & sugar confectionery	1,254.85	11.2%	10.97	0.9%
27	3,811	Cutlery, hand tools & general hardware	1,348.94	10.6%	10.63	0.8%
28	3,829	Other machinery & equipment, exc electrical	14,698.62	2.8%	8.93	0.1%
29	3,419	Other pulp, paper & paperboard	1,184.70	10.2%	8.77	0.7%
30	3,121	Other food products	2,172.62	7.0%	7.83	0.4%
31	3,710	Iron & steel basic industries	12,325.15	2.7%	6.58	0.1%
32	3,813	Structural metal products	1,858.83	6.4%	5.60	0.3%
33	3,812	Furniture & fixtures primarily of metal	347.06	15.2%	5.42	1.6%
34	3,691	Bricks, tiles, refractories, etc	495.40	12.4%	5.30	1.1%
35	3,411	Pulp, paper & paperboard	2,533.88	5.2%	5.08	0.2%
36	3,215	Cordage, rope & twine industries	178.35	20.8%	4.96	2.8%
37	3,610	Pottery, china & earthenware	181.87	20.4%	4.88	2.7%
38	3,115	Vegetable & animal oils & fats	2,306.52	5.2%	4.64	0.2%
39	3,620	Glass & glass products	1,007.28	7.5%	4.11	0.4%
40	3,831	Electrical industrial machinery	3,717.98	3.6%	3.69	0.1%
41	3851/4/5/9	Other transport	5,624.45	2.9%	3.64	0.1%
42	3,134	Soft drinks & carbonated waters industries	2,105.64	4.8%	3.57	0.2%
43	3,720	Non-ferrous metal basic industries	3,610.21	3.6%	3.56	0.1%
44	3,521	Paints, varnishes & lacquers	607.77	9.0%	3.49	0.6%
45	3,219	Textiles, not elsewhere classified	251.71	13.3%	3.04	1.2%
46	3,420	Printing & publishing	5,152.95	2.5%	2.49	0.0%
47	3,699	Other non-metallic mineral products	673.06	6.6%	2.13	0.3%
48	3,116	Grain mill products	3,734.02	2.7%	2.08	0.1%
49	3,832	Radio, television & communication equipment	7,286.17	1.7%	1.60	0.0%
50	3,513	Synthetic resins & plastic materials	1,249.58	4.1%	1.55	0.1%
51	3,310	Wood & wood products, exc furniture	1,388.82	3.8%	1.48	0.1%
52	3,511	Industrial chemicals	9,562.88	1.2%	1.03	0.0%
53	3,529	Other chemical products	3,423.81	1.9%	0.96	0.0%
54	3,839	Other electrical apparatus & supplies	1,834.94	2.5%	0.87	0.0%
55	386,390,239,033,909	Other manufacturing industries	6,594.55	1.2%	0.73	0.0%
56	3,821	Engines & turbines	1,008.65	2.6%	0.53	0.1%
57	3,114	Canning, preserving & processing of fish	2,136.57	1.6%	0.43	0.0%
58	3,133	Malt liquors & malt	3,564.82	0.9%	0.23	0.0%
59	3,901	Jewellery and related articles	1,428.13	1.2%	0.15	0.0%
60	3,512	Fertilizers & pesticides	1,211.44	1.0%	0.09	0.0%
61	3,824	Special industrial machinery & equipment	7,157.83	0.2%	0.02	0.0%
62	3,822	Agricultural machinery & equipment	381.33	0.6%	0.01	0.0%
63	3,522	Medicinal & pharmaceutical preparations	2,676.69	0.2%	0.01	0.0%
64	3,692	Cement	29.17	0.8%	0.00	0.0%
65	3,823	Metal & woodworking machinery	2,879.40	0.1%	0.00	0.0%
66	3,825	Office, computing & accounting machinery	5,184.07	0.0%	0.00	0.0%

Source: Kuhn and Jansen 1996, and own calculations

Using IDC data for 1996

We start by employing data published by the IDC (Kuhn and Jansen 1997), which is shown in columns 1 – 2 of Table 1. The results of equation (6), i.e., the net welfare changes (area *c-b* in Figure 3) for the small country assumption ($\xi = \text{very large}$) are shown in column 3. These results are based on an import price elasticity ($\hat{\alpha}$) of 1.56 for all sectors following Gumede (2000). In order to place the welfare changes in a better context, we divide them by the imports of the relevant sector.

It can be seen that *motor vehicles, textile, clothing, footwear* and *food processing* sectors offer the largest net gains to the consumer in South Africa. Note that the consumer welfare changes are net of the losses in government revenue, assuming that this would have been redistributed to consumers one way or another.

It should be realised that all import demand elasticities are set to equal to the value -1.56 , i.e., across all sectors. Changing the elasticities uniformly across these sectors will not change the ranking of the sectors. The challenge is therefore to find estimates of sector specific import demand function. Gumede (2000) has also made an attempt to estimate import price elasticities for a limited number of sectors. Most of the results 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.

Table 2: Estimated import price elasticities used in the welfare gains and losses calculations

Sector	Estimated import price elasticity
1. chemicals	-0.3010
2. machinery	-0.2125
3. elect. machinery	-0.1130
4. manufacturing	-0.3640

Source: Gumede 2000

It can be seen that the estimated import price elasticities are much lower than the -1.56 used above. As a result, the welfare effects will be only be about a quarter to a fifth of what is estimated in Table 1 above. This can be seen in the next table.

Table 3: Imports (R million '96 pr), tariffs ('96 schedule) and net change in welfare (small country assumption, sector specific import demand elasticities, R million '96 pr)

	SIC	Sector	1 Imports (R million '96)	2 Tariff (1996 schedule)	3 Net Ä in welfare Rm'96 specific Ä _D	4 Net Ä in sector welfare/ Imports
1	3843/0	Motor vehicles	24,392.51	39.7%	500.63	2.1%
2	3,220	Wearing apparel exc footwear	3,995.83	67.3%	196.60	4.9%
3	3,240	Footwear	2,453.65	38.7%	48.26	2.0%
4	3,211	Spinning, wool, weaving & finishing of fabrics	3,264.82	32.3%	46.86	1.4%
5	3,213	Knitting mills	2,351.32	33.4%	35.67	1.5%
6	3,111	Slaughtering, preparing & preserving meat	9,576.59	15.4%	35.65	0.4%
7	3,118	Sugar factories & refineries	2,139.76	35.0%	35.32	1.7%
8	3,212	Made-up textile goods, exc wearing apparel	1,396.36	40.6%	29.79	2.1%
9	3,112	Dairy products	2,134.48	30.6%	27.77	1.3%
10	3,117	Bakery products	2,880.78	25.8%	27.76	1.0%
11	3,131	Distilleries & wineries	2,243.33	29.3%	27.11	1.2%
12	3,140	Tobacco products	1,732.81	32.0%	24.45	1.4%
13	3,320	Furniture	2,589.87	22.1%	18.87	0.7%
14	3,523	Soap, cosmetics & toilet preparations	3,780.66	19.1%	17.34	0.5%
15	1,100	Agriculture, forestry and fishing	11,747.13	8.8%	15.02	0.1%
16	3,233	Leather products & leather substitutes	926.68	28.3%	10.54	1.1%
17	3,113	Canning & preserving of fruit & vegetables	2,851.55	14.6%	9.62	0.3%
18	2,100	Mining	52,086.58	3.0%	7.96	0.0%
19	353/4	Other basic chemicals, petroleum & coal	7,362.00	8.6%	7.60	0.1%
20	3,560	Other plastic products	1,157.20	14.2%	3.07	0.3%
21	3,214	Carpets & rugs, mats & matting	302.28	26.6%	3.07	1.0%
22	3,122	Prepared animal feeds	1,158.66	11.7%	2.58	0.2%
23	3,119	Cocoa, chocolate & sugar confectionery	1,254.85	11.2%	2.56	0.2%
24	3,551	Tyres & tubes	933.51	14.4%	2.55	0.3%
25	3,811	Cutlery, hand tools & general hardware	1,348.94	10.6%	2.48	0.2%
26	3,819	Other fabricated metals, exc machinery	3,801.67	7.8%	2.27	0.1%
27	3,419	Other pulp, paper & paperboard	1,184.70	10.2%	2.05	0.2%
28	3,121	Other food products	2,172.62	7.0%	1.83	0.1%
29	3,710	Iron & steel basic industries	12,325.15	2.7%	1.53	0.0%
30	3,691	Bricks, tiles, refractories, etc	495.40	12.4%	1.24	0.2%
31	3,829	Other machinery & equipment, exc electrical	14,698.62	2.8%	1.22	0.0%
32	3,411	Pulp, paper & paperboard	2,533.88	5.2%	1.19	0.0%
33	3,215	Cordage, rope & twine industries	178.35	20.8%	1.16	0.6%
34	3,610	Pottery, china & earthenware	181.87	20.4%	1.14	0.6%
35	3,115	Vegetable & animal oils & fats	2,306.52	5.2%	1.08	0.0%
36	3,620	Glass & glass products	1,007.28	7.5%	0.96	0.1%
37	3,833	Electrical appliances & housewares	625.66	17.7%	0.94	0.1%
38	3851/4/5/9	Other transport	5,624.45	2.9%	0.85	0.0%
39	3,134	Soft drinks & carbonated waters industries	2,105.64	4.8%	0.83	0.0%
40	3,720	Non-ferrous metal basic industries	3,610.21	3.6%	0.83	0.0%
41	3,813	Structural metal products	1,858.83	6.4%	0.76	0.0%
42	3,812	Furniture & fixtures primarily of metal	347.06	15.2%	0.74	0.2%
43	3,219	Textiles, not elsewhere classified	251.71	13.3%	0.71	0.3%
44	3,521	Paints, varnishes & lacquers	607.77	9.0%	0.67	0.1%
45	3,420	Printing & publishing	5,152.95	2.5%	0.58	0.0%
46	3,699	Other non-metallic mineral products	673.06	6.6%	0.50	0.1%
47	3,116	Grain mill products	3,734.02	2.7%	0.49	0.0%
48	3,310	Wood & wood products, exc furniture	1,388.82	3.8%	0.35	0.0%
49	3,513	Synthetic resins & plastic materials	1,249.58	4.1%	0.30	0.0%
50	3,831	Electrical industrial machinery	3,717.98	3.6%	0.27	0.0%
51	3,511	Industrial chemicals	9,562.88	1.2%	0.20	0.0%
52	3,529	Other chemical products	3,423.81	1.9%	0.18	0.0%
53	386,390,239,033,909	Other manufacturing industries	6,594.55	1.2%	0.17	0.0%
54	3,832	Radio, television & communication equipment	7,286.17	1.7%	0.12	0.0%
55	3,114	Canning, preserving & processing of fish	2,136.57	1.6%	0.10	0.0%
56	3,821	Engines & turbines	1,008.65	2.6%	0.07	0.0%
57	3,839	Other electrical apparatus & supplies	1,834.94	2.5%	0.06	0.0%
58	3,133	Malt liquors & malt	3,564.82	0.9%	0.05	0.0%
59	3,901	Jewellery and related articles	1,428.13	1.2%	0.03	0.0%
60	3,512	Fertilizers & pesticides	1,211.44	1.0%	0.02	0.0%
61	3,824	Special industrial machinery & equipment	7,157.83	0.2%	0.00	0.0%
62	3,822	Agricultural machinery & equipment	381.33	0.6%	0.00	0.0%
63	3,522	Medicinal & pharmaceutical preparations	2,676.69	0.2%	0.00	0.0%
64	3,692	Cement	29.17	0.8%	0.00	0.0%
65	3,823	Metal & woodworking machinery	2,879.40	0.1%	0.00	0.0%
66	3,825	Office, computing & accounting machinery	5,184.07	0.0%	0.00	0.0%

Source: Kuhn and Jansen 1996, and own calculations

Because the variation in the estimated elasticities shown in Table 2 is relatively small, the ranking of Table 3 is not much different compared to Table 1.

Using Customs and Excise data for 1998 with recent IDC data

Using Customs & Excise data for 2000 with July 2000 tariff data

We conclude this section with an application of the same methodology now using *ad valorem* tariff data for July 2000 (excluding non-*ad valorem* tariffs, which only apply to about 4% of total imports), available from DTI, and 2000 import data. In doing so, we hope to pick up some trends now that we can add a second observation to 1996.

Table 4: South Africa Merchandise Imports (2000) and import weighted tariffs, ranked according to tariff (R million, current prices)

	Imports	Tariff		Imports	Tariff		
1	HS24: Tobacco and manufactured tobacco substitutes.	23	42.9%	50	HS06: Live trees and other plants; bulbs, roots and t	37	4.2%
2	HS98: Special classifications provisions	15,008	35.0%	51	HS53: Other vegetable textile fibres; paper yarn and w	56	4.1%
3	HS87: Vehicles (excluding railway or tramway rolling-s	10,566	31.5%	52	HS89: Ships, boats and floating structures.	107	4.0%
4	HS62: Items of app and clothing acc, not knitted or cr	37	31.1%	53	HS12: Oil seeds and oleaginous fruits; miscellaneous g	222	3.7%
5	HS57: Carpets and other textile floor coverings.	144	30.0%	54	HS37: Photographic or cinematographic goods.	612	3.5%
6	HS64: Footwear, gaiters and the like; parts of such it	666	28.1%	55	HS85: Electrical machinery and equipment and parts the	23,600	3.5%
7	HS42: Items of leather; saddlery and harness; travel g	358	28.1%	56	HS44: Wood and items of wood; wood charcoal	1,015	3.2%
8	HS66: Umbrellas, sun umbrellas, walking-sticks, seat s	29	27.3%	57	HS11: Products of the milling industry; malt; starches	191	3.0%
9	HS65: Headgear and parts thereof	93	26.1%	58	HS45: Cork and items of cork	773	2.9%
10	HS61: Items of app and clothing acc, knitted or croche	41	25.0%	59	HS74: Copper and items thereof	330	2.8%
11	HS19: Preparations of cereals, flour, starch, or milk;	146	24.3%	60	HS72: Iron and steel.	1,721	2.7%
12	HS63: Other made up textile items; sets; worn clothing	140	22.8%	61	HS32: Tanning or dyeing extracts, tannins and their de	1,321	2.7%
13	HS16: Preparations of mat, of fish or of crustaceans,	18	22.7%	62	HS03: Fish and crustaceans, molluscs and other aquatic	10	2.1%
14	HS60: Knitted or crocheted fabrics.	129	20.2%	63	HS49: Printed books, newspapers, pictures and other pr	998	1.9%
15	HS93: Arms and ammunition; parts and acc thereof.	0	20.0%	64	HS95: Toys, games and sports requisites; parts and acc	1,293	1.4%
16	HS46: Manufactures of straw, of esparto or of other pl	30	17.5%	65	HS55: Man-made staple fibres.	391	1.3%
17	HS94: Furniture; bedding, mattresses, mattress support	1,019	17.4%	66	HS25: Salt, sulphur, earths and stone, plastering mate	610	1.3%
18	HS02: Meat and edible meat offal	596	17.1%	67	HS36: Explosives; pyrotechnic products; matches; pyrop	110	1.2%
19	HS22: Beverages, spirits and vinegar.	96	16.5%	68	HS09: Coffee, tea, mate and spices	290	1.0%
20	HS17: Sugars and sugar confectionery	117	16.2%	69	HS29: Organic chemicals.	4,321	1.0%
21	HS67: Prepared feathers and down and items made of fea	40	15.5%	70	HS71: Natural or cultured pearls, precious or semi-pre	3,551	0.9%
22	HS45: Cork and items of cork	455	15.1%	71	HS38: Miscellaneous chemical products.	3,120	0.9%
23	HS34: Soap, organic surface-active agents, washing pre	489	14.6%	72	HS28: Inorganic chemicals; organic or inorganic compou	3,841	0.9%
24	HS40: Rubber and items thereof.	2,305	14.1%	73	HS84: Nuclear reactors, boilers, machinery and mechani	29,124	0.8%
25	HS83: Miscellaneous items of base metal.	537	13.6%	74	HS90: Optical, photographic, cinematographic, measurin	6,516	0.5%
26	HS56: Wadding, felt and nonwovens; special yarns; twin	217	13.4%	75	HS51: Wool, fine or coarse animal hair; horsehair yarn	114	0.2%
27	HS54: Man-made filaments	502	13.0%	76	HS30: Pharmaceutical products.	4,293	0.1%
28	HS58: Special woven fabrics; tufted textile fabrics; l	150	12.3%	77	HS10: Cereals	1,165	0.0%
29	HS59: Impregnated, coated, covered or laminated textil	470	12.2%	78	HS35: Albuminoidal substances; modified starches; glue	448	0.0%
30	HS20: Preparations of vegetables, fruit, nuts or other	125	12.1%	79	HS27: Mineral fuels, oils and products of their distil	25,685	0.0%
31	HS96: Miscellaneous manufactured items.	501	11.9%	80	HS01: Live animals	44	0.0%
32	HS33: Essential oils and resinoids; perfumery, cosmeti	959	10.3%	81	HS05: Products of animal origin, not elsewhere specifi	159	0.0%
33	HS07: Edible vegetables and certain roots and tubers	185	10.3%	82	HS14: Vegetable plaiting materials; vegetable products	32	0.0%
34	HS52: Cotton	12	9.8%	83	HS26: Ores, slag and ash.	226	0.0%
35	HS48: Paper and paperboard; items of paper pulp, of p	2,437	9.2%	84	HS31: Fertilizers.	858	0.0%
36	HS70: Glass and glassware.	672	8.2%	85	HS45: Cork and items of cork	164	0.0%
37	HS18: Cocoa and cocoa preparations	212	7.6%	86	HS47: Pulp of wood or of other fibrous cellulosic mate	275	0.0%
38	HS39: Plastics and items thereof.	5,109	7.2%	87	HS50: Silk	24	0.0%
39	HS76: Aluminium and items thereof	699	7.1%	88	HS75: Nickel and items thereof	762	0.0%
40	HS23: Residues and waste from the food industries; pre	839	6.4%	89	HS78: Lead and items thereof.	45	0.0%
41	HS69: Ceramic products.	1,553	6.1%	90	HS79: Zinc and items thereof.	111	0.0%
42	HS68: Items of stone, plaster, cement, asbestos, mica	448	6.0%	91	HS80: Tin and items thereof.	84	0.0%
43	HS04: Dairy produce; birds' eggs; natural honey; edibl	14	5.8%	92	HS81: Other base metals; cermets: items thereof.	145	0.0%
44	HS13: Lac; gums, resins and other vegetable saps and e	119	5.7%	93	HS86: Railway or tramway locomotives, rolling-stock an	103	0.0%
45	HS82: Tools, implements, cutlery, spoons and forks, of	1,095	5.7%	94	HS88: Aircraft, spacecraft and parts thereof.	4,748	0.0%
46	HS73: Items of iron or steel.	2,026	5.6%	95	HS91: Clocks and watches and parts thereof.	335	0.0%
47	HS41: Raw hides and skins (excluding furskins) and lea	728	4.9%	96	HS92: Musical instruments; parts and acc of such items	57	0.0%
48	HS08: Edible fruit and nuts; peel of citrus fruit or	147	4.9%	97	HS97: Works of art, collectors' pieces and antiques.	220	0.0%
49	HS43: Furskins and artificial fur; manufactures there	4	4.7%	98	:	:	:

Source: Customs and Excise and DTI

In Table 5 it can be seen that the highest import duties are recorded for *tobacco* and *original equipment components* (HS2: 98). Tariffs on *clothing* have dropped from levels higher than 55% to below 30%. *Motor vehicle* tariffs on the other hand have risen from 20% to 31%,

which is probably the result of the import weighting procedure, with imports switching to the higher tariff lines in the group. The HS2 commodity groups of large value with relatively high tariffs are *unclassified, motor vehicles and rubber products* and, to a lesser degree, *furniture* (see row 17).

This is confirmed in Table 6 where it is shown that the HS2 commodity groups with the largest values receive relatively low protection, except the groups mentioned above. These include, amongst others, machinery, electrical machinery and fuels, and also some chemicals groups and special equipment.

Table 5: South Africa Merchandise Imports (2000) and import weighted tariffs, ranked according to value of imports (R million, current prices)

	Imports	Tariff		Imports	Tariff		
1	HS84: Nuclear reactors, boilers, machinery and mechani	29,124	0.8%	50	HS09: Coffee, tea, mate and spices	290	1.0%
2	HS27: Mineral fuels, oils and products of their distil	25,685	0.0%	51	HS47: Pulp of wood or of other fibrous cellulosic mate	275	0.0%
3	HS85: Electrical machinery and equipment and parts the	23,600	3.5%	52	HS26: Ores, slag and ash.	226	0.0%
4	HS98: Special classifications provisions	15,008	35.0%	53	HS12: Oil seeds and oleaginous fruits; miscellaneous g	222	3.7%
5	HS87: Vehicles (excluding railway or tramway rolling-s	10,566	31.5%	54	HS97: Works of art, collectors' pieces and antiques.	220	0.0%
6	HS90: Optical, photographic, cinematographic, measurin	6,516	0.5%	55	HS56: Wadding, felt and nonwovens; special yarns; twin	217	13.4%
7	HS39: Plastics and items thereof.	5,109	7.2%	56	HS18: Cocoa and cocoa preparations	212	7.6%
8	HS88: Aircraft, spacecraft and parts thereof.	4,748	0.0%	57	HS11: Products of the milling industry; malt; starches	191	3.0%
9	HS29: Organic chemicals.	4,321	1.0%	58	HS07: Edible vegetables and certain roots and tubers	185	10.3%
10	HS30: Pharmaceutical products.	4,293	0.1%	59	HS45: Cork and items of cork	164	0.0%
11	HS28: Inorganic chemicals; organic or inorganic compou	3,841	0.9%	60	HS05: Products of animal origin, not elsewhere specifi	159	0.0%
12	HS71: Natural or cultured pearls, precious or semipre	3,551	0.9%	61	HS58: Special woven fabrics; tufted textile fabrics; l	150	12.3%
13	HS38: Miscellaneous chemical products.	3,120	0.9%	62	HS08: Edible fruit and nuts; peel of citrus fruit or	147	4.9%
14	HS48: Paper and paperboard; items of paper pulp, of p	2,437	9.2%	63	HS19: Preparations of cereals, flour, starch, or milk;	146	24.3%
15	HS40: Rubber and items thereof.	2,305	14.1%	64	HS81: Other base metals; cermet: items thereof.	145	0.0%
16	HS73: Items of iron or steel.	2,026	5.6%	65	HS57: Carpets and other textile floor coverings.	144	30.0%
17	HS72: Iron and steel.	1,721	2.7%	66	HS63: Other made up textile items; sets; worn clothing	140	22.8%
18	HS69: Ceramic products.	1,553	6.1%	67	HS60: Knitted or crocheted fabrics.	129	20.2%
19	HS32: Tanning or dyeing extracts, tannins and their de	1,321	2.7%	68	HS20: Preparations of vegetables, fruit, nuts or other	125	12.1%
20	HS95: Toys, games and sports requisites; parts and acc	1,293	1.4%	69	HS13: Lac; gums, resins and other vegetable saps and e	119	5.7%
21	HS10: Cereals	1,165	0.0%	70	HS17: Sugars and sugar confectionery	117	16.2%
22	HS82: Tools, implements, cutlery, spoons and forks, of	1,095	5.7%	71	HS51: Wool, fine or coarse animal hair; horsehair yarn	114	0.2%
23	HS94: Furniture; bedding, mattresses, mattress support	1,019	17.4%	72	HS79: Zinc and items thereof.	111	0.0%
24	HS44: Wood and items of wood; wood charcoal	1,015	3.2%	73	HS36: Explosives; pyrotechnic products; matches; pyrop	110	1.2%
25	HS49: Printed books, newspapers, pictures and other pr	998	1.9%	74	HS89: Ships, boats and floating structures.	107	4.0%
26	HS33: Essential oils and resinoids; perfumery, cosmeti	959	10.3%	75	HS86: Railway or tramway locomotives, rolling-stock an	103	0.0%
27	HS31: Fertilizers.	858	0.0%	76	HS22: Beverages, spirits and vinegar.	96	16.5%
28	HS23: Residues and waste from the food industries; pre	839	6.4%	77	HS65: Headgear and parts thereof	93	26.1%
29	HS45: Cork and items of cork	773	2.9%	78	HS80: Tin and items thereof.	84	0.0%
30	HS75: Nickel and items thereof	762	0.0%	79	HS92: Musical instruments; parts and acc of such items	57	0.0%
31	HS41: Raw hides and skins (excluding furskins) and lea	728	4.9%	80	HS53: Other vegetable textile fibres; paper yarn and w	56	4.1%
32	HS76: Aluminium and items thereof	699	7.1%	81	HS78: Lead and items thereof.	45	0.0%
33	HS70: Glass and glassware.	672	8.2%	82	HS01: Live animals	44	0.0%
34	HS64: Footwear, gaiters and the like; parts of such it	666	28.1%	83	HS61: Items of app and clothing acc, knitted or croche	41	25.0%
35	HS37: Photographic or cinematographic goods.	612	3.5%	84	HS67: Prepared feathers and down and items made of fea	40	15.5%
36	HS25: Salt, sulphur, earths and stone, plastering mate	610	1.3%	85	HS06: Live trees and other plants; bulbs, roots and t	37	4.2%
37	HS02: Meat and edible meat offal	596	17.1%	86	HS62: Items of app and clothing acc, not knitted or cr	37	31.1%
38	HS83: Miscellaneous items of base metal.	537	13.6%	87	HS14: Vegetable plaiting materials; vegetable products	32	0.0%
39	HS54: Man-made filaments	502	13.0%	88	HS46: Manufactures of straw, of esparto or of other pl	30	17.5%
40	HS96: Miscellaneous manufactured items.	501	11.9%	89	HS66: Umbrellas, sun umbrellas, walking-sticks, seat s	29	27.3%
41	HS34: Soap, organic surface-active agents, washing pre	489	14.6%	90	HS50: Silk	24	0.0%
42	HS59: Impregnated, coated, covered or laminated textil	470	12.2%	91	HS24: Tobacco and manufactured tobacco substitutes.	23	42.9%
43	HS45: Cork and items of cork	455	15.1%	92	HS16: Preparations of meat, of fish or of crustaceans,	18	22.7%
44	HS35: Albuminoidal substances; modified starches; glue	448	0.0%	93	HS04: Dairy produce; birds' eggs; natural honey; edibl	14	5.8%
45	HS68: Items of stone, plaster, cement, asbestos, mica	448	6.0%	94	HS52: Cotton	12	9.8%
46	HS55: Man-made staple fibres.	391	1.3%	95	HS03: Fish and crustaceans, molluscs and other aquatic	10	2.1%
47	HS42: Items of leather; saddlery and harness; travel g	358	28.1%	96	HS43: Furskins and artificial fur; manufactures there	4	4.7%
48	HS91: Clocks and watches and parts thereof.	335	0.0%	97	HS93: Arms and ammunition; parts and acc thereof.	0	20.0%
49	HS74: Copper and items thereof	330	2.8%	98	:	:	:

Source: Customs and Excise, and IDC

As with the earlier results, we report on net welfare changes expressed in terms of R millions and as a proportion of total imports. On the left hand side of the next table we show results for the economy-wide import demand elasticity of 1.56 while on the right hand side we show the results for sector-specific import demand elasticities. As before, the small country assumption is chosen so that the export demand elasticity is very large.

Due to the small variation in the estimates of the import demand elasticities, the ranking of HS2 commodities is identical. In both cases unclassified commodities offer the largest consumer gains following the full elimination trade barriers followed by the HS2 group of complete motor vehicles. This includes mainly original equipment components for motor vehicles (HS8: 98010030-40).

Table 6: Net change in welfare (July 2000 tariff schedule, small country assumption, import demand elasticity: -1.56 and sector specific import demand elasticities respectively, R million '00 pr)

Based on economy-wide import demand elasticity of -1.56		Net changes in welfare	As % of imports	Based on sector specific import demand elasticities		Net changes in welfare	As % of imports
1	HS98: Special classifications provisions	-1,061	15,008	1	HS98: Special classifications provisions	-248	-1.7%
2	HS87: Vehicles (excluding railway or tramway rolling-s	-623	10,566	2	HS87: Vehicles (excluding railway or tramway rolling-s	-145	-1.4%
3	HS64: Footwear, gaiters and the like; parts of such it	-32	666	3	HS64: Footwear, gaiters and the like; parts of such it	-7	-1.1%
4	HS40: Rubber and items thereof.	-31	2,305	4	HS40: Rubber and items thereof.	-7	-0.3%
5	HS85: Electrical machinery and equipment and parts the	-22	23,600	5	HS85: Electrical machinery and equipment and parts the	-5	0.0%
6	HS94: Furniture; bedding, mattresses, mattress support	-20	1,019	6	HS94: Furniture; bedding, mattresses, mattress support	-5	-0.5%
7	HS39: Plastics and items thereof.	-19	5,109	7	HS39: Plastics and items thereof.	-4	-0.1%
8	HS42: Items of leather; saddlery and harness; travel g	-17	358	8	HS42: Items of leather; saddlery and harness; travel g	-4	-1.1%
9	HS48: Paper and paperboard; items of paper pulp, of p	-15	2,437	9	HS48: Paper and paperboard; items of paper pulp, of p	-3	-0.1%
10	HS02: Meat and edible meat offal	-12	596	10	HS02: Meat and edible meat offal	-3	-0.5%
11	HS57: Carpets and other textile floor coverings.	-8	144	11	HS57: Carpets and other textile floor coverings.	-2	-1.3%
12	HS33: Essential oils and resinoids; perfumery, cosmeti	-7	959	12	HS33: Essential oils and resinoids; perfumery, cosmeti	-2	-0.2%
13	HS34: Soap, organic surface-active agents, washing pre	-7	489	13	HS34: Soap, organic surface-active agents, washing pre	-2	-0.3%
14	HS45: Cork and items of cork	-7	455	14	HS45: Cork and items of cork	-2	-0.4%
15	HS83: Miscellaneous items of base metal.	-7	537	15	HS83: Miscellaneous items of base metal.	-2	-0.3%
16	HS54: Man-made filaments	-6	502	16	HS54: Man-made filaments	-1	-0.3%
17	HS19: Preparations of cereals, flour, starch, or milk;	-5	146	17	HS19: Preparations of cereals, flour, starch, or milk;	-1	-0.9%
18	HS96: Miscellaneous manufactured items.	-5	501	18	HS96: Miscellaneous manufactured items.	-1	-0.2%
19	HS59: Impregnated, coated, covered or laminated textil	-5	470	19	HS59: Impregnated, coated, covered or laminated textil	-1	-0.2%
20	HS63: Other made up textile items; sets; worn clothing	-5	140	20	HS63: Other made up textile items; sets; worn clothing	-1	-0.8%
21	HS73: Items of iron or steel.	-5	2,026	21	HS73: Items of iron or steel.	-1	-0.1%
22	HS69: Ceramic products.	-4	1,553	22	HS69: Ceramic products.	-1	-0.1%
23	HS65: Headgear and parts thereof	-4	93	23	HS65: Headgear and parts thereof	-1	-1.0%
24	HS60: Knitted or crocheted fabrics.	-3	129	24	HS60: Knitted or crocheted fabrics.	-1	-0.6%
25	HS70: Glass and glassware.	-3	672	25	HS70: Glass and glassware.	-1	-0.1%
26	HS56: Wadding, felt and nonwovens; special yarns; twin	-3	217	26	HS56: Wadding, felt and nonwovens; special yarns; twin	-1	-0.3%
27	HS82: Tools, implements, cutlery, spoons and forks, of	-3	1,095	27	HS82: Tools, implements, cutlery, spoons and forks, of	-1	-0.1%
28	HS76: Aluminium and items thereof	-3	699	28	HS76: Aluminium and items thereof	-1	-0.1%
29	HS23: Residues and waste from the food industries; pre	-2	839	29	HS23: Residues and waste from the food industries; pre	-1	-0.1%
30	HS24: Tobacco and manufactured tobacco substitutes.	-2	23	30	HS24: Tobacco and manufactured tobacco substitutes.	-1	-2.3%
31	HS62: Items of app and clothing acc, not knitted or cr	-2	37	31	HS62: Items of app and clothing acc, not knitted or cr	0	-1.3%
32	HS17: Sugars and sugar confectionery	-2	117	32	HS17: Sugars and sugar confectionery	0	-0.4%
33	HS22: Beverages, spirits and vinegar.	-2	96	33	HS22: Beverages, spirits and vinegar.	0	-0.4%
34	HS61: Items of app and clothing acc, knitted or croche	-2	41	34	HS61: Items of app and clothing acc, knitted or croche	0	-0.9%
35	HS58: Special woven fabrics; tufted textile fabrics; l	-2	150	35	HS58: Special woven fabrics; tufted textile fabrics; l	0	-0.2%
36	HS84: Nuclear reactors, boilers, machinery and mechani	-1	29,124	36	HS84: Nuclear reactors, boilers, machinery and mechani	0	0.0%
37	HS07: Edible vegetables and certain roots and tubers	-1	185	37	HS07: Edible vegetables and certain roots and tubers	0	-0.2%
38	HS66: Umbrellas, sun umbrellas, walking-sticks, seat s	-1	29	38	HS66: Umbrellas, sun umbrellas, walking-sticks, seat s	0	-1.1%
39	HS41: Raw hides and skins (excluding furskins) and lea	-1	728	39	HS41: Raw hides and skins (excluding furskins) and lea	0	0.0%
40	HS20: Preparations of vegetables, fruit, nuts or other	-1	125	40	HS20: Preparations of vegetables, fruit, nuts or other	0	-0.2%
41	HS68: Items of stone, plaster, cement, asbestos, mica	-1	448	41	HS68: Items of stone, plaster, cement, asbestos, mica	0	-0.1%
42	HS72: Iron and steel.	-1	1,721	42	HS72: Iron and steel.	0	0.0%
43	HS18: Cocoa and cocoa preparations	-1	212	43	HS18: Cocoa and cocoa preparations	0	-0.1%
44	HS44: Wood and items of wood; wood charcoal	-1	1,015	44	HS44: Wood and items of wood; wood charcoal	0	0.0%
45	HS32: Tanning or dyeing extracts, tannins and their de	-1	1,321	45	HS32: Tanning or dyeing extracts, tannins and their de	0	0.0%
46	HS67: Prepared feathers and down and items made of fea	-1	40	46	HS67: Prepared feathers and down and items made of fea	0	-0.4%
47	HS46: Manufactures of straw, of esparto or of other pl	-1	30	47	HS46: Manufactures of straw, of esparto or of other pl	0	-0.5%
48	HS16: Preparations of meat, of fish or of crustaceans,	-1	18	48	HS16: Preparations of meat, of fish or of crustaceans,	0	-0.8%
49	HS37: Photographic or cinematographic goods.	-1	612	49	HS37: Photographic or cinematographic goods.	0	0.0%

Source: Customs and Excise, and IDC

CONCLUSIONS

What are the policy conclusions of these results? First of all, it is clear that from a static economic analysis perspective, there are considerable costs involved in maintaining tariffs in South Africa that take the form of forgone consumer surplus. These costs typically depend on:

- The value of the imports of the commodity, i.e., the higher the value, the higher the costs
- The level of the tariff of the commodity, i.e., the higher the tariff, the higher the costs. As shown in measurement of b , the losses rise exponentially with tariff increases.
- The level of the import price elasticity of the commodity, i.e., the higher the elasticity, the more sensitive the demand for imports to price changes following a reduction in the tariff and therefore the higher the costs while making the small country assumption in that the supply of imports is given and South Africa has no control over it.

Over the period 1996 – 2000, the total costs of tariff protection have come down considerably as can be seen in the next table. Interestingly, the trends has been somewhat reversed between 1998 and 2000. Several reasons may be advanced for this turn around. First, tariff data are not consistently drawn from the same source. Second, the HS2 level of commodity groups is a considerable aggregation and it may well be that within a particular group, imports have shifted from low tariff to high tariff, so that the import weighted average tariff for the group as a whole has risen. Third, certain tariffs on a narrow group such as tobacco have indeed increased. Finally, initial imports (M_0) have increased in spite of high tariffs such as motor vehicles and original equipment components, which have risen from R15 billion to R25 billion between 1998 and 2000.

Table 7: Aggregate costs of tariff protection in South Africa (R million, current prices)

	$\hat{p} =$ sector	
	$\hat{p} = 1.56$	specific
1996	5,049	1,164
2000	1,972	460

Source: own calculations

The highest costs of maintaining tariffs is counted for motor vehicles and original equipment components thereof. The main reason is the high value of the imports as well as the high level of the tariff. Further analysis is recommended with regard to detailed commodities that are currently “hidden” in the special classifications category (HS98). Although some clothing commodities face even higher tariffs, the welfare losses of maintaining the existing tariff are less. Over the period 1996 – 2000 welfare costs of protection on textile, clothing and footwear commodities has declined considerably and the same applies to some of the processed food commodities.

If this analysis is useful, and we would like to argue that it is, the final question is where to take it from here. Now that DTI is in the process of obtaining regular trade and tariff data from Customs and Excise. The first step would be to integrate the two sources into one with a common set of HS8 codes. A second step is to attempt an estimation of import demand and export supply elasticities at a more detailed level of commodity groups. Customs and Excise data are available on a monthly basis from 1988 onwards. Even if monthly data may be

volatile, panel estimation techniques could perhaps be employed on a quarterly or annual basis. In terms of the choice of explanatory variables, it may possible to follow some of the directions indicated by Gumede (2000).

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