and final goods is the same, whereas Balassa assumes tha the elasticity of supply of non-tradables is infinite. Another reason advanced by the authors for this divergence is that ,using the Corden method , allowance is made for the fact that most sectors simultaneously import as well as export. The Balassa formulation implies that an industry receives protection on the proportion of output it sells on the world market at world market prices(7).

From the results for 1956/57 a number of sectors have negative protective rates (21 out of 45). Using the Corden formulation the highest rates of effective protection were levied on grain mill products, cement, pulp and paper, baking and furniture, while the lowest rates were found in sectors such as tobacco, petroleum and coal, textiles, motor vehicles and breweries. In addition one can notice the gradation tendency in the tariff in South Africa, viz. those sectors primarily catering for final consumption generally yield higher levels than sectors catering for intermediate demand.

In the results for 1963/64 for 29 sectors the same tendency is visible in respect of the 2 different formulae. The sectors enjoying the highest rate of protection were beverages and tobacco, petroleum and coal and leather products, while sectors with the lowest rates include transport equipment, furniture and basic industrial chemicals.

In both years there was a particularly wide divergence in effective rates, far greater than the variation in nominal rates. In the aggregatic of certain sectors for 1956/57 the authors attempt to arrive at a similar classification as shown by the 1963/64 input-output table, and they arrive at what is regarded as comparable figures for the two time periods (Table 6.3). The level of both nominal and effective protection increased over the period.

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(7) Ibid., p.375

TABLE 6.3

COMPARISON OF COMPUTED EFFECTIVE TARIFF RATES FOR 1956/57 AND 1963/64

		1956/57		1963/64			
		Nominal Tariff Rates	Effective Tariff Rates	Nominal Tariff Rates	Effective Tariff Rates	% Change Nominal Rates	% Change Effective Rates
1.	Agriculture	0.4	0.07	7.8	2.95	1,850	4,114
2.	Gold Mining	0	-2.74	0	-1.08	0	61
3.	Coal Mining	0	-2.74	0	-1.87	0	32
4.	Other Mining	0	-3.04	0	-1.07	0	65
5.	Processed Food	2.8	16.1	3.6	2.76	29	-83
6.	Beverages & Tobacco	77.1	-17.31	94.0	231.61	22	1,438
7.	Textiles	7.8	0.88	8.3	2.56	6	843
8.	Knitting Mills	13.0	9.36	12.5	1.15	-4	-88
9.	Clothing	19.6	18.33	19.8	29.89	1	63
10.	Footwear	6.2	1.27	15.4	22.44	148	1,667
11.	Wood & Wood Prod.	1.2	-2.59	2.7	-0.97	125	63
12.	Furniture	22.5	35.87	1.6	-14.42	-93	-140
13.	Paper & Paper Prod.	2.4	20.18	3.4	-5.27	42	-126
14.	Printing & Publ.	8.4	7.81	4.0	17.47	-52	124
15.	Leather	2.6	0.43	5.2	35.69	100	8,200
16.	Rubber	17.9	17.46	13.2	17.8	-26	2
17.	Basic. Ind. Chemicals	0.6	-1.4	1.4	-8.54	133	-510
18.	Misc. Chemicals	8.6	1.93	2.1	2.09	-76	8
19.	Petrol & Coal	40.4	-22.22	71.0	79.53	76	458
20.	Mineral Products	9.8	9.81	8.6	9.2	-12	-6
21.	Basic Iron & Steel	11.0	-2.65	[illegible].7	13.02	30	391
22.	Basic Non-Ferrous	0	-2.09	[illegible]	7.18		444
23.	Metal Products	3.6	1.45	[illegible]	7.73	89	433
24.	Machinery	1.3	-1.94	[illegible]	9.81	23	606
25.	Electrical Machinery	3.6	0.84	3.3	2.56	6	205
26.	Transport Equipment	3.6	1.3	1.1	-26.3	-69	-212
27.	Motor Vehicles	9.1	-9.84	6.2	- 6.13	32	38
28.	Misc. Manufacture	7.5	4.79	7.3	3.26	3	32

Source: Merle Holden, op. cit., p.46.
This table is reprinted in Merle Holden and Paul Holden, 'An International Calculation of Effective Rates of Protection for South Africa.' S.A.J.E. Vol. 43(3), Sept 1975, p.378.

Those sectors where nominal rates changed most were agriculture, footwear, basic industrial chemicals and wood and wood products, whereas the sectors which had the largest changes in effective rates were leather products, footwear, agriculture, beverages and tobacco. Thus there appeared to be little relationship between changes in nominal rates and effective rates and this places a huge question mark on the intentions of tariff-making authorities in their tariff-making policy.

In the doctoral thesis, Holden uses non-parametric statistical techniques to show that effective rates provide a better measure than nominal rates in indicating the movement in resources over the period(8). With the aid of the Fisher Exact Test and relating changes in tariffs with changes in other variables such as changes in employment and changes in imports, he shows that where there exists a significant relationship between the tariff rate and the relevant variable, the effective rate was more significantly associated with the variable than was the nominal rate(9).

In discussing the relationship between tariff changes and the ratio of imports to domestic supply, there was found to be negative correlation. Higher effective rates were grouped with lower growth rates. It was only in those sectors with a lot of import substitution already prevalent, i.e. where imports comprised only a small proportion of total supply, that any correlation between effective protective rates and import substitution existed(10). The implications one can draw from this are two-fold. One can deduce that effective tariff rates were insufficient to have any effect on import substitution during the period, and that in those sectors in which import substitution had taken place to a significant degree, high levels of protection were still necessary in order to ensure that imported goods were not substituted for domestically-produced goods. In other words

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(8) Merle Holden op.cit., p.104

(9) Merle G. Holden, loc. cit.,

(10) Ibid., p.90.

the questions of the effectiveness of the tariff and the efficiency of industries that have enjoyed tariff protection must be reviewed, if these results are correct.

In Table 6.4 there is a subdivision of the various industries in the 1956/57 input-output table into the following categories:

(i) domestic consumption goods (sectors 6,7,10,11,12,13,14,15,16,17,21,22,25).

(ii) intermediate goods (sectors 18,20,23,24,26-33,35).

(iii) capital equipment and investment goods (sectors 36-44).

(iv) export-orientated goods (sectors 1-3,5,8,9,20,39).

(v) imported goods (sectors 18-20,24,26,29,31-33,35,38-45).

This classification is devised from the input-output table according to the breakdown into the various categories. For the categories imports and exports, a critical level of 20 per cent of the value of domestic production was assumed to be the relevant figure for classification purposes, while the classification into the other broad sectors was conducted in a rather arbitrary manner according to the proportions of consumption and intermediate good production that were indicated by the input-output table.

Each of these sectors were weighted according to their contribution to total output and from the Holden figures for effective tariff protection (according to the Corden method) for 1956/57 a weighted average tariff for each of the categories was calculated. As far as domestic consumption was concerned the weighted average figure amounted to 10,98 per cent, that for intermediate goods 3,07 per cent, for capital equipment and investment goods -1,4 per cent, for exports 0,11 per cent and for imported goods -3,15 per cent.

A similar exercise conducted for 1963/64 (Table 6.5) shows the weighted average levels of protection for these categories as being 14,6 per cent for domestic consumption, 5,5 per cent for intermediate goods, 1,87 for invest-

TABLE 6.4

Weighted Average Rates of Effective Tariff Protection 1956/57 (according to various categories of use)

Domestic Consumption			Intermediate Goods		
Sectors	Effective Protection (Corden)	Weights	Sectors	Effective Protection (Corden)	Weights
6	- 1,91	2,8	18	3,98	1,5
7	12,62	0,7	20	-3,64	0,2
10	65,02	1,9	23	-12,98	0,3
11	39,1	0,7	24	-2,59	0,8
12	6,9	1,0	26	-1,94	0,4
13	- 3,31	0,4	27	39,80	0,7
14	- 4,42	1,5	28	7,81	1,1
15	14,56	1,2	29	0,43	0,3
16	- 7,75	0,5	30	17,46	0,9
17	-57,09	1,2	31	-1,40	1,6
21	1,27	0,8	32	1,93	1,9
22	18,33	2,5	33	-22,22	2,5
25	35,87	1,0	35	13,48	0,3
Wtd Average	10,98	17,2	Wtd Average	3,07	12,5
Capital Equipment and Investment Goods			Exports		
36	44,76	0,4	1	0,07	12,0
37	-0,33	0,6	2	-2,74	6,4
38	-2,65	1,8	3	-2,74	0,5
39	-2,09	0,6	5	-1,91	1,6
40	1,45	2,9	8	5,86	0,7
41	-1,94	2,2	9	65,02	0,3
42	0,84	0,8	20	-3,64	0,2
43	1,30	0,5	39	-2,09	0,6
44	-9,84	3,1			
Wtd Average	-1,4	12,9	Wtd Average	0,11	22,3

Table 6.4 continued

Imported Goods

Sectors	Effective Protection (Corden)	Weights
18	3,98	1,5
19	9,36	0,4
20	-3,64	0,2
24	-2,59	0,8
26	-1,94	0,4
29	0,43	0,3
31	-1,40	1,6
32	1,93	1,9
33	-22,22	2,5
35	13,48	0,3
38	-2,65	1,8
39	-2,09	0,6
40	1,46	2,9
41	-1,94	2,2
42	0,84	0,8
43	1,30	0,5
44	-9,84	3,1
45	4,79	1,1
Wtd Average	-3,15	22,9

Source: Merle Holden, op. cit.,
Input-Output table 1956/7

TABLE 6.5

Weighted Average Rates of Effective Protection 1963/64 (according to various categories of use)

Domestic Consumption			Intermediate Goods		
Sector	Effective Protection (Corden)	Weights	Sector	Effective Protection (Corden)	Weights
1	2,95	8,6	1	2,95	8,6
5	2,76	7,7	3	-1,87	0,5
6	231,61	1,5	4	-1,07	2,7
7	2,56	3,4	7	2,56	3,4
8	1,15	1,5	10	22,44	0,2
9	29,89	0,5	11	-0,97	0,9
12	-14,42	0,6	13	-5,27	1,5
14	17,47	0,9	14	17,47	0,9
16	17,80	1,8	15	35,69	2,2
17	-8,54	1,4	16	17,80	1,8
26	2,56	3,8	17	-8,54	1,4
27	-26,30	1,3	18	5,59	0,7
			19	0,20	1,5
	Wtd Average 14,6	33		Wtd Average 5,5	26,3

Investment goods + capital equipment			Exports		
21	9,20	0,6	1	2,95	8,6
22	13,02	3,4	2	-1,08	0,6
23	7,18	3,5	4	-1,07	2,7
24	7,73	1,9	5	2,76	7,7
25	9,81	0,9		Wtd Average 2,2	19,6
26	2,56	3,8			
27	-26,30	1,3			
28	-6,13	6,0.			
29	3,26	2,0			
	Wtd Average 1,87	23,4			

Table 6.5 continued

Imported Goods

Sector	Effective Protection (Corden)	Weight
4	-1,07	2,7
7	2,56	3,4
10	22,44	0,2
11	-0,97	0,9
13	-5,27	0,9
17	-8,54	0,7
23	7,18	3,5
24	7,73	1,9
25	9,81	0,9
26	2,56	3,8
27	-26,30	1,3
Wtd Average	1,13	23,4

Source: Merle Holden, op. cit.,

Input-output table 1963/4

ment goods and capital equipment, 2,2 per cent for exported goods and 1,13 per cent for imported. These figures are not comparable to the 1956/57 figures, because of the differing levels of aggregation in input-output tables over the two time periods. They do however tend to show how the tariff structure in South Africa conforms to that in many other countries in that high tariffs are levied on final consumer goods, while lower tariffs are levied on intermediate goods and capital equipment. Extremely low tariffs were levied on goods that are exported, while the types of goods that the country is importing in rather large amounts at present are subject to the lowest average tariff level. The perturbing feature of these results, if they are correct, is that tariff policy in South Africa is still aimed primarily at protecting those sectors that have substituted for consumer goods that were previously imported - namely the category domestic consumption. Similarly, one can argue the relatively low duties levied on intermediate goods, investment goods and capital equipment and other import competing products have resulted in large amounts of imports of these goods.

Several objections can be levelled at the methodology used by the Holdens in estimating effective rates of protection for South Africa. The relevance of these objections casts doubt on the validity of their results. The major criticism concerns the method used to calculate nominal rates of protection, which in turn forms an integral part of the formulation for effective rates of protection. By dividing the duties collected by the total imports for each sector - unweighted - the averages are understated. The value of imports is itself affected by the height of the tariff and, at the extreme, the most strongly protective duties would be those that would not enter the calculation at all. In other words, if domestic production in a sector has been encouraged to such an extent that it has totally supplanted imports

of that particular sector, such protection would not be accounted for. In addition, by not using a weighted average those goods that are imported on a small scale are given unduly high weighting.

Another factor which the Holden estimate neglects concerns the level of aggregation in input-output tables. Most of the sectors in the classification produce a variety of products for both intermediate and final usage. The average nominal tariff, as calculated by the authors for the various sectors comprise tariffs on final as well as intermediate goods and the size of the average rate of duties will depend on the values of the respective goods imported. Using the above method of calculation, in the event of sector A importing only final goods the average tariff will not be a true reflection of the tariff on intermediate inputs and hence its use in calculating effective protection for another sector B that uses the intermediate products of sector A as an input will be limited.

Yet another factor concerns the assumption of fixed coefficients in the intertemporal comparison of input-output tables. Tariffs can well induce changes in the type of input used in a productive process. The average nominal tariff rates as calculated by Holden may not refer to changes in tariff levels, but changes in imports. On the assumption of zero elasticities of substitution and demand between local and imported products, it would be correct to identify these as changes in the average rates of duty. But this depends on what goods one is considering. It could be argued that any increase in nominal rates, if there exists positive elasticity, will serve as a stimulus for local production and a reduction in imports.

In summary, one can state that the Holden results yield interesting conclusions concerning the level of effective protection in South Africa, yet the methodology is subject to certain reservations which cast some doubt on the validity of these measurements.

6.3 The du Plessis measure

The other major work on effective tariff protection for South Africa was performed by S.P.J. du Plessis in 1975[11]. In his conclusions of effective tariffs, the author used an unpublished official input-output table prepared at producer prices for 1963/64. This table showed the total value of output, the value added and the value of secondary inputs for each of the 82 sectors[12]. The calculation of nominal tariffs involved the use of unpublished official statistics showing the net value of imports, and duties collected for more than 2000 commodity items for the year 1964. 'These statistics were classified on the same basis as the input-output table and in addition distinguished between imports destined for final consumption and for intermediate use'[13]. Although the method used by du Plessis to calculate the average nominal output tariff for a sector is broadly similar to that of Holden, in that the total value of duties is expressed as a percentage of the total value of imports, du Plessis' measure is preferable to Holden's in that the former measure distinguishes output and input tariffs. What du Plessis has done, is to separate the value of imports for intermediate usage from those used in final stages, and so, by taking into account the relevant duties at various stages, nominal rates are calculated for both final goods and intermediate products. Another area in which the du Plessis measure is more refined than the Holden measure is the much lower level of aggregation. There are approximately 3 times as many sectors in the du Plessis measure and this implies that one can better appreciate and evaluate the level of protection on a specific sector at the much lower level of aggregation.

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(11) S.P.J. du Plessis, 'n Ekonomies-Politieke Evaluering van Suid-Afrika se Invoer Tarief-beleid op grond van die Teorie van Effektiewe Tariefbeskerming'. Ph.D. R.A.U. Jhb 1974.
See also, Effective Tariff Protection in South Africa, S.A.J.E. Vol. 44, No. 2, June 1976 pp.158-170.

(12) S.P.J. du Plessis, Effective Tariff Protection in South Africa, op.cit., p.165

(13) Ibid., p.165.

These factors are responsible for widespread differences in the two measures. The du Plessis results show a close rank correlation between effective and nominal rates(14). As can be seen from the results, reproduced in Table 6.6,there are no sectors where nominal and effective rates are exactly equal. The results show (as was the case with Holden) that the range of rates differs far more for effective rates than is the case with nominal rates. Of the 79 sectors, 19 have negative effective tariffs while 17 have effective rates,which although positive,are smaller than the respective nominal rates. Du Plessis calculates that the share in the total value added,in which effective rates are smaller than nominal rates,amounts to 76 per cent of total production(15). However, he qualifies this by redefining the magnitude of difference to 1 per cent,and on the revised calculation arrives at an estimate of 37 per cent of all production, and 19 per cent of industrial production has smaller effective than nominal protection. His conclusion is that, 'this could imply that in a substantial number of cases the import tariff system does not serve as a stimulus to growth, but rather that, if anything, it has the opposite effect'(16). This issue is perturbing and du Plessis thereafter raises the interesting point that there could be an unnecessary cost increasing element inherent in the tariff structure in South Africa insofar as negative effective tariffs could induce the authorities to use other growth promoting measures more intensively than would have been necessary had particul r import tariffs exhibited the intended or desired effect.

In his doctoral thesis du Plessis presents a table that is reproduced in Table 6.7showing the weighted average tariff according to different stages of production.

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(14) Ibid., p.166

(15) Ibid., p.167

(16) Ibid., p.167

TABLE 6.6

ESTIMATES OF EFFECTIVE TARIFF PROTECTION FOR SOUTH AFRICA
1963/64

SECTOR (1)		(2)	(3)	(4)
ISIC NO	Description	Nominal Tariff (%)	Effective Tariff (%)	Effective Tariff/ Nominal Tariff
010-040	Agriculture, forestry, hunting and fishing	6,3	1,6	0,25
110	Coal mining	0	-0,9	-
121 & 140	Iron ore mining, stone quarrying, clay and sand pits	0,6	-0,3	-0,50
122	Other metal mining	0	-1,0	-
190	Other mining	0,2	-0,6	-3,0
201	Slaughtering, preparation and preserving of metal	3,0	22,1	7,37
202	Dairy products	12,3	40,6	3,30
203	Canning and preserving of fruits and vegetables	15,4	4,3	0,28
204	Canning and preserving of fish and other sea foods	8,7	-2,2	-0,25
205	Grain mill products	12,5	3,7	0,30
206	Bakeries	20,4	38,7	1,90
207	Sugar factories and refineries	0,5	0	0
208	Cocoa, chocolate and sugar confectionary	8,1	7,9	0,97
209	Prepared feeds for animals and poultry	5,2	-8,1	-1,56
210	Misc. food production	2,2	-2,2	-1,0
213	Breweries and manufacturing of malt	20,8	31,8	1,53

214	Soft drinks and carbonated water industries	8,3	8,6	1,04
220	Tobacco manufactures	23,6	14,6	0,62
231,1	Wool scouring & combing, cotton ginning and fibre working	2,8	5,5	1,96
231,2	Blankets	21,5	46,7	2,17
231,3	Spinning, weaving and finishing of other wool products	13,9	29,5	2,12
231,4	Spinning, weaving and finishing of other cotton products	11,2	17,6	1,57
232,1	Hosiery and other knitted clothing mills	19,9	30,0	1,51
232,2	Other knitting mills	15,2	26,3	1,73
233	Cordage, rope and twine	6,3	9,1	1,44
239	Textiles N.E.S.	12,5	15,1	1,21
241	Footwear	20,0	36,5	1,83
243	Othe wearing apparel	19,0	27,8	1,46
244,1	Soft furnishings	13,1	16,2	1,24
244,2	Bags and sacks	13,3	27,3	2,05
244,3	Tents, sails and automotive textile goods	0,7	-7,6	-10,86
250	Wood mills, wooden and cane industries	2,3	2,2	0,96
260	Furniture and fixtures	19,7	32,3	1,64
271	Pulp, paper and paperboard	2,4	2,0	0,83
272,1	Paper bags and cardboard containers	1,9	0,2	0,11
272,2	Stationery	23,0	57,9	2,52
272,3	Other paper products	12,9	22,8	1,77
280	Printing and publishing	4,5	5,6	1,24
291	Tanneries and leather finishing plants	1,6	2,6	1.63

293	Manufacture of leather products except footwear and wearing apparel	14,4	22,0	1,53
300	Rubber products	19,4	30,6	1,58
311,1	Fertilizers	0	-3,1	-
311,2	Tanning extract.	1,8	-24,2	-13,44
311,3	Explosives	3,8	3,0	0,79
311,4	Other basic industrial chemicals	3,2	0,9	0,28
312	Vegetable and animal oils and fats	2,6	-12,5	-4,81
319,1	Paints, varnishes, laquers, distempers	5,3	1,7	0,32
319,2	Disinfectants, insecticides, weed-killers	1,0	-5,5	-5,50
319,3	Misc. chemical products	6,1	-2,0	-0,33
321	Petroleum refineries	56,2	93,5	1,66
322/29	Misc. products of petroleum and coal	8,8	3,9	0,44
331	Structural clay products	4,1	4,2	1,02
332	Glass and glass products	7,7	9,1	1,18
333	Pottery, china and earthen ware	30,2	41,9	1,39
334	Cement	1,6	1,7	1,06
339	Other non-metallic mineral products	5,0	5,9	1,18
341	Basic iron and steel	1,2	0,4	0,33
342	Basic non-ferrous metals	1,3	0,8	0,62
350,1	Metal pipes and fittings	4,7	7,0	1,49
350,2	Headed and threaded articles	10,6	18,1	1,71
350,3	Sheet metal products, except tinware	5,8	9,3	1,60

350,4	Tinware	23,6	89,6	3,80
350,5	Wire products	1,3	-0,6	-0,46
350,6	Metal products N.E.S., except machinery and transport equipment	7,7	11,8	1,53
360,1	Agricultural machinery and appliances	0,3	-2,2	-7,33
360,2	Office machinery and appliances	6,7	7,4	1,10
360,3	Industrial mining and construction machinery	1,4	-0,7	-0,50
360,4	Machine '.S., except electrical machinery	2,3	0	0
370,1	Electrical machinery	3,2	1,4	0,44
370,2	Insulated cables and wires	3,7	5,6	1,51
370,3	Electrical household appliances	7,5	5,8	0,77
381	Ship building and repairing	0,8	-0,4	-0,50
382	Railroad equipment	1,0	-2,7	-2,70
383	Motor vehicles, caravans, trailers, spares and accessories	14,9	18,9	1,27
385	Motor cycles and bicycles	15,5	21,6	1,39
386	Aircraft	0	-1,2	-
389	Transport equipment, N.E.S.	13,0	15,5	1,19
399,1	Plastic products, fibreglass	16,3	29,6	1,82
399,2	Manufacturing industries, N.E.S.	18,2	22,0	1,21

Source: S.P.J. du Plessis, Effective Tariff Protection in South Africa, S.A.J.E. " 1. 44(2) June 1976, pp. 168-170.

TABLE 6.7

Nominal and Effective Tariffs according to various Sectors

Sector	t_j	g Balassa	G Corden
A	0,1	-1,1	-0,9
B	2,3	2,4	1,7
C	7,1	15,3	10,3
D	11,5	25,8	16,1
E	1,5	-0,8	-0,7
B-E	8,0	14,7	10,0

The sectors refer to the following groups of industries:

A - mining

B - industries manufacturing intermediate goods using raw materials as secondary inputs

C - industries manufacturing intermediate goods using processed materials as secondary inputs

D - industries manufacturing final goods

E - capital production industries

Source: S.P.J. du Plessis, (1974), op. cit., p. 199.

The conclusions from this Table conform broadly with those discussed previously in connection with the Holden thesis. There is a definite gradation in the tariff structure in South Africa. Industries producing capital goods and intermediate goods with raw materials as secondary inputs (sectors E and B) have extremely low levels of protection. Export-oriented industries show negative rates of protection.

The highest levels of tariff protection are applied to industries manufacturing final goods.

6.4 An alternative measure of effective tariff protection

The various difficulties and reservations expressed concerning the accuracy and, hence, usefulness of estimates of effective rates of tariff

protection, which appear particularly relevant in the South Africa context as a result of the paucity of data, lead one to consider the question of how applicable these are to the tariff-making authorities in a particular country. The numerous complex conceptual problems may well be beyond the capabilities of these authorities and they may well assume the attitude that the theory of effective protection and attempts at estimation of these rates are simply not worth the efforts involved. The following analysis is presented as a practical alternative for tariff-making authorities.

Because a great deal of the problems involved in estimating effective tariffs in the South African context refer to the input-output table, i.e. its level of aggregation, and the fact that the classification does not refer to tariff nor to foreign trade classifications, it is suggested that use be made of industrial census material which are both more recent and frequent compared to input-output tables. Industrial censuses are conducted in South Africa according to various stages of manufacture and these are disaggregated in an extremely detailed manner. In addition they show all the intermediate inputs used by each sector and the total imports of each sector. By using a nominal tariff (from tariff data) on imported inputs a measure of nominal tariffs will be used that evades the problem of estimating these by dividing the level of duties received by the total imports for each sector. Thus to summarize the advantages of such a measure -

(i) it can be applied to a disaggregated number of industries

(ii) it utilizes actual tariff levels as reflected by tariff schedules

(iii) it does not rely on outdated input-output data

(iv) the principles involved in estimating effective rates of protection are still adhered to, despite the different tools used.

The model incorporates the following terms.

P_f = the price of a good in terms of foreign currency

g = the proportion of imports in the total production of a good

Pd = the price of a good in terms of local currency

R = the official exchange rate

S = the amount of foreign exchange saved in terms of foreign currency

M = the import of the raw material in terms of local currency

T = the nominal tariff on a good in its final stages

t = the nominal tariff on the imported intermediate good

Z = the cost of saving one unit of foreign exchange in terms of domestic resources

V = value added

E = the effective rate of protection

Now

(1) $Pd = RP_f (1+t)$

This implies that the local price of a good exceeds the foreign price by the amount of the tariff. In other words, tariffs are assumed to be the only form of distortion.

(2) $S = P_f (1-g)$

The saving of foreign currency is equivalent to that amount of the foreign good that is produced domestically or the local value added in terms of foreign currency.

(3) $M = P_f gR (1+t)$

The value of the imported raw material is weighted according to its proportion to total output.

The value added in terms of local currency can be expressed as

(4) $Pd-M = RP_f (1+T) - R P_f g (1+t) = R P_f (1+T)-g (1+t)$

In other words, the cost of saving one unit of currency in terms of domestic resources will be

$$(5) \qquad Z = \frac{R\,P_f\,(1+T)-g\,(1+t)}{P_f(1-g)} = R\,\frac{(1+T)-g(1+t)}{1-g}$$

From (5) one can derive the effective rate of protection which can be expressed as

$$(6) \qquad \frac{Z}{R} = R \quad \frac{(1+T)-g(1+t)}{1-g}/R$$

$$(7) \qquad E = \frac{(1+T)-g(1+t)}{1-g}$$

In (7) the components of effective protection have been reduced to the nominal tariff on the final good (T), the proportion of imported materials (g) and the tariff on the imported intermediate product or raw material (t) - all of which are available to tariff-making authorities for the various industries requesting tariff protection.

The following examples indicate how effective protection for an industry can be crudely calculated.

Assume that in the production of footwear the tariff on footwear is 30 per cent, that on imported leather is 8 per cent, while the proportion of imported materials used is 17 per cent.

$T = 0,3$

$t = 0,08$

$g = 0,17$

$$E = \frac{(1+T)-g(1+t)}{1-g}$$

$$E = \frac{1,3 - 0,17\ (1,08)}{0,83} = 1,345$$

In other words, effective protection is approximately 35 per cent.

In the production of motor cars, assume that the tariff on the final good is 45 per cent, on imported components 20 per cent and the value added of imported materials is 40 per cent.

$$E = \frac{1,45 - 0,4\ (1,20)}{0,6} = 1,62$$

The above examples refer to actual tariff levels taken from the tariff schedule for April 1975 while the value added and proportions of imported raw materials were extracted from the census of manufacturing 1967-68, materials purchased and sold. The exercise can be conducted for a number of industrial groups and ought to give tariff-making authorities some indication of the protection in the production process as various industries submit applications for tariff protection.

6.5 Summary

On the evidence of the two detailed studies that have been conducted concerning levels of effective tariff protection in South Africa, despite some reservations that one can express about the methodology (which may be excusable in the South African context because of the lack of data), the results, while not comparable, do tend to indicate a number of relevant characteristics. Firstly, as both studies bear out, there exists a definite tendency in the protective structure, as far as tariffs are concerned, for consumer goods to enjoy far higher levels than intermediate goods and capital equipment. This applied during the 'fifties as well as the 'sixties. As the South African economy had undergone structural changes since the start of industrialization, and import replacement during the 'fifties and 'sixties appeared to be limited to more intermediate goods and capital equipment, the relevance of the protective structure to changed conditions in the country should be questioned. The issue that consumer

goods industries still required relatively high levels of effective protection, despite the fact that many of these goods were being produced locally, implies that exports of such goods (upon which the Reynders Commission placed so much emphasis as a means of solving the structural balance of payments problem) hardly appear possible, if on the domestic market these products do not seem able to compete successfully without this protection. Furthermore, the structure of protection has encouraged the importation of capital goods and intermediate products while it appears to have taxed the exportation of agricultural produce and raw materials. The experience of South Africa in this regard is not unique - in fact, South Africa seems to typify several other countries that have attempted to industrialize by encouraging import substitution. It is in the later stages of import substitution, once the local production and assembly of goods in a finished stage has been completed, that tariff policy requires a fundamental change in order to encourage further development.

CHAPTER 7

TARIFF PROTECTION, INDUSTRIAL GROWTH AND FUTURE POLICY REQUIREMENTS IN SOUTH AFRICA

7.1 Introduction

Stephen Guisinger[1] comments that many of the conclusions that have been drawn from numerous empirical studies of effective protection in various countries have been limited to a relatively narrow range of issues. These issues have been confined to the problems of estimation that have resulted from the lack of relevant and accurate data, and the arbitariness of many of the assumptions necessary to compute effective rates. In addition to the problems of estimation several studies have restricted themselves to comparison between various countries. There have only been a few studies attempting to correlate the values of estimated effective rates with other important characteristics of an economy. Balassa[2] and Basevi[3] used calculations of effective rates to show that the degree of labour-intensiveness in manufacturing industries is not correlated with levels of effective rates in industrial countries. Guisinger suggests that the paucity of such economic studies is a reflection of the suspicion with which economists regard the estimates of effective rates.

'If the predictions of the effective rate theory could be confirmed by empirical data, then the usefulness of these country studies would have been

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(1) S. Guisinger, 'The Characteristics of Protected Industries in Pakistan,' in Effective Tariff Protection, edited by H.G. Grubel and H.G. Johnson, Proceedings of a Conference sponsored by the General Agreement on Tariffs and Trade and the Graduate Institute of International Studies, Geneva, 1971.

(2) B. Balassa, Industrial Protection in Developing Countries, Washington I.B.R.D. 1970

(3) G. Basevi 'The U.S. Tariff Structure,' Review of Economics and Statistics, May 1966, pp.147-60.

demonstrated'(4).

In this chapter an attempt is made to relate the conclusions on the measures of effective protection for South Africa to the pattern of industrial growth during the 'sixties and 'seventies in an endeavour to test the validity of these predictions. The necessity for restricting the analysis to this recent period arises because of the paucity of data concerning tariffs and industrial growth that would enable such a type of analysis to be conducted for earlier periods. However, from various reports by several commissions of enquiry into tariff policy, certain trends were discerned during the earlier period. Similarly, as was evident in the previous chapter, the various measures of effective protection in South Africa during the 'fifties and 'sixties suggested that the nature of tariff policy in South Africa had an influence on the pattern of industrial growth. This chapter presents an analysis of import substitution and export expansion over the period 1967-1973 in terms of input-output analysis. It was necessary to restrict the analysis to this period for it is the only period over which input-output data are reasonably comparable. An implicit assumption is that the trends in effective tariffs as indicated for the 'fifties and early 'sixties influenced the pattern of industrial growth and, as there appeared no drastic revision in tariff structure in later years, these trends persisted. The analysis of import substitution is conducted in terms of the revised measure, referred to in an earlier chapter.

On the evidence of this analysis, a possible development strategy is suggested for the South African economy in the light of present circumstances, and recommendations for the tariff policy required to restore South Africa to a path of growth and development are suggested.

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(4) S. Guisinger, op.cit., p.182.

7.2 Import substitution in the South African context

Table 7.1 shows the conventional and redefined measures of import substitution in absolute terms during the period 1967-1973. The measures were obtained from the 1967 input-output table released by the Department of Planning and the 1973 Economic Development Programme, issued by the office of the economic adviser to the Prime Minister. The reason for using this time period is that the classifications of industries are comparable.

The conventional measure is expressed by:

$$IS = (m_i^o/Z_i^o - m_i^t/Z_i^t)\ Z_i^t$$

where m_i^o/Z_i^o refers to the ratio of imports to total supply in the 1967 period and m_i^t/Z_i^t refers to the ratio in 1973. From these absolute figures the amount of foreign exchange saved by the various sectors can be assessed. Considerable replacement appeared to occur in several sectors such as agriculture, forestry and fishing (R19,24 mill), other food processing (R16,6 mill), spinning, weaving, knitting and finishing of textiles (R83,0 mill), printing and publishing (R21,3 mill), other basic chemicals (R134,0 mill), iron and steel (R61,7 mill), other fabricated metals (R17,0 mill) and railway equipment. In other words,a large part of the import replacement that occurred appeared to be confined to intermediate goods.

There was considerable negative import replacement in several sectors during the period. Industries such as wool scouring (R-12,5 mill), clothing R-29,3 mill), footwear (R-8,65 mill), synthetic resins (R-22,2 mill) and categories of machinery showed large increases in imports.

On the redefined measure[5] represented by

$$IS_j^* = (m_i^{o*}/Z_i^{o*} - m_i^{t*}/Z_i^{t*})\ Z_i^{t*}$$

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(5) See chapter 5 for an explanation of this concept.

TABLE 7.1

Conventional and redefined measures of import substitution for South Africa 1967-1973	I.S. (Rm)	I.S.* (Rm)
1. Agriculture, forestry and fishing	19,24	- 37,99
2. Gold and uranium ore mining	-	-
3. Coal mining	-	5,25
4. Other mining	7,66	21,17
5. Meat, dairy products and fish processing	- 1,95	- 5,26
6. Grain, sugar and animal feeds processing	8,05	- 42,2
7. Otherfood processing	16,6	19,2
8. Beverage industries	- 0,35	-
9. Tobacco products	1,14	1,1
10. Wool scouring, cotton ginning and dyeing of wool and cotton	- 12,5	- 14,34
11. Spinning, weaving, knitting and finishing of textiles	83,0	84,1
12. Clothing	- 29,3	- 29,7
13. Leather and leather products	- 1,84	- 2,33
14. Footwear	- 8,65	- 8,7
15. Wood and wood products	- 4,71	- 6,6
16. Furniture	- 0,35	- 0,56
17. Pulp, paper and paper board	5,08	5,17
18. Paper containers	0,15	- 0,72
19. Other pulp, paper and paper board articles	- 4,9	- 6,82
20. Printing and publishing	21,3	17,06
21. Fertilizers and pesticides	- 1,45	- 3,85
22. Synthetic resins, plastic materials and man-made fibres	- 22,22	- 15,6
23. Other basic chemicals and petroleum and coal products	134,0	131,9
24. Medicinal and pharmaceutical preparation	1,34	1,95
25. Soap and cleaning compounds and other toilet preparations	- 2,4	- 5,8
26. Paint and other chemical products	- 17,3	- 14,5
27. Rubber products	1,94	- 0,76
28. Other plastic products	- 25,15	- 22,2
29. Glass and glass products	6,5	7,3
30. Other non-metallic mineral products	- 9,0	- 5,4
31. Iron and steel basic industries	6,7	7,8
32. Non-ferrous metal basic industries	5,3	- 11,3
33. Structural metal products	-	-
34. Other fabricated metal products	77,0	71,9
35. Agricultural machinery and equipment	- 10,2	- 10,4
36. Other machinery, except electrical machinery	-100,22	-108,5
37. Electrical machinery, apparatus and supplies	- 26,9	- 32,4
38. Radio and television equipment	- 6,0	- 17,1
39. Motor vehicles	5,98	6,3
40. Motor vehicle parts	- 29,8	- 27,5
41. Railway equipment	92,5	- 2,5
42. Other transport equipment	- 7,8	- 10,0
43. Other manufacturing industries	23,2	26,7
44. Electricity, gas and steam	-	14,6
45. Water supply	-	1,3
46. Building construction	-	3,66
47. Civil engineering and other construction	-	-
48. Wholesale and retail trade and motor trade	-	-
49. Motor repair services	-	0,81
50. Transport, storage and communication	- 71,63	0,50
51. Other services	34,5	71,24
52. Goods and services not classified by destination	-	-

a better measure of the effect on foreign exchange is seen, for this measure incorporates the implicit or indirect imports. On the revised measure the sector agriculture, forestry and fishing shows a negative value (R-27,9 mill) as does grain, sugar and animal feeds processing (-R42,2 mill) and railway equipment (-R2,45 mill). The figures on the redefined measure show significant differences compared to the conventional measure in respect of several other sectors. Coal is indirectly imported in the redefined measure, whereas on the conventional measure there do not appear any imports of coal. The explanation for this is that coal is imported in an indirect form and increases in the domestic production of goods and services to replace imports further would tend to increase the domestic production of coal by R5,25 mill. Similar explanations can be given for other sectors such as electricity, gas and steam, water supply, and building and construction which are not imported directly.

The redefined measure is regarded as a more accurate measure of import substitution and the results and trends are, with one or two exceptions, similar to the conventional measure. It shows, as well, that import replacement appeared to be confined to several intermediate goods sectors, whereas large increases in imports occurred in several sectors producing finished goods such as clothing, footwear, leather products, wood products, furniture as well as the various categories of machinery.

In Table 7.2 the absolute import substitution figures derived for the various sectors are divided by the increase in domestic production in order to arrive at a proportionate measure of the increase in output attributable to import substitution. These are presented for both the IS* and IS measures. Again, the broad trends that were referred to earlier, concerning the type of import replacement that occurred as well as those industries that experienced an increase in imports, appear in a clearer form and are more comparable

TABLE 7.2

Import substitution as a proportion of change in production in the South African Economy 1967-1973	IS*/X (%)	IS/X (%)
1. Agriculture, forestry and fishing	- 9,7	4,7
2. Gold and uranium ore mining	–	–
3. Coal mining	5,6	–
4. Other mining	4,4	1,6
5. Meat, dairy products and fish processing	- 2,3	- 0,8
6. Grain, sugar and animal feeds processing	- 5,2	1,0
7. Other food processing	9,4	8,1
8. Beverage industries	–	–
9. Tobacco products	2,0	2,2
10. Wool scouring, cotton ginning and dyeing of wool and cotton	-204,6	-178,3
11. Spinning, weaving, knitting and finishing of textiles	28,9	28,5
12. Clothing	- 12,6	- 12,4
13. Leather and leather products	- 39,8	- 31,4
14. Footwear	- 23,4	- 23,2
15. Wood and wood products	- 9,8	- 7,0
16. Furniture	- 0,7	- 0,5
17. Pulp, paper and paper board	7,1	7,0
18. Paper containers	- 1,1	0,2
19. Other pulp, paper and paper board articles	- 4,2	- 3,0
20. Printing and publishing	14,3	17,8
21. Fertilizers and pesticides	- 11,5	- 4,3
22. Synthetic resins, plastic materials and man-made fibres	- 92,4	-131,5
23. Other basic chemicals and petroleum and coal products	- 34,9	35,4
24. Medicinal and pharmaceutical preparation	3,0	2,1
25. Soap and cleaning compounds and other toilet preparations	- 23,5	- 9,7
26. Paint and other chemical products	- 32,4	- 38,7
27. Rubber products	- 1,0	2,5
28. Other plastic products	- 44,0	- 49,8
29. Glass and glass products	13,8	12,3
30. Other non-metallic mineral products	- 2,5	- 4,2
31. Iron and steel basic industries	2,2	17,5
32. Non-ferrous metal basic industries	- 13,0	6,1
33. Structural metal products	–	–
34. Other fabricated metal products	19,1	20,5
35. Agricultural machinery and equipment	- 62,0	- 60,9
36. Other machinery, except electrical machinery	- 98,4	- 90,4
37. Electrical machinery, apparatus and supplies	- 49,8	- 41,3
38. Radio and television equipment	- 19,8	- 7,0
39. Motor vehicles	1,8	1,7
40. Motor vehicle parts	-118,6	-128,5
41. Railway equipment	- 2,9	107,4
42. Other transport equipment	–	–
43. Other manufacturing industries	14,7	12,8
44. Electricity, gas and steam	4,5	–
45. Water supply	2,7	–
46. Building construction	3,9	–
47. Civil engineering and other construction	–	–
48. Wholesale and retail trade and motor trade	–	–
49. Motor repair services	0,8	–
50. Transport, storage and communication	0,0	–
51. Other services	3,5	1,7
52. Goods and services not classified by destination	—	—

than the absolute figures. The IS* measure can be considered the more representative figure.

Looking at some of the industries that exhibited a relatively large degree of import substitution and relating these to the results of the various methods of calculating effective protection in South Africa (6), it is important to note that there appears little relationship between high levels of protection and increased import substitution. A similar trend is evident in looking at those sectors which encountered increased imports. Several of the consumer goods sectors are sectors enjoying relatively high levels of effective protection on both the Holden and du Plessis measures. Among the sectors that experienced relatively large import substitution, one finds coal mining (negatively protected) other mining (negatively protected), other foodstuffs (a low level of protection), pulp and paper (negative on the Holden measures) and other basic chemicals (low on both measures). Among the sectors that experienced large increases in the levels of imports, one finds wool scouring, cotton ginning and dyeing of wool and cotton (5,5 per cent on the du Plessis measure), clothing (approximately 30 per cent on both measures), leather and products (high on both measures) and footwear (high on both measures). At the other end, one finds vast increases in imports of agricultural machinery (-62 per cent IS*), electrical machinery (-49,8 per cent IS*), other machinery (-98,4 per cent IS*), radio and television equipment (-19,8 per cent IS*)- all sectors which were characterized by low levels of effective protection. Unfortunately, no detailed statistical correlation exercise can be done, because of the large differences in classification and time periods, but from these figures, treated as they have been, several important conclusions emerge.

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(6) See Chapter 6.

Tariff policy in South Africa - in so far as can be assessed from the various attempts at measuring levels of effective protection - appears to have had a definite effect on the volume and composition of imports. One can argue that the low levels of tariffs on capital goods and equipment and several intermediate products have induced a large volume of imports of these. Furthermore, the fact that several consumer goods industries experienced vast increases in imports despite high levels of tariff protection implies that these industries are inefficient if unable to compete domestically with imported goods from similar industries overseas. The substantial import substitution in several intermediate goods industries, despite low levels of protection, could largely be attributed to the natural growth process. In so far as import replacement has continued in final goods industries, the demand for the local production and processing of these intermediate industries has increased.

As it is not possible to assess what the level of imports would have been in the absence of tariffs, one cannot assess a priori how efficient the level of protection is in restricting imports. But the purpose of tariff protection is not designed solely as a means of curbing imports. The objectives of tariff policy are far wider. In the South African context, Kleu[7] lists these as being economic growth, efficiency in the use of resources, economic stability and decentralisation. He also lists some of the criteria used by the Board of Trade and Industries in granting tariff protection to particular industries.[8] These include inter alia that the industry make a worthwhile contribution to the national economy; that the industry have significant employment value; that industries be efficient, in that once the period of infancy has expired foreign competition can be met with a reduced measure of protection; and that the industry

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(7) S.J. Kleu, 'Industrial Policy', Chapter 4 in Economic Policy in South Africa - selected essays, ed. J.A. Lombard, Haum, Cape Town, 1972.

(8) Ibid., pp.116-117.

becomes a net earning of foreign exchange. In view of these wider issues, one can challenge whether tariff protection as evidenced by these various studies was adequate and efficient in meeting these criteria, in the light of changed domestic economic circumstances. Some of the above-mentioned results tend to suggest that such policy had little influence in furthering import substitution to more intermediate stages, that certain industries tended to become inefficient behind protective barriers, and because of low levels of protection accorded to capital goods and certain intermediate products, large scale importation of these was encouraged.

7.3 The expansion of exports from South Africa

Export expansion can be expressed in a number of ways. The most popularly used measure expresses total exports as a proportion of Gross Domestic Product. The problems inherent in using such a measure are that frequently traditional exports dominate the total figure and there is too much aggregation. With regard to the latter it is not possible to specify those sectors in which exports are expanding.

A better measure of changes in exports per sector between two periods of time 0 and 1 involves the use of comparing the absolute change in exports for each sector, with the change in production. Thus one can see how much of the increase in production was exported. This is summarized by the expression:

$$\Delta\alpha = \frac{X_1 - X_o}{Q_1 - Q_o}$$

where X refers to absolute exports and Q absolute levels of production in the two periods of time. Figures using this method are presented in Table 7.3. This is based on input-output statistics for 1967 and figures

TABLE 7.3.

Export expansion expressed as a proportion of the change in output for South Africa 1967-1973	$\frac{\Delta X}{\Delta Q}$ (%)
1. Agriculture, forestry and fishing	30,6
2. Gold and uranium ore mining	97,6
3. Coal mining	1,3
4. Other mining	42,2
5. Meat, dairy products and fish processing	19,5
6. Grain, sugar and animal feeds processing	
7. Other food processing	
8. Beverage industries	2,0
9. Tobacco products	
10. Wool scouring, cotton ginning and dyeing of wool and cotton	
11. Spinning, weaving, knitting and finishing of textiles	6,3
12. Clothing	6,5
13. Leather and leather products	- 83,3
14. Footwear	0
15. Wood and wood products	4,3
16. Furniture	0
17. Pulp, paper and paper board	34,0
18. Paper containers	2,0
19. Other pulp, paper and paper board articles	6,3
20. Printing and publishing	- 0,5
21. Fertilizers and pesticides	27,9
22. Synthetic resins, plastic materials and man-made fibres	41,1
23. Other basic chemicals and petroleum and coal products	10,8
24. Medicinal and pharmaceutical preparation	11,3
25. Soap and cleaning compounds and other toilet preparations	0
26. Paint and other chemical products	5,6
27. Rubber products	0
28. Other plastic products	3,9
29. Glass and glass products	5,6
30. Other non-metallic mineral products	,5
31. Iron and steel basic industries	,1
32. Non-ferrous metal basic industries	- 8,0
33. Structural metal products	2,6
34. Other fabricated metal products	4,8
35. Agricultural machinery and equipment	14,1
36. Other machinery, except electrical machinery	26,4
37. Electrical machinery, apparatus and supplies	8,1
38. Radio and television equipment	4,4
39. Motor vehicles	- 0,1
40. Motor vehicle parts	9,1
41. Railway equipment	1,9
42. Other transport equipment	19,0
43. Other manufacturing industries	75,4
44. Electricity, gas and steam	
45. Water supply	
46. Building construction	
47. Civil engineering and other construction	
48. Wholesale and retail trade and motor trade	
49. Motor repair services	
50. Transport, storage and communication	
51. Other services	
52. Goods and services not classified by destination	

from the Economic Development Programme (1974-1979). On the basis of these figures, substantial volumes of output were exported in the following sectors: agriculture, forestry and fishing (30,6 per cent), gold (97,6 per cent), other mining (42,2 per cent), meat, grain and other food (19,5 per cent), fertilizers and pesticides (27,9 per cent), synthetic resins (41,1 per cent), iron and steel (22,1 per cent), other machinery (26,4 per cent) and other manufacturing industries (75,4 per cent).

It is significant that where comparable with the Holden and du Plessis estimates for effective protection, several of these sectors are negatively protected. In other words, despite being taxed indirectly, these sectors managed to effect substantial increases in exports. The question which automatically comes to mind is whether, in the absence of implicit taxation, exports of these could not have been increased. It can perhaps be argued that these indirect taxes could have induced a cost-raising element in several of these commodities, thus rendering them less competitive than otherwise may have been the case.

These sectors, based as they are on agriculture and mining, can be considered to represent sectors in which South Africa exhibits substantial comparative advantages. The pattern of export expansion in some of the categories of manufacturing industries is, however, disturbing. Some of the effects of high levels of effective tariff protection in certain sectors such as leather and products, footwear, beverages and tobacco, printing and publishing, rubber products, soap, furniture, and motor vehicles is well reflected by the lack of increase in exports. While exports from these sectors are difficult in terms of the protective structures of more developed countries, in that these represent the type of industries that more developed countries tend to protect more heavily, it is more than coincidence that such sectors are heavily protected.

The results of the aforementioned analyses of imports and exports tend to confirm several of the predictions of the theory of effective protection. It is apparent from the estimates of effective protection for the South African economy during the mid-fifties and mid-sixties and the behaviour of imports and exports in a later period, that the pattern of protection was such as to discourage further import substitution in the sense that the process was not extended substantially beyond the final goods stage, while the continuing protection accorded to final consumer goods industries in itself tended to retard export development. Despite negative effective tariff protection, some sectors did manage to effect substantial increases in exports. These sectors, which are almost entirely based on primary activities are sectors in which the country exhibits genuine comparative advantage. As far as the performance of exports from the various sectors of manufacturing industry are concerned, these have performed poorly. The high levels of effective tariff protection accorded to many of these sectors are not conducive to increasing exports. The levels of tariff protection in these industries serve to orientate production solely for the local market. From the behaviour of imports in some of these sectors however, it is apparent that many industries cannot compete with foreign-produced goods, despite high levels of protection on the domestic market.

In view of the conclusions of the Reynders Report regarding the need to increase exports from the manufacturing sector as a long-term solution to the balance of payments problem of the country, there appears an inconsistency in this policy recommendation in that, given the type of protective structure evident in South Africa, if several sectors of industry cannot compete successfully on a domestic front, how are they to export to highly competitive export markets?

7.4 The possibilites for further import substitution in South Africa

The analysis of further import substitution as a development strategy for South Africa is discussed with reference to the almost universal failure of such a strategy in several developing countries(9). Because the longer-term experiences of these developing countries have shown the limitations inherent in this type of industrialization, one could pose the question whether failure applies to import substitution in general, or a specific type of substitution. Many of the criticisms discussed previously(10) refer to a badly-conceived import substitution, rather than the concept in general. The most serious objection that can be levelled at the kind of substitution practised in many countries is that no incentives are provided to explore backward linkage effects and extend the process to more intermediate levels. As has been suggested in this chapter, the type of tariff policy evident in South Africa serves only to intensify the problem.

On the basis of the redefined measures of imports and total supply that incorporate indirect or implicit imports one can obtain, for any given moment in time, a better measure of the potential for import substitution than is the case with the conventional measure. In comparing the $\frac{M^*}{Z^*}$ ratios for each industry with the $\frac{M}{Z}$ ratios, if there exists a large difference between the two, in that the redefined ratio exceeds the conventional ratio, this implies that the extension of the process in other sectors would increase the intermediate demand for production from that industry. Thus instead of concluding that the import substitution process is exhausted or limited to certain types of capital goods, there may be considerable opportunity for further replacement, if the concept is redefined to incorporate the input-output relationship.

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(9) The latter point was dealt with at length in Chapter 5.

(10) op. cit.

TABLE 7.4

Conventional and redefined measures of imports expressed as a proportion of total supply, 1967 and 1973	$\frac{M_{67}}{Z_{67}}$	$\frac{M^*_{67}}{Z^*_{67}}$	$\frac{M_{73}}{Z_{73}}$	$\frac{M^*_{73}}{Z^*_{73}}$
1. Agriculture, forestry and fishing	5,46	12,90	4,48	14,63
2. Gold and uranium ore mining	-	0,80	-	0,70
3. Coal mining	-	25,7	-	23,6
4. Other mining	22,24	34,1	21,65	32,7
5. Meat, dairy products and fish processing	4,59	8,0	4,86	8,7
6. Grain, sugar and animal feeds processing	6,98	6,0	5,93	11,2
7. Other food processing	7,63	10,19	5,05	7,9
8. Beverage industries	2,72	8,4	3,0	8,4
9. Tobacco products	7,57	7,6	6,60	6,7
10. Wool scouring, cotton ginning and dyeing of wool and cotton	21,53	41,5	32,0	50,3
11. Spinning, weaving, knitting and finishing of textiles	35,00	46,8	24,64	38,2
12. Clothing	8,40	9,5	13,10	14,2
13. Leather and leather products	24,03	29,0	27,61	33,2
14. Footwear	4,34	4,7	11,00	11,4
15. Wood and wood products	19,80	35,1	21,94	37,5
16. Furniture	2,58	4,5	2,77	4,8
17. Pulp, paper and paper board	33,22	49,3	31,15	47,7
18. Paper containers	0,47	18,2	0,46	18,6
19. Other pulp, paper and paper board articles	3,50	23,3	11,53	31,9
20. Printing and publishing	17,44	29,7	19,60	25,1
21. Fertilizers and pesticides	8,1	17,7	9,0	19,8
22. Synthetic resins, plastic materials and man-made fibres	61,87	76,4	75,49	83,0
23. Other basic chemicals and petroleum and coal products	33,30	50,5	17,48	39,0
24. Medicinal and pharmaceutical preparation	21,24	26,6	29,36	25,4
25. Soap and cleaning compounds and other toilet preparations	5,16	13,4	7,25	17,9
26. Paint and other chemical products	18,03	30,1	29,71	37,4
27. Rubber products	9,42	22,6	8,51	22,9
28. Other plastic products	1,10	14,8	18,69	28,5
29. Glass and glass products	27,17	35,5	22,14	30,4
30. Other non-metallic mineral products	3,82	12,0	5,9	13,14
31. Iron and steel basic industries	12,49	43,5	11,76	42,9
32. Non-ferrous metal basic industries	9,48	49,6	7,28	52,0
33. Structural metal products	-	-	-	-
34. Other fabricated metal products	18,58	31,5	10,13	24,8
35. Agricultural machinery and equipment	49,14	52,6	55,73	58,9
36. Other machinery, except electrical machinery	53,40	64,0	63,03	71,9
37. Electrical machinery, apparatus and supplies	35,01	46,2	43,03	54,0
38. Radio and television equipment	31,85	44,3	33,42	67,8
39. Motor vehicles	19,46	19,5	18,70	18,7
40. Motor vehicle parts	77,41	83,3	84,30	88,1
41. Railway equipment	6,45	9,5	19,12	21,3
42. Other transport equipment	54,94	61,6	65,69	72,6
43. Other manufacturing industries	46,08	50,0	41,73	45,3
44. Electricity, gas and steam	-	18,3	-	16,4
45. Water supply	-	15,0	-	13,9
46. Building construction	0,16	1,1	-	0,9
47. Civil engineering and other construction	-	-	-	-
48. Wholesale and retail trade and motor trade	-	6,7	-	6,
49. Motor repair services	-	15,6	-	15,3
50. Transport, storage and communication	6,45	18,4	9,7	20,4
51. Other services	2,30	14,8	4,5	13,3
52. Goods and services not classified by destination	-	-	-	-

Table 7.4 shows the results of this exercise for the South African economy for the years 1967 and 1973. In both cases there are significant differences with regard to M and M^*. The most appreciable differences are found in coal mining, wool-scouring, spinning and weaving, paper containers, pulp and paper, printing and publishing, other basic chemicals, rubber products, other plastic products, iron and steel, non-ferrous basic metals, electrical machinery, appliances and supplies, radio and television equipment, electricity gas and steam, water supply and transport. It is interesting to note that under the redefined measure of imports, substitution can be thought of as extending beyond its narrow interpretation, i.e. confining it to industry only. There exist opportunities for substitution in agriculture, mining and services as well. The figures are illuminating in that they indicate that South Africa still imports in an indirect or implicit form a large volume of goods and services that could be substituted by domestic output were such a strategy to be pursued vigorously.

The range of industries where such possibilities remain is extremely diverse. The greatest potential appears to rest in the substitution of heavy intermediate goods, which would involve the increased usage of coal and iron and steel. However, considerable potential is apparent in a number of higher intermediate sectors, which do not require vast capital outlays and could utilize labour relatively intensively. Moreover, because several of these industries, such as paper containers, paper and pulp, washing and spinning of wool and cotton, wood and products, are not dependent on the size of the local market as other final goods industries are, such industries could be located in various homeland areas, and possibly these could help bring about more balanced regional development in South Africa. The generative effects on the demand for labour in these areas may be enormous.

Rather than conclude as various other studies of the South African economy have done, that the potential for further import replacement is limited largely to heavy intermediate and capital goods industries (11), there appears considerable potential for the extension of import replacement to light intermediate goods and even raw material industries, if import substitution is interpreted in a more dynamic manner.

7. Tariff policy for growth and development in South Africa

Granted that the potential for import substitution in South Africa is still considerable and given the need for increasing export earnings in the light of recent problems connected with the balance of payments, an ideal tariff policy is required that would foster development in both these directions. There is no need for the strategies of import substitution and export expansion to conflict with one another. In the case of a badly-implemented import substitution policy such conflict would arise. A tariff policy of a kind which appears to have been pursued in South Africa has retarded development in both inward-and outward-oriented sectors and thus can be considered to a certain extent responsible for some of the deficits on the current account of the balance of payments.

Although tariff policy in South Africa during the earlier years had a marked effect on the pattern of economic development in the country and contributed substantially to economic growth, such policy was not adapted during the 'fifties and 'sixties to conform to the structural change that had resulted from economic growth. In this regard a drastic revision of tariff policy is required. More encouragement should be granted to the domestic production of intermediate and capital goods of the type mentioned above. While on an effective basis, this would reduce the overall level of

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(11) See e.g. S.F. Scheepers, The Effect of Import Substitution on the Volume and Structure of South Africa's Imports 1926/27-1963/64, in Finance and Trade Review, Vol. viii (4) Dec. 1969
The Reynders Commission also refers to this conclusion, op. cit., p.29.

protection in final goods industries, the reduction in protection at these final stages of production can be beneficial to the economy in that it would force these producers to become more efficient and possibly look to export markets in an endeavour to achieve market economies of scale.

It may be argued that the effects of such a policy of stimulating the domestic production of intermediate goods and further pursuing import substitution may be inflationary and costly to export-oriented industries to the extent that costs of intermediate goods will increase. However, the inflationary effects may be counteracted by increased productivity, efficiency and economies of scale that would result from this strategy. Furthermore, by increasing tariffs on goods of a capital nature, more labour intensive techniques might be implemented in South Africa. Perhaps South Africa might then develop a type of technology in production which would reflect the country's comparative advantage in those goods that incorporate one of its most abundant factors - labour. This latter assertion presupposes relaxation of restrictive labour legislation.

Another prerequisite of improved tariff policy is that the industries enjoying high levels of protection be placed under constant surveillance, to ensure that such industries do not become inefficient behind a wall of protection. Admittedly, it is impossible for tariff-making authorities to foresee in advance the type of industry that would comprise a genuine infant. Once protection is levied, there is no reason why such protection should become permanent. In this connection, the performance of several industries in South Africa that have enjoyed high levels of protection since the inception of a deliberate industrialization policy is disturbing. If 'infants' fail to mature, permanent protection of these industries is costly.

7.6 Summary and Conclusions

In Chapter 1 it was shown how, over time, both the nature and form of state intervention have increased in response to different economic conditions. Furthermore, the growth of such intervention has in itself influenced and contributed to a change in economic conditions. In response to these, a need has arisen in the study of policy and intervention, for a substantial revision of some of the traditional theories of Economics. The contribution that Economics can make in the study of policy is important. It aids one in assessing the consistency of various aims and objectives of intervention and it increases one's awareness of the nature and effects of alternative forms of policy.

The Great Depression represents a point of departure in both the theory and practice of state intervention. While the Keynesian revolution stressed the important influence of Government on certain macro-economic variables such as employment, consumption, investment and national income, the Depression highlighted the need for Governments to diversify economic activity by industrialization. In order to achieve these, Governments realized the importance of other means, besides increased government expenditure, in order to stimulate economic activity. Arguments advocating the protection of industries assumed a new rationale - protection would encourage industrial expansion, employment and economic growth. In achieving this, it was argued that an additional policy objective, such as increased stability on the balance of payments, would be attained as well.

In Chapter 2 the history of protective policy in South Africa was presented. The levying of duties for protective purposes was started in earnest in South Africa during the mid-nineteen twenties. Until the Second World War this policy was a response to the 'poor-white' problem. After the War the justification for such policy was expanded to conform to broader economic objectives. However, the earlier era of protection did serve to establish industrial diversification on a broad scale and as such can be considered as fulfilling broader economic objectives. It is significant that several early commissions of enquiry into tariff policy as well as several eminent economists had the foresight to emphasize the short sightedness of the country's protective policy. These warnings went unheeded.

Chapter 3 presented a survey of the literature on protection and international trade. Until recently, many of the theories of international trade compared tariff protection to a situation of free trade and concluded that, on the basis of the unreality of the assumptions of perfect competition that pervaded the theory of comparative advantage, protection was considered justifiable. Over the past few years, the emphasis in international trade theory has shifted towards the evaluation of various forms of protection, and the broad conclusion that has emerged is that divergences from a stage of perfect competition are considered a domestic phenomenon and any attempt to rectify these should be directed at the sources of such distortions, rather than an undertaking to correct these by intervening in international trade. To the extent that tariffs create alternative distortions, other forms of protection are considered more desirable. Despite these conclusions, tariffs are regarded by governments as optimum forms of protection. They have enormous political appeal and they yield revenue. While institutional arrangements have been intended at liberalizing tariffs, these have only served to high light the increased reliance on other trade-distorting devices that can be considered as substitutes for tariffs.

In Chapter 4 it was shown that a new development occurred in the field of international trade theory that provides a tool for the improved study of protection. The use of the concept of the effective rate of protection shifted the emphasis in studies of the effects of protection away from its effects on consumers to producers. The effective rate expresses the margin of protection on the value added in the production process, rather than the product price,as is the case with the nominal rate of protection. It is defined as the percentage excess of domestic value added that arises from the imposition of tariffs and other protective measures on the product as well as its inputs, compared to a free trade or world-market value added. Because the level of effective protection influences the decisions of producers its impact extends to the allocation of resources amongst industries. Thus the effective rate of protection represents a better analytical tool when compared to the nominal rate of protection.

The concept as such is still in a relatively early stage of development and there are at present numerous conceptual theoretical and practical problems associated with it. Despite these, the concept appears extremely useful, by virtue of its emphasis on production decisions, in explaining the pattern of economic development and the many problems experienced by various countries that have attempted to encourage industrial diversification through stimulatory policies. In Chapter 5, an attempt was made to analyse the influence of the pattern of protection on a country's structure of production. The protective structure, judging from the experiences of several developing countries, is normally such that it has tended to encourage development through import substitution, and a particular type of import substitution. It was also shown that industrial development in South Africa had taken place primarily through the stimulus of import substitution. The economy has tended to follow an inward-looking industrialization policy that has led to several structural problems that at present

appear to be inhibiting future economic growth. Although the early rationale for tariff protection in South Africa differed from other countries in that social and political factors were included in the framing of South Africa's protective policy, the experiences and structural problems resulting from these policies are not unique to South Africa. The emergence of a relatively large non-white market during the 'sixties and the high price of gold during the 'seventies only served to postpone some of these structural problems.

Chapters 6 and 7 deal with measurements of effective tariff protection and trends in imports and exports for South Africa, respectively. Despite vast structural change in the economy, it is apparent from estimates of tariff protection for this country that high levels of protection are still accorded to a large volume of consumption goods, while capital goods and a high proportion of intermediate products are allowed in the country free of duty. In turn, this has encouraged a particular type of production pattern that has been responsible for vast imports of capital equipment while exports from the manufacturing sector have been negligible. In addition, several branches of manufacturing industry appear to be hiding behind protective barriers. The protective pattern in South Africa appears to be discouraging further import substitution and restricting exports of manufactured goods.

In terms of the still considerable scope for import substitution (re-defined to incorporate the input-output relationship) and the need to increase exports of manufactured goods, it is suggested that the structure of tariff protection in South Africa be revised and that protection be used to stimulate growth and development. In the light of political unrest, growing unemployment, inflation, serious balance of payments difficulties and the emergence of independent homelands requiring a strategy for economic

viability, the need for reform has never been more urgent.

The theory of effective protection provides a logical explanation for some of the experiences and problems inherent in the South African economy. Despite the difficulties in measuring effective tariff protection for the South African economy, several of the predictions of the theory of effective protection are valid in the South African context.

It could be argued that the above analysis has only been conducted in terms of tariff protection in South Africa, and that if one were to look at other protective measures, the level of protection may well reflect a different picture. Admittedly this may be so. But it should be borne in mind that tariffs are just one form of state intervention and should future studies into some of the other trade-distorting devices such as subsidies, import quotas, rebates of duty, exchange restrictions and exemptions, etc., eliminate some of the by-product distortions of tariffs, this points to a greater need for the co-ordinated implementation of policy. At present, different institutions are responsible for implementing various types of policy, so that the policy of the Board of Trade and Industries may conflict with that of the Reserve Ba' , or the Department of Customs and Excise. It should be stressed that in order for economic policy to have much chance for success, in order for the various aims and instruments to be consistent, policy be implemented within a total framework, rather than in isolation.

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