

CHAPTER FIVE

TRADE INCENTIVES, TRADE REGIME BIAS AND SOUTH AFRICAN MANUFACTURING PRODUCTION DURING THE 1990s

5.1 Introduction

It is important to draw a distinction between policy incentives and actual trade patterns. It has been shown that in a three-sector framework, the promotion of import substituting (export) production need not be at the expense of export (import substituting) production (Liang, 1992; Pack and Westphal, 1986; Sachs, 1985; Singer and Alizadeh, 1986). This is an important development since it calls into question the conventional measure of anti-export bias, namely, that import substitution occurs at the expense of export production. Hence, the first objective of this chapter is to analyse the impact of export and import-substituting incentives accorded to the South African manufacturing sector during the 1990s within this three-sector framework. The question that informs the analysis in this regard is:

"What was the impact of trade incentives on the extent of anti-export bias in South African manufacturing during the 1990s?"

As far as actual trade patterns are concerned, it is important to realize that import substitution (substitution of domestic production for imports) can occur naturally under free trade conditions (Balassa and Associates, 1982: 49). In addition, imports may decrease because there has been a decline in domestic demand rather than an increase in domestic production. Similarly, an increase in the ratio of exports to domestic production could be as a result of a decrease in production rather than in an increase in the volume of exports produced. It is thus imperative that a critical analysis of any trade policy regime has to distinguish between intended policy incentives and the actual trade patterns that result. This would allow one to ascertain the extent to which actual trade patterns conform to the policy incentives accorded to the industries. This is the second objective of this chapter.

In this chapter the following are undertaken:

- An analysis of the impact of trade incentives on trade regime bias of the South African manufacturing sectors during the 1990s, and
- An analysis of the sectorial orientation of manufacturing production during the 1990s. The main aim here will be to ascertain if the trade patterns experienced by the different industries conformed to the trade incentives accorded to industries.

In the next section a theoretical review of trade incentives and their impact on trade regime bias is provided. Section 5.3 provides an empirical analysis of the bias of the trade regime in South Africa during the 1990s. The penultimate section provides a brief review of manufacturing production in the light of the trade regime bias identified in the previous section. Section 5.5 concludes.

5.3 Trade incentives

The general case for trade strategy as the main determinant of industrial success is based on the assumption that incentives are an important determinant of performance (Lall, 1990:119). However, it is important to recognise that while trade policy is an important element of industrial policy, other important elements include, tax policy, employment policies, competition policies, research and development (R&D), policies influencing technology transfer and growth of domestic markets.¹ The process of industrialisation is to a large extent determined by the interplay between these different elements. Trade incentives that encourage export production, for example, may not be successful if it is not complemented by policies that ensure favourable access to credit (to finance construction of production facilities) and/or policies that promote R&D activity. Technology is an important factor underpinning the gains from trade. (Posner, 1961; Hufbauer, 1966; Vernon, 1966; Krugman, 1979a).

¹ See Krueger (1978) and Bhagwati (1978) and Papageorgiou et al (1990) for an analysis of the effects of macroeconomic policies (e.g. monetary policy, fiscal policy and exchange rate) on the trade policy of selected countries. Rodriguez and Rodrik (1999) go one step further, by arguing that it may be futile to seek a relationship between trade barriers and growth, in the light of the complex inter-relationships between trade policy and other macro-economic or government policies.

Measuring trade incentives has been one of the major challenges confronting the empirical analyst. This is usually due to the non-availability of reliable statistics, which in turn is due to either deficiencies in statistical records or information being deliberately excluded from official statistics. Information could be excluded from official records in order to keep domestic lobby pressures in check and/or to prevent falling foul of WTO rules.

Trade incentives could include direct measures like tariffs, quotas and export subsidies and indirect measures like special tax incentives to promote production (as in the case of export processing zones) and expenditures on R&D and skills development. Information on imports (e.g. tariffs) and import quotas are usually more readily available and these have mainly been used in the appraisal of trade policy. These have usually been incorporated in effective protection analysis.² However, if export and import substituting incentives were simultaneously used to stimulate production, then a critical analysis of trade policy has to analyse both sets of incentives. Between 1990 and 1997, both tariff protection and export subsidies (under the General Export Incentive Scheme- GEIS) were given to sectors. Given this scenario, the issue of relevance is what effect these incentives had on bias of the trade regime during the 1990s.

Even if a realistic measure of trade incentives exists or can be derived, it is still necessary to define the criteria determining the trade policy stance. In other words, what are the level of trade incentives that bias the regime towards either export or import competing production? Krueger (1978) defines the overall stance or “bias” of trade policy as the ratio of the internal relative price of exports and imports (internal terms of trade) to the world price ratio (external terms of trade). Expressed mathematically this is given by:

² For an application to SA see, IDC (1996a) and Fedderke and Vaze (2001)

$$TB = \frac{\frac{P_x}{P_m}}{\frac{P_x^*}{P_m^*}} \dots\dots\dots(4)$$

where TB reflects the trade bias, P_x and P_m the domestic price of exports and imports and P_x^* and P_m^* world prices of exports and imports. TB will exceed one when the domestic incentive structure promotes exports, while a value less than one favours import-substituting production. The incentive structure is neutral when TB equals 1. Thus, equation (4) provides an indirect measure of the trade incentives accorded to export or import competing production.

Bhagwati (1988a; 1988b) considers export promotion to be a strategy that does not discriminate against exports. In this case, a neutral trade policy stance would qualify as export promotion.³ Given this classification scheme, an incentive structure that favours imports over exports is construed to have an anti-export bias. The effective exchange rate (EER) is used to depict the bias in the trade regime. In this case, the EER refers to the nominal exchange rate plus any trade incentives per unit of foreign currency received by domestic producers.⁴ This can be represented by the following equations:

$$EER_m = e(1 + t_m + q_m) \dots\dots\dots(5)$$

$$EER_x = e(1 - t_x + s_x) \dots\dots\dots(6)$$

Where e , t_m , q_m , s_x represent the exchange rate, the tariff rate, the quota equivalent rate and export subsidy rate respectively. In addition, t_x represents any disincentive (e.g. an export tax) against exports. The trade regime is said to be neutral if EER_x equals EER_m . The EER_x and EER_m can be calculated at

³ Where the incentive structure is biased towards export promotion, Bhagwati (1988a) classifies this as ultra-export promotion.

⁴ This differs from the usual definition of the EER where it represents the trade weighted sum of the currencies of major trading partners.

a disaggregate (industry) level, in which case a comparison between these indices would reflect the trade regime bias at the industry level.

In the 1960s and 1970s, the trade policy debate on economic development centred around protection for import substitution *vis-a-vis* export promoting activities, with the Latin American experience providing fertile ground for this debate. Since the mid-1980s it has become apparent that the main issue surrounding the path to industrialisation has not been one of either export promotion or import substitution, but the inter-relationship between and sequencing of these two strategies. The notion that protection restricts export growth is based on the two-sector (exportables and importables) model where protection of one sector is at the expense of the other sector (Greenaway and Milner, 1987; Clements and Sjaastad, 1984; World Bank, 1987). Within a two-sector model the anti-export bias measure is meant to reflect the effects of trade policy on exports relative to imports. In this case, the anti-export bias measure is given by:

$$AEB = \frac{(1 + ERP)}{(1 + XPR)} \dots\dots\dots(7)$$

where,

AEB = anti export bias

$\frac{VA_d - VA_w}{(VA_w)}$ = effective rate of protection (ERP)

$\frac{VA_w - VA_d}{(VA_d)}$ = export protection rate (XPR)

VA_d = value added under protection

VA_w = value added under free trade

According to equation (7), if AEB exceeds 1 then there is a bias against export production. Since equation (7) is based on a two-sector framework, any import substituting incentives is at the expense of export production, thus implying an anti-export bias in the trade regime. This can be proven quite easily as follows. If one assumes that for a given sector VA_w equals 10 percent and VA_d equals 20 percent, then ERP totals 100 percent

$[\frac{(20-10)}{10} * 100]$ while under the same scenario XPR equals -50 percent

$[\frac{(10-20)}{20} * 100]$ thus implying an anti export bias since the *AEB* exceeds unity

$[\frac{(1+1)}{(1-0.5)} * 100]$.

However, in a three sector model, even with full employment, import-substituting policies can complement export promoting policies as resources are drawn from non-tradables into both the tradables sectors (Sachs, 1985; Singer and Alizadeh, 1986; Pack and Westphal, 1986). Liang (1992) has shown that in a three-sector model (exportables, importables and non-tradeables), export promotion and import substitution need not be mutually exclusive policies. In this case, production of tradeables is a function of two relative prices, that is:

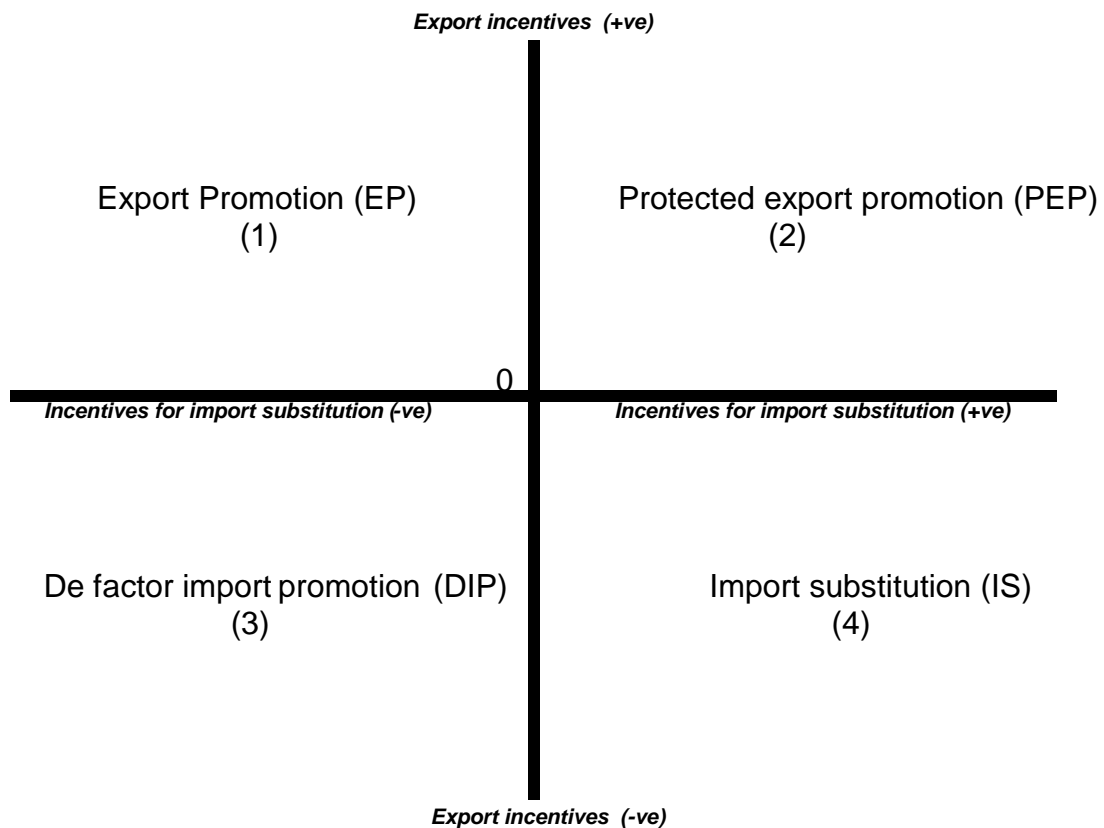
$$X = f\left(\frac{P_m}{P_n}; \frac{P_x}{P_n}\right) \dots\dots\dots(8)$$

$$M = f\left(\frac{P_m}{P_n}; \frac{P_x}{P_n}\right) \dots\dots\dots(9)$$

An increase (decrease) in the price of exportables (P_x) results in an increase (decrease) in the production of exportables. However, the increase (decrease) is not necessarily at the expense (advantage) of the import substituting sector. This is because the increase in the production of tradeables (exportables, importables) can be facilitated through a shift of resources from the non-tradeables to the tradeables sector. Using this three-sector framework it is possible to identify five distinct trade incentive patterns as reflected in figure 2.⁵

⁵ For a formal elegant exposition see Liang (1992).

Figure 2: Trade incentives and regime bias



Source: LIANG, N. 1992. Beyond import substitution and export promotion: A new typology of trade strategies. *Journal of Development Studies*, Vol. 28, p 452.

- Quadrant 1 reflects a “pure” export promoting strategy (EP) where export incentives are positive and negative protection (disincentives) for import substituting activities.
- In quadrant 2 there are incentives for both export activities and import substituting activities. Liang (1992) terms this “protective export promotion” (PEP). In this case, protection is accorded for the domestic market whilst firms are simultaneously encouraged to export.⁶

⁶ This corresponds with South Korea's export experience where incentives for both export and import substituting activities were simultaneously provided. (Pack and Westphal, 1986; Suh, 1975).

- Quadrant 3 depicts a situation where disincentives exist for both exportables and import substitutes. Imports and non-tradables are being favoured.⁷
- Quadrant 4 depicts “import substitution” (IS) where there are incentives for import substitutes and disincentives for exportables.
- A neutral trade policy stance is one where neither exportables nor import substitutes receive any incentives. This is captured at the point of intersection of the two axes.

Thus, within a three-sector framework, free trade is but one of a range of export-fostering policy regimes. The simultaneous protection of both the exportables and importables sector is not incompatible with export promotion. Wade (1990) and Amsden (1989) have argued that the East Asian experience has shown that import protection was necessary to secure export production.⁸ The implication of this is that it calls into question the conventional interpretation that a greater incentive to produce for the domestic market is a bias against export production. In terms of figure 2 above, only quadrants 3 and 4 reflect a bias against export. Quadrant 2, although having incentives for import-substitution, does not reflect an anti-export bias since there are incentives for export production. This is the fundamental point that emerges from an analysis within a three sector framework - import substitution need not be at the expense of export promotion.

However, Milner (1995) has illustrated that the simultaneous promotion of exportables and importables may not necessarily produce a pro-tradeable bias. The net effects depend on the nature and magnitude of the substitution, complementarity and income effects of the exportables, importables and non-tradable sectors.⁹ In addition, the existence of imperfect competition may result in policy measures not matching production outcomes. Since actual outcomes may differ from policy intentions, Liang's (1992) trade incentive

⁷ Liang (1992: 454) only emphasizes the promotion of imports but not the promotion of non-tradables in this quadrant.

⁸ Krugman (1994) has shown that under conditions of imperfect competition import protection is not only compatible with, but may also be necessary for export production.

⁹ For the proof of this see Milner (1995).

classifications may have limitations as an ex-ante tool of policy formulation. However, it provides a useful tool allowing one to at least measure the bias of the trade regime ex-post.¹⁰

Following the general equilibrium framework developed by Sjaastad (1980) and Greenaway and Milner (1987), incidence analysis has also been used to analyse the effects of protection. In a three-sector model, “...an examination of how an import tariff alters the price of importables relative to exportables and non-tradables can provide an indication of the “true” protection of importables and the extent to which the incidence of the tax is shifted onto exportables and non-tradables. The incidence depends essentially on the degree of substitutability (in demand and production) between the products of the importables sector and the other unprotected sectors” (Greenaway, 1989: 127). The incidence measure is depicted by the variable “ w ” in the following formula:

$$\log\left(\frac{P_n}{P_x}\right) = c + w \log\left(\frac{P_m}{P_x}\right) + u \dots\dots\dots(10)^{11}$$

where u is the stochastic disturbance term. In this case w estimates the proportion of import protection that is shifted in the form of an implicit export tax. Where importables and non-tradeables are substitutes, w tends towards unity. On the other hand, w tends towards zero if exportables and non-tradeables are substitutes for each other.

Another model which unfortunately has strong data requirements, is the trade restrictive index (*TRI*) proposed by Anderson and Neary (1996). The *TRI* uses a CGE model to derive the uniform tariff, which has the same static welfare effect as the structure of tariffs and quotas actually in place. Similarly, a trade subsidisation index can be constructed to capture the effects of export

¹⁰ This could have been either intended or unintended. One way of analysing the impact of trade incentives is to consider its effects on prices. This is the focus of chapters six and seven.
¹¹ For a formal proof see Milner (1995) and Greenaway (1989).

subsidies.¹² The data requirements for the calculation of the trade restrictive index preclude its use in the case of SA. In addition, O'Rourke (1997) has shown that the index is sensitive to changes in the specification of the model and demand elasticities used in the estimation of the model.

5.2 Trade regime bias

As in the case of Balassa and Associates (1982), the effective rate of protection is used to reflect the trade incentives accorded to import substituting activities. This is termed the net effective subsidy rate on imports. The net effective subsidy rate on exports captures the combined effects of protective measures and export incentives on export production. In the calculation of export incentives, due consideration was given to the export subsidies under the General Export Incentive Scheme (GEIS), import rebates (article 470.03) and the tariffs paid on intermediate inputs. Due to data constraints transport rebates, or interest rate concessions that may have been accorded to some industries during the period under analysis were not considered.¹³

Figures 3 and 4 present the trade regime bias for different industries for the period 1990-94 and 1995-97.¹⁴ As in Liang (1992), a cut off point of 5 percent is used to define the free trade region.¹⁵ If an industry's incentive measure is within 5 percentage points from the intersection of the axis, then the industry is defined as following a free trade strategy. The sectors are represented by numbers (see table 8); only those sectors that were not subjected to a free trade strategy are explicitly reflected in figures 3 and 4. All those sectors that are not explicitly reflected in figures 3 and 4 are contained in the free trade region.

¹² see Anderson and Neary (1996).

¹³ For a detailed description of how the trade incentive bias can be measured see Balassa and Associates (1982: Appendix 1).

¹⁴ The GEIS began in 1990 and ended in 1997 and there were no general export incentive scheme available after 1997. Since 1995 represented the beginning of SA's tariff liberalisation programme, the analysis is divided between the two periods 1990-94 and 1995-97.

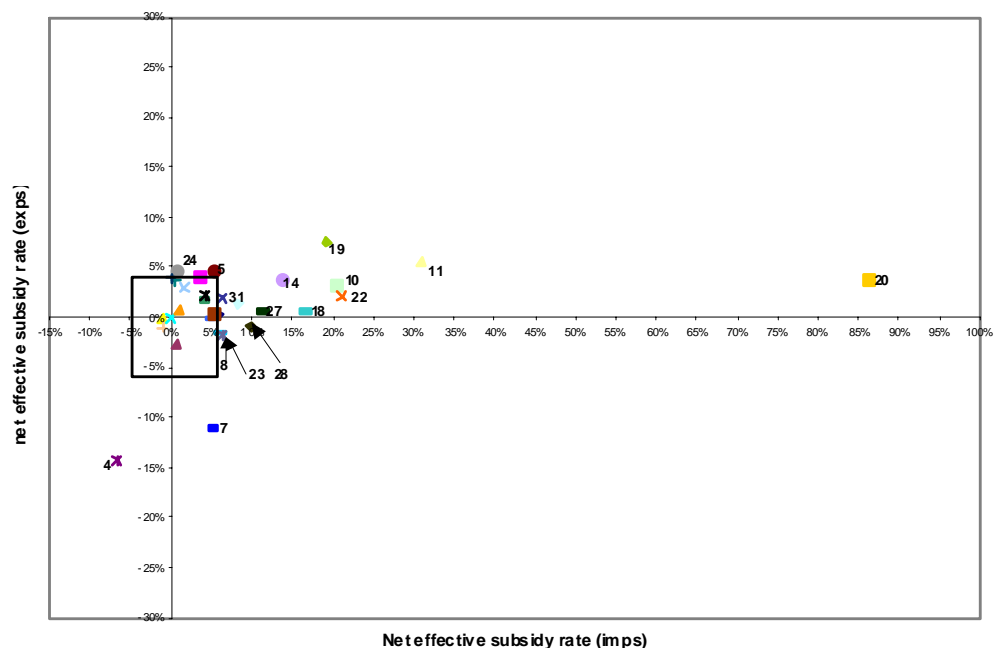
¹⁵ This is a subjective benchmark and as such influences the number of industries that are classified as having a free trade regime bias.

Table 8: Sectors reflected in figures 4 and 5

1	Agriculture, forestry and fishing	17	Other chem & Man fibres
2	Coal mining	18	Rubber
3	Gold and uranium ore mining	19	Plastic prod
4	Other mining	20	Glass and glass product
5	Food	21	Non metallic minerals
6	Beverages	22	Basic Iron and Steel
7	Tobacco	23	Basic non ferrous met
8	Textiles	24	Metal prod excl machinery
9	Wearing apparel	25	Machinery & Equip
10	Leather	26	Electrical machinery
11	Footwear	27	TV radio and equip
12	Wood and wood prod	28	Professional and scientific
13	Paper and Paper Prod	29	Motor vehicles Parts
14	Print, pub and recording	30	Other transport
15	Coke and ref petrol	31	Furniture
16	Basic Chemicals	32	Other industries

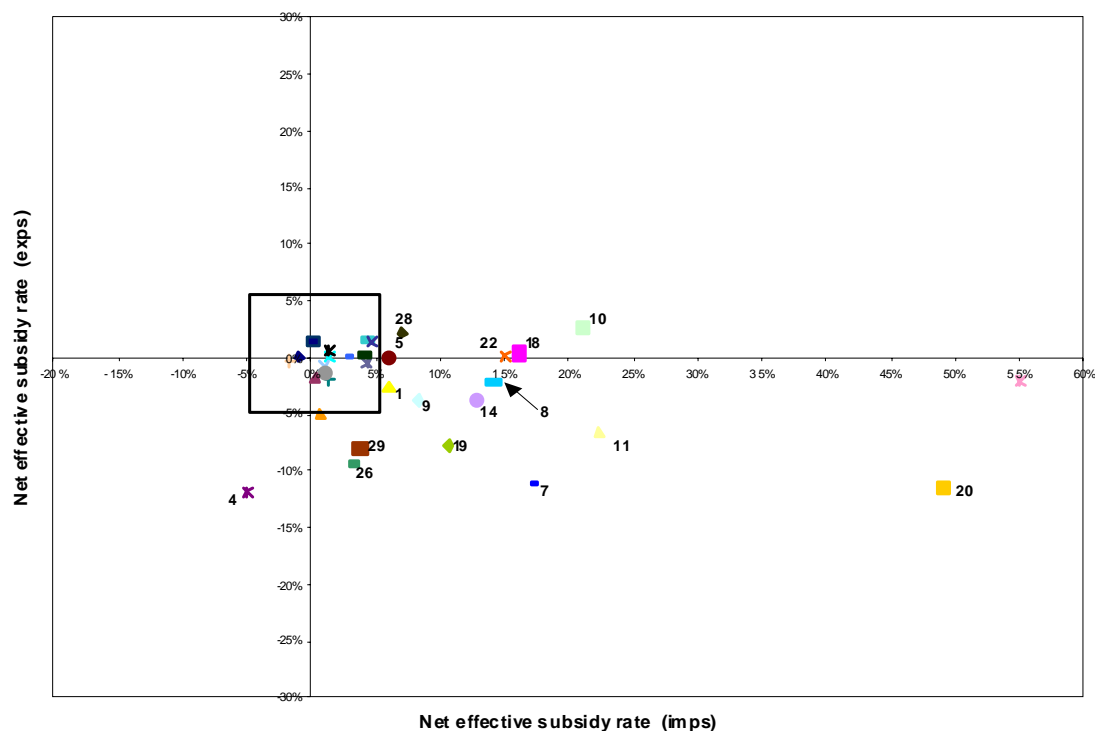
Source: Own tabulation

Figure 3: Trade incentive classification (1990-94)



Source: Own calculations with data from the Department of Trade and Industry.

Figure 4: Trade incentive classification (1995-97)



Source: Own calculations with data from the Department of Trade and Industry.

During both periods, there were sixteen sectors that fell outside the free trade region. For the period 1990-94, eleven sectors (metal products; food; furniture; TV, radio and communication; printing and publishing; plastic products; rubber products; leather and leather products; basic iron and steel; footwear; glass and glass products) enjoyed both export promotion and import substituting incentives. In terms of the classification used by Liang (1992), these eleven industries were subjected to a "protected export promotion" (PEP) incentive structure.¹⁶ Four sectors (textiles; basic non ferrous metals; professional scientific equipment; tobacco) were given incentives (disincentives) for import substitution (export production); this is classified as an import-substituting trade strategy. There were disincentives for both export production and import substituting activities for the "other mining" sector - this is classified as "duly import promotion" (DIP) - this is not surprising since

¹⁶ This is not surprising given that both export subsidies and tariff protection were the two main trade policy instruments during this period.

"other mining" mainly includes oil imports. Thus, during the period 1990-94, only five sectors (textiles; basic non ferrous metals; professional scientific equipment; tobacco and other mining) had a trade policy bias against exports.

During the period 1995-97, export incentives (GEIS) were being phased out and it is thus not surprising that only five sectors (professional and scientific equipment; food; basic iron and steel; rubber products; leather and leather products) enjoyed "protected export promotion". There was an increase in the number of sectors with an import-substituting trade policy bias. This included the following industries; electric machinery and apparatus; motor vehicles and parts; agriculture; wearing apparel; plastic products; printing and publishing; textiles; tobacco; footwear; glass and glass products. Imports were still being encouraged for the "other mining" sector during this period.

Comparing the two periods, the following emerges:

- Of the 12 sectors that are common in both periods, the incentive scheme is unchanged for four "PEP" sectors (food; leather and leather products; rubber products; basic iron and steel), one "DIP" sector (other mining) and two import-substituting sectors (tobacco; textiles). Of the remaining sectors, four (footwear; printing and publishing; plastic products; glass and glass products) moved from enjoying both export and import substituting incentives during 1990-94 ("protected export promotion") to a situation where they were accorded only incentives for import substitution and disincentives for export production ("import-substitution"). The professional and scientific equipment sector moved from a situation of only having incentives (disincentives) for import substitution (export promotion) during 1990-94 to enjoying incentives for both export and import substituting activities during 1995-97.
- Four sectors (basic non-ferrous metals; metal products excluding machinery; TV, radio and communication; furniture) moved from enjoying some level of incentives for import substitution (e.g. basic non-ferrous metals) and some level of incentives for both export and import substituting activities (e.g. metal products excluding machinery;

TV, radio and communication; furniture) during the period 1990-94 to a free trade regime bias during 1995-97. In addition four sectors (agriculture; wearing apparel; electrical machinery; motor vehicle and parts) moved from a free trade regime bias during 1990-94 to an import-substituting bias during 1995-97.

- There was an increase in the number of sectors subjected to an import-substituting trade regime bias from four (1990-94) to ten (1995-97). In essence, it is these 10 sectors together with the other mining sector (4) that had an anti-export trade policy bias during the period 1995-97.

The significance of the last point should not be over-estimated. It has been claimed that South Africa's trade policy has been characterised by a high level of anti-export bias (IDC, 1996a; Tsikata, 1999). In terms of the calculations undertaken within the two-sector framework, by the IDC (1996a), the sectors subjected to an anti-export trade policy bias accounted for 80 percent (87 percent) of total output in 1990 (1999).¹⁷ However, in terms of classifications reflected in figures 3 and 4, the sectors subjected to an anti-export bias accounted for 13 percent (27 percent) of total output in 1990 (1999).¹⁸ Thus, while the anti-export bias in trade policy increased during the latter part of the 1990s with the phasing out of export incentives, the extent of anti-export bias prevailing during the early to mid 1990s has been exaggerated.¹⁹

5.4 Sectorial orientation of manufacturing production

The objective in the remainder of this chapter is to ascertain how the production of the different sectors related to the trade policy bias identified in the previous section. Considering first the classification of sectors according to their production structure. The classification of export and import sectors is not as straightforward as might be first assumed. Sectors could be producing more than one product (sometimes referred to as multi-product sectors) with

¹⁷ The anti-export bias calculations for 1993 were used to determine the contribution for the year 1990.

¹⁸ The sectoral classification identified in figure 3 (figure 4) were used to determine the sectoral output in 1990 (1999). The data used in the calculations was sourced from TIPS.

¹⁹ See Belli et al (1993), World Bank (1994), Tsikata (1999).

some products specifically targeted for the domestic market while others may be targeted for the international market. In addition, the economic literature has shown that, *inter-alia*, product differentiation and transport costs could result in intra-industry trade. Hence, the issue to bear in mind is that even if the policy objective is to target export sectors, it may not be always easy and straightforward to identify export industries.

Trade theory suggests that factor intensities could be used to classify sectors - the conventional wisdom being that export sectors would conform to factor endowments.²⁰ However, the *Leontief paradox* and new trade theory has called into question the notion that comparative advantage is based solely on factor endowments. Actual trade patterns (for example, net trade balances) could also be used to classify sectors (Milner and McKay, 1996).²¹ Alternatively, the classification could be based on import and export shares (Balassa and Associates, 1982). In this case, the following four categories could be identified:

- Export industries (EP): industries where more than 10 percent of domestic production is exported but imports account for less than 10 percent of domestic consumption.
- Import-competing industries (IC): where less than 10 percent of domestic production is exported but imports account for more than 10 percent of domestic consumption.
- Export and import-competing industries (E, I): where exports and imports account for more than 10 percent of domestic production and consumption respectively.
- Non-tradables (NT): industries where exports and imports account for less than 10 percent of domestic production and consumption respectively.

²⁰ In some respects the measure captures the potential of the industry based on its factor content. However, it could be the case that the industry's existence could be due to protection in which case an ex-post protection classification would not necessarily imply a similar factor use as would be the case without protection.

²¹ Another alternative would be to use revealed comparative advantage calculations in the classification of sectors. However, the classification would not differ significantly from those using net exports.

The above classification, while sensitive to the benchmark (which is chosen arbitrarily) relates very closely to the definitions of import substitution and export promotion used in the empirical literature. Based on the criteria mentioned above, table 9 reflects the classification for the sectors of the South African economy.

Table 9: Classification of sectors (export promoting, import substituting, non-tradables)

Sectors (SIC)	Exports/production		Imports/consumption		Classification	
	1990-94	1995-2001	1990-94	1995-2001	1990-94	1995-2001
Agriculture, forestry and fishing [1]	13	15	7	7	E	E
Coal mining [21]	43	45	2	4	E	E
Gold and uranium ore mining [23]	99	99	0	0	E	E
Other mining [22/24/25/29]	94	75	91	65	E,I	E,I
Food [301-304]	8	10	5	10	NT	E,I
Beverages [305]	4	11	3	5	NT	E
Tobacco [306]	3	11	2	2	NT	E
Textiles [311-312]	12	16	20	26	E,I	E,I
Wearing apparel [313-315]	6	10	7	12	NT	E,I
Leather and leather products [316]	20	36	23	31	E,I	E,I
Footwear [317]	2	4	11	31	IC	IC
Wood and wood products [321-322]	9	13	10	12	IC	E,I
Paper and paper products [323]	17	23	11	14	E,I	E,I
Printing, publishing and recorded media [324-326]	1	2	16	20	IC	IC
Coke and refined petroleum products [331-333]	15	21	7	12	E	E,I
Basic chemicals [334]	29	44	39	48	E,I	E,I
Other chemicals and man-made fibers [335-336]	4	13	18	28	IC	E,I
Rubber products [337]	6	18	17	30	IC	E,I
Plastic products [338]	2	6	8	12	NT	IC
Glass and glass products [341]	9	14	15	24	IC	E,I
Non-metallic minerals [342]	4	8	8	16	NT	IC
Basic iron and steel [351]	44	52	9	13	E	E,I
Basic non-ferrous metals [352]	54	59	20	34	E,I	E,I
Metal products excluding machinery [353-355]	7	14	9	13	NT	E,I
Machinery and equipment [356-359]	12	45	49	72	E,I	E,I
Electrical machinery and apparatus [361-366]	5	14	25	33	IC	E,I
Television, radio and communication equipment [371-3]	6	30	44	79	IC	E,I
Professional and scientific equipment [374-376]	23	62	76	89	E,I	E,I
Motor vehicles, parts and accessories [381-383]	8	15	26	33	IC	E,I
Other transport equipment [384-387]	15	66	51	82	E,I	E,I
Furniture [391]	7	35	3	11	NT	E,I
Other manufacturing [392-393]	27	40	44	55	E,I	E,I
Electricity, gas and steam [41]	1	1	0	0	NT	NT
Water supply [42]	0	0	0	0	NT	NT
Building construction [51]	0	0	0	0	NT	NT
Civil engineering and other construction [52-53]	0	0	0	1	NT	NT
Wholesale and retail trade [61-63]	4	5	0	0	NT	NT
Catering and accommodation services [64]	10	12	10	12	E,I	E,I
Transport and storage [71-74]	10	12	8	9	E	E
Communication [75]	5	4	6	5	NT	NT
Finance and insurance [81-82]	3	5	2	2	NT	NT
Business services [83-88]	2	2	2	2	NT	NT
Medical, dental and veterinary services [93]	1	1	1	1	NT	NT
Services excl medical, dental and vet services [94-96]	2	2	4	3	NT	NT
Other producers [98]	1	1	7	8	NT	NT
General government services [99]	0	0	0	0	NT	NT

Source: Own calculations with data from TIPS

During the pre-liberalisation period, the production of six (nine) sectors was solely oriented towards export (import competing) production. The export sectors were made up of three primary commodity sectors (namely, agriculture, forestry and fishing; coal mining; gold and uranium ore mining), two manufacturing sectors (namely, coke and refined petroleum and basic iron and steel) and one service sector (namely, transport and storage industries). The import substituting industries were all from the manufacturing sector and included footwear; wood and wood product; printing and publishing; other chemicals, rubber products; glass and glass products; electrical machinery; TV, radio and communication and motor vehicle parts and accessories industries.

The production of eight manufacturing industries (food; beverages; tobacco; wearing apparel; plastic products, non-metallic minerals; metal products and furniture) oriented their production mainly to the domestic market during this period. All the other manufacturing sectors were engaged in both export and import competing production.

It is evident from the data that the trade exposure of South African manufacturing industries increased significantly during the latter part of the 1990s. The number of industries that were subjected to both import competing and export production increased from 11 (1990-94) to 24 (1995-2000) implying that these industries had to compete with international production in both the domestic and international markets. The basic result gleaned from table 9 is that domestic producers were not insulated from international competition. However, the question is whether these developments were in response to trade policy measures implemented during this period. The next section aims to explore this aspect more closely.

5.4.1 Trade incentives and the production of manufacturing sectors during the 1990s

Following Chenery (1979), changes in gross production can be allocated across the demand factors of domestic demand, export expansion and import substitution as follows:

$$\Delta Q = \Delta DD + \Delta EE + \Delta IS \dots\dots\dots(11)$$

where: Q = gross value of output
 DD = domestic demand
 EE = export expansion
 IS = import substitution

Equation (11) is calculated as follows:

$$\frac{(Q_t - Q_{t-1})}{(Q_t - Q_{t-1})} = \frac{(1 - m_{t-1})(DD_t - DD_{t-1})}{(Q_t - Q_{t-1})} + \frac{(E_t - E_{t-1})}{(Q_t - Q_{t-1})} + \frac{(m_t - m_{t-1})(DD_t)}{(Q_t - Q_{t-1})} \dots\dots\dots(12)$$

where m_t , Q_t , E_t represents the import coefficient (defined as the share of imports in the domestic demand), output and exports in year t , respectively.

The first term on the right hand side is the contribution of domestic demand to the growth of gross output. The second term captures the effect of export expansion. The third term reflects the change in the import coefficient for a given level of domestic demand; a positive sign indicates that import substitution has taken place while a negative sign means that foreign goods have gained market share.

Equation 12 is used to calculate the source of growth for the different sectors during the period under analysis - the information is reflected in table 10. In addition, for ease of reference, the information from figures 3 and 4 is also reproduced in table 10. The efficacy of trade policy could be determined by ascertaining whether changes in the structure of production correlate with the trade regime bias.²²

²² One would, for example, expect that an import-substituting bias in the trade regime would promote import-substituting industrialisation in that sector.

Table 10: Trade regime bias, production bias and source of growth

[1]	Sector (SIC)	1990-1994				1995-1997				Sources of growth		
		TRB ¹	DD	EE	IS	TRB ¹	DD	EE	IS	DD	EE	IS
[2]		[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	Agriculture, forestry and fishing [1]		1.78	0.23	-1.01	IS	1.35	-0.10	-0.25	0.67	0.54	-0.21
2	Coal mining [21]		0.55	0.46	-0.01		0.52	0.52	-0.04	-0.37	1.48	-0.11
3	Gold and uranium ore mining [23]		0.00	1.00	0.00		0.00	1.00	0.00	0.00	1.00	0.00
4	Other mining [22/24/25/29]	DIP	-0.05	0.68	0.37	DIP	0.53	0.19	0.29	0.26	0.63	0.11
5	Food [301-304]	PEP	0.98	0.06	-0.04	PEP	0.98	0.13	-0.11	0.86	0.18	-0.04
6	Beverages [305]		0.56	0.53	-0.09		0.80	0.29	-0.09	1.11	-0.04	-0.07
7	Tobacco [306]	IS	0.89	0.11	0.00	IS	0.55	0.48	-0.03	0.61	0.44	-0.04
8	Textiles [311-312]	IS	0.99	0.07	-0.07	IS	0.67	0.44	-0.11	0.98	0.06	-0.03
9	Wearing apparel [313-315]		0.79	0.30	-0.08	IS	0.77	-0.05	0.28	0.43	0.24	0.33
10	Leather and leather products [316]	PEP	0.62	0.73	-0.35	PEP	0.57	0.56	-0.13	0.86	0.20	-0.06
11	Footwear [317]	PEP	0.76	-0.12	0.36	IS	0.87	-0.12	0.25	0.17	-0.06	0.88
12	Wood and wood products [321-322]		0.92	0.16	-0.08		0.92	0.08	0.00	1.39	-0.35	-0.05
13	Paper and paper products [323]		0.97	0.14	-0.11		-1.42	2.46	-0.04	-0.25	1.27	-0.02
14	Printing, publishing and recorded media [324-326]	PEP	0.98	0.02	0.00	IS	1.12	0.03	-0.15	1.10	0.14	-0.24
15	Coke and refined petroleum products [331-333]		0.88	0.09	0.03		0.74	0.43	-0.16	-0.24	1.00	0.24
16	Basic chemicals [334]		1.06	-0.24	0.18		0.48	0.52	0.00	0.59	0.41	0.00
17	Other chemicals and man-made fibers [335-336]		0.99	0.10	-0.09		0.95	0.24	-0.18	1.01	0.38	-0.39
18	Rubber products [337]	PEP	1.01	-0.03	0.03	PEP	0.85	0.85	-0.70	0.65	1.21	-0.86
19	Plastic products [338]	PEP	0.98	0.05	-0.03	IS	0.96	0.17	-0.13	1.19	0.42	-0.61
20	Glass and glass products [341]	PEP	0.99	0.10	-0.09	IS	0.05	-0.87	1.82	0.67	-0.59	0.93
21	Non-metallic minerals [342]		0.94	0.21	-0.16		1.00	0.10	-0.10	1.14	0.50	-0.64
22	Basic iron and steel [351]	PEP	0.37	0.63	0.00	PEP	0.43	0.66	-0.09	0.63	0.40	-0.02
23	Basic non-ferrous metals [352]	IS	1.63	0.07	-0.70		0.64	0.39	-0.04	-0.12	1.41	-0.29
24	Metal products excluding machinery [353-355]	PEP	0.90	0.12	-0.02		0.82	0.22	-0.04	-0.01	0.41	0.60
25	Machinery and equipment [356-359]		1.65	0.52	-1.17		0.80	0.67	-0.48	-0.14	-0.65	1.79
26	Electrical machinery and apparatus [361-366]		1.01	0.16	-0.17	IS	0.25	0.37	0.38	0.23	-0.12	0.89
27	Television, radio and communication equipment [371-373]	PEP	4.85	0.64	-4.49		-0.53	-0.60	2.14	0.52	0.91	-0.43
28	Professional and scientific equipment [374-376]	IS	0.76	0.38	-0.14	PEP	1.16	1.67	-1.83	0.62	0.94	-0.57
29	Motor vehicles, parts and accessories [381-383]		0.55	0.29	0.16	IS	-0.02	0.85	0.17	0.35	-0.26	0.91
30	Other transport equipment [384-387]		1.82	0.96	-1.77		-0.82	0.78	1.04	-4.85	5.30	0.56
31	Furniture [391]	PEP	1.03	-0.69	0.67		0.39	0.70	-0.09	-0.04	1.36	-0.32
32	Other manufacturing [392-393]		1.59	2.12	-2.71		0.44	0.55	0.01	0.96	1.58	-1.54
33	Electricity, gas and steam [41]		0.99	0.01	0.00		0.99	0.01	0.00	1.01	-0.01	0.00
34	Water supply [42]		1.00	0.00	0.00		1.00	0.00	0.00	1.00	0.00	0.00
35	Building construction [51]		1.00	0.00	0.00		1.00	0.00	0.00	1.00	0.00	0.00
36	Civil engineering and other construction [52-53]		1.00	0.00	0.00		1.01	0.00	-0.01	1.00	0.00	0.00
37	Wholesale and retail trade [61-63]		0.97	0.03	0.00		0.90	0.10	0.00	0.91	0.09	0.00
38	Catering and accommodation services [64]		0.92	0.11	-0.02		0.88	0.15	-0.03	0.87	0.16	-0.04
39	Transport and storage [71-74]		0.90	0.10	0.01		0.87	0.16	-0.03	0.87	0.14	-0.01
40	Communication [75]		0.94	0.03	0.02		0.94	0.03	0.02	0.95	0.05	0.00
41	Finance and insurance [81-82]		0.97	0.03	0.00		0.92	0.08	-0.01	0.93	0.07	0.00
42	Business services [83-88]		0.98	0.01	0.01		0.98	0.03	0.00	0.97	0.03	0.00
43	Medical, dental and veterinary services [93]		0.99	0.00	0.01		0.99	0.01	0.00	0.99	0.01	0.00
44	Excluding medical, dental and veterinary services [94-96]		0.97	0.01	0.02		1.01	-0.03	0.02	0.99	0.00	0.01
45	Other producers [98]		1.04	0.02	-0.06		1.01	0.01	-0.02	0.99	0.02	-0.01
46	General government services [99]		N/A	N/A	N/A		N/A	N/A	N/A	N/A	N/A	N/A

1. Trade regime bias. No entry in this column implies that there is no bias in the trade regime (i.e free trade stance).

2. This reflects the bias in the production structure

Source: Own calculations with data from TIPS

Table 10 captures the bias in the trade regime (columns 3 and 7) and the sources of sectoral growth (columns 4, 5, 6, 8, 9, 10, 11, 12, and 13) for the

different sub-periods under analysis.²³ From column 3 and 7 it is evident that there were 16 sectors that had some bias in their trade regime.²⁴ Since we are interested in ascertaining whether production conformed to the trade incentive structure, the analysis shall focus mainly on these 16 sectors.

Firstly, considering the period 1990-94. Four sectors (tobacco, textiles, basic non ferrous metals and professional and scientific equipment) had an import substituting trade incentive bias. However, the growth in all of these sectors was due solely to domestic demand and export production.²⁵ There were eleven sectors enjoying incentives for both export and import-substituting activities (classified as PEP in column 3); none of these sectors' growth was due to *both* import-substitution and export production. Domestic demand and export production provided the impetus to growth for eight (food; leather and leather products; printing, publishing and recording media; plastic products; glass and glass products; basic iron and steel; metal products excluding machinery and television, radio and communication equipment) of these sectors.²⁶ For the remaining three sectors (footwear; rubber products and furniture) growth was underpinned by domestic demand and imports. For the other mining sector, despite there being a disincentive for both import substitution and export promotion (i.e. being subjected to a DIP strategy), both import-substitution and export production were the main sources of growth during this period.

Considering the period 1995-97 a similar picture emerges. There were 10 sectors subjected to an import-substituting trade strategy during this period. Of these sectors, five sectors (namely, agriculture; tobacco; textiles; printing, publishing and recording media and plastic products) had been subjected to

²³ Three periods are considered, namely 1990-94 (pre-tariff liberalisation period with the prevalence of export incentives and tariff protection); 1995-97 (liberalisation period with the existence of export incentives and tariff reductions) and 1995-2001 (period during which the WTO was implemented and includes the period after 1997 when GEIS was suspended).

²⁴ These sectors were identified in figures 3 and 4.

²⁵ In fact, the textiles, basic non-ferrous metals and professional and scientific equipment sub sectors all experienced an increase in imports during this period. This is depicted by negative values under column 6 in table 10.

²⁶ In fact for the majority of these sectors, there was an increase in imports during this period.

rising import levels despite there being an incentive for import-substitution. However, probably of greater significance is that with the exception of the agricultural sector, all the other sectors (tobacco; textiles; printing, publishing and recording media and plastic products) also experienced rising export production during this period. The impetus to growth in the five sectors (food; leather and leather products; rubber products; basic iron and steel and professional and scientific equipment) that were subjected to a PEP trade strategy all came from domestic demand and export production; of interest however, is that all these sectors were not insulated from imports. Even in the case of the other mining sector, export production and import-substitution occurred despite a disincentive for export production (import-substitution).

An analysis of the sources of growth over the period 1990-94 and 1995-97 reveals that the change in the structure of production did not conform to the bias in the incentive structure. This suggests that conditions of imperfect competition may have characterised the economic environment during the 1990s.

As pointed out in chapter four, South Africa embarked on an extensive tariff liberalisation programme after 1995. With tariff liberalisation there is an expectation that imports would have increased. Imports have indeed increased during 1990s; this is borne out in table 10 (columns 6, 10 and 13) and table 9 (columns 2 and 3).²⁷ However, the extent to which this could be attributed to tariff liberalisation should be subjected to more rigorous analysis. This aspect will be explored in greater detail in chapter 8.

5.5 Concluding remarks

In this chapter the incentives accorded to manufacturing production during the 1990s have been considered. The analysis has shown that:

- The conventional measure of anti-export bias has been called into question. Working within a three-sector framework, it was found that

²⁷ This is borne out by negative values in the respective columns in table 10.

South Africa's trade policy bias against exports has been exaggerated in the economic literature.

- The nature of the change in production does not match or correspond to the allocation of trade incentives given during the 1990s. This is particularly the case for the latter part of the 1990s where export production continued despite the prevalence of import substituting incentives. This suggests that the South African economy may be characterised by conditions of imperfect competition.

The latter point is important since under conditions of imperfect competition, the anticipated price effects of liberalisation may not materialise. The next chapter provides a more detailed analysis of this aspect.