LOCAL CONTENT PROTECTION IN THE MOTOR VEHICLE INDUSTRY IN SOUTH AFRICA, 1960 - 1990

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DECLARATION

I hereby declare that this whole dissertation, unless specifically indicated to the contrary in the text, is my own original work, and has not been submitted for a degree at any other university.

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INTRODUCTION

Tariffs imposed on imported motor vehicles were used in countries such as South Africa to encourage the **local assembly of motor vehicles** from imported components which were manufactured in the countries where the main motor vehicle companies were located. In the period after the Second World War attempts were made in South Africa (and elsewhere) to promote **the local manufacture of motor vehicle components.** This was done by requiring that some specified minimum proportion of components by mass (or other criterion, such as value) be produced by domestic firms; and by allowing in duty free imported components if the local content targets were met. It has been pointed out that such an arrangement is equivalent to a "proportionally distributed quota in which duty free imports are permitted in some specified proportion to purchases from domestic producers"(1).

This study seeks to assess the effects of local content protection, applied to the South African motor vehicle industry, on resource allocation, the balance of payments,economic growth, employment and other variables in the South Africa economy and the motor vehicle industry in particular.

METHODS AND SCOPE OF THE STUDY

The scope of this study is limited to South Africa only, and it is confined to the motor vehicle manufacturing industry covering both the assembly of vehicles by the major companies and the manufacture of components by these same companies as well as by independent companies - with the focus on component manufacturing. The period of research is from 1962 to 1990, with six sub-periods. The first five viz. 1962-1964, 1964-1971, 1971-1977, 1977-1979, and 1980-1989 correspond to the five phases that South Africa local content programmes have been through since commencement in 1962. In addition, phase VI which started in March 1989 will form part of this study. Although its effects were not fully clear by 1990, it introduced new features which are important enough to justify some attention.

The methods employed in this study are as follows:

1. A standard **theoretical** framework is outlined within which it is possible to discuss the benefits and costs of protection in general, and the cost of local content protection as a particular type of protection. Theoretical analysis is also employed in considering important possible features of the motor industry, such as economies of scale; and a theoretical treatment is given of the implications of the switch from **physical** content protection to **value** content protection.

2. A substantial part of the discussion is **empirical**. It employs published **statistical data** from public sources (the Board of Trade and Industry, the Industrial Development Corporation and Central Statistical Services) and from private sector organisations, such as the National Association of Automobile Manufacturers of South Africa (NAAMSA) and the National Association of Automotive Component and Allied Manufacturers of South Africa (NAACAM), to establish what has happened over time to target variables such as the industry's output, employment and net imports.

3. At various points of the discussion articles in **newspapers** and **business magazines** are drawn on for factual information about the industry and its policy environment. Similarly, information from **academic journals and books** is employed to put together a picture of the world-wide motor vehicle industry, its changing technology and production methods, and the prospects for Third World producers.

4. At an early stage of research some **personal interviews** were conducted with production managers and other officials in motor vehicle manufacturing companies. These are not reported in the thesis since they yielded initial orientation rather than hard data.

OUTLINE OF THE ARGUMENT

Chapter 1 summarises the basic economic theory which is relevant when an attempt is made to assess the desirability or otherwise of policies of protection. This chapter outlines the various

types of market failure, the existence of which are advanced as justification for state intervention in the market economy. Focusing on international trade, the chapter discusses the ways in which trade protection imposes costs and leads to misallocation of resources. It also elaborates the arguments **for** trade protection based on market failures and shows how it can in principle be claimed that benefits of the kind obtained from such intervention may exceed the costs they impose. Finally, the chapter presents a theoretical analysis of local content protection as a particular type of protection, comparing it favourably with **tariff** protection of local components.

Chapter 2 provides historical background to the introduction of local content protection and the subsequent development of the policy. It outlines the rationale given at the time for this government intervention, and lists specific instruments used to bring about local manufacturing or increased use of local parts and components by motor vehicle manufacturers. The chapter concludes with a summary of views on the effects of promoting domestic production of motor components in South Africa. It is clear that there are some disagreements among commentators, and these are noted for further investigation.

Chapter 3 sketches the history of the South Africa motor vehicle industry in the period **after** the introduction of the policy of local content protection. In particular, trends in (1) the sales of new vehicles, (2) the output of components and (3) the size of the labour force employed in assembly and manufacturing are investigated. The intention is to assemble some of the basic information required for the evaluation of the policy in the next two chapters.

Chapter 4 looks at the **excess cost problems** that motor vehicle industries in South Africa and other developing economies are said to experience - due to various sources of low productive efficiency but fundamentally because of failure to achieve economies of scale. Pursuing this last point the chapter examines the consequences of having many makes and models in the South Africa vehicles industry. The chapter then considers Bell's claim that excess costs in the South African industry are " much smaller than commonly supposed".

Chapter 5 evaluates whether local content protection has produced benefits such as a greater measure of diversification of the industry, greater employment opportunities, the attraction of

capital to South Africa and the acquisition of new skills and technological capacity. An evaluation is also made in relation to the effects on the Balance of Payments of local content protection. This is done both because a reduction in imports was an original goal, and because concern with export promotion influenced the shape of phase VI of the programme.

Chapter 6 discusses the consequences of switching from physical content protection to value content protection with the introduction of phase VI. The possible reasons for the change are also presented. The analysis of the consequences of this switch is derived from an article by Trevor Bell (2) and hinges on a claim he makes that when overseas manufacturers of vehicles and components are in partnership with local firms they charge **in excess of world competitive prices** for the components they supply. A preliminary discussion of prospects for the new programme rounds off the chapter.

Chapter 7 summarises the main findings of the study - and some remaining puzzles.

REFERENCES

1. McCulloch, R. and H.G.Johnson(1973),"A note on proportionally distributed quotas", **American Economic Review**, Vol.63, pp.726-732. The formulation quoted here is from Neil Vousden, **The Economics of Trade Protection**, Cambridge: Cambridge University Press, p.41

2. Bell, R.T. (1989), "Content protection in the motor vehicle industry in the presence of joint ventures", **South African Journal of Economics**, vol.57,no.2, pp.103 - 123

NOTE ON REFERENCE SYSTEMS.

A hybrid of the Oxford and the Harvard reference systems is employed in this dissertation. Although this involves unnecessary duplication of reference information at times, it does provide complete and consistent information that does not mislead the reader.

CHAPTER 1

THE COSTS AND BENEFITS OF TRADE PROTECTION: TARIFFS AND LOCAL CONTENT REQUIREMENTS.

1.1 INTRODUCTION

The purpose of this chapter is to summarise the basic theory which is relevant when an attempt is made to assess the desirability or otherwise of policies of trade protection, of which local content policy is one. **Section 1.2** outlines the various types of market failure which are advanced as justifications for state intervention in the market economy. This discussion is relevant because the imposition of tariffs and other protective devices is an example of state intervention in market transactions, and a defence of protection can be constructed using market failure arguments. **Section 1.3** discusses the ways in which economic protection imposes costs and causes misallocation of resources in the economy. **Section 1.4** elaborates the arguments for protection based on market failure and shows how it may be possible to claim that benefits of the kind obtained from such an intervention exceed the costs that result from it. It also takes note of the arguments that there may be alternative policy interventions (often these are subsidies of various kinds) which provide the same benefits as tariff-type protection but at a lower cost. **Section 1.5** summarises some theoretical views about local content protection as a particular type of trade protection which has advantages compared to tariffs on imported components.

1.2 MARKET FAILURE

There has in recent times been a good deal of debate in economics about the role of state intervention in economic life. A standard view two decades ago was that state intervention was often justified since there were not infrequent cases of **market failure** i.e. situations when markets did not operate in such a way as to satisfy the conditions required for the attainment of welfare-maximisation. This view was also sometimes

supplemented by arguing that there were other legitimate goals (than economic efficiency) which markets would not attain and which needed state action if they were to be achieved. Such goals were equity (in income and welfare distribution),national independence and other religious and ethical goals. In the last decade or so a critique has developed - based on public choice theory and other arguments - which insists that often state intervention is as unable as the market economy to address certain problems, and that there may be serious costs of **state failure.**

At the same time, however, the development of the theory of information and uncertainty has pointed to additional sources of market failure, such as the absence or incompleteness of markets, and given new explanations of market imperfections - such as efficiency explanations of wage-rigidities in labour markets and of rationing in credit markets.

While not all sources of market failure have been employed in defending protection policies in the domain of international trade, a reasonably full list will be produced here so as to give coherence to the overall argument. In section 1.4 below, the discussion will focus on those sources of market failure which have a particular relevance to international trade. There is an extensive literature on the sources of market failure from which the following can be distilled(1):

1.2.1 FAILURE OF COMPETITION (INCLUDING MONOPOLY)

Briefly this can be said to be the case whenever some participants have market power, i.e. some agents are not price-takers. The relevance of such market structures is that a market system will sustain welfare-maximisation or Pareto-efficiency only when markets are competitive. State intervention may therefore be desirable to promote greater competition or to safeguard against the abuse of monopoly power.

1.2.2 PUBLIC GOODS

This is the name given to various desirable goods and services that would not be

supplied (or not supplied efficiently) by private enterprise, including maintenance of law and order, national defence, public health etc. The type of co-operative action needed for provision of this type of service will not normally result from competitive maximisation by individuals of their own welfare, necessitating public provision by the state. This is because public goods are non-rival in consumption and there will be free-riders if co-operation is left to voluntary initiatives.

1.2.3 EXTERNALITIES

These are costs associated with the production of an output which accrue to members of society at large and are not reflected in a producer's cost of production,or benefits which are not reflected in his revenue. The damage caused to the environment by industrial waste is a common example of an external cost. The value to local farmers of tracks created by timber hauliers is an example of an external benefit. Market processes under-produce commodities which generate positive externalities, and over-produce commodities which generate negative externalities.

1.2.4 INFORMATION FAILURES

Lack of sufficient information limits the public (consumers and producers) in making good economic decisions. As a result the government may be able to play a role in remedying the under-production of information. Examples of government intervention in the face of information failure are (i) employment exchanges and (ii) state-run agricultural extension services for farmers. Clearly there is some overlap between (b), (c) and (d). Information has public-good characteristics and its production also has external effects.

1.2.5 MARKET IMBALANCES

A requirement for the efficiency of a market system is that all prices are perfectly

flexible. In the presence of excess supply or excess demand i.e market imbalances,prices should adjust so as to eliminate the "imbalances" and clear all markets. In real world economies this condition is often not met. Prices in goods and factor markets may be fixed or sticky (at least in the short run). Whatever the full explanation of fixed prices(or sluggish price adjustments) may be, their existence creates market disequilibria and prevents the attainment of Pareto-optimal levels of consumption and/or production.

1.2.6 INCOMPLETE MARKETS

This condition can be said to exist when markets fail to produce items which people desire and for which they would be willing to pay more than the cost of production. Widespread examples are the frequently incomplete coverage of credit markets and the unavailability of various types of insurance contracts, both in rural areas and more generally.

1.2.7 DECREASING AVERAGE COSTS

If the technology of the firm is such that marginal and average variable cost curves slope downwards, at least for quite substantial production intervals, and if the firm operates in this range according to the Pareto-optimality requirement (P=MC), it will not cover its variable production costs (MC<AC) and it will cease to operate. Attainment of the Pareto-optimal output requires that production is subsidised.

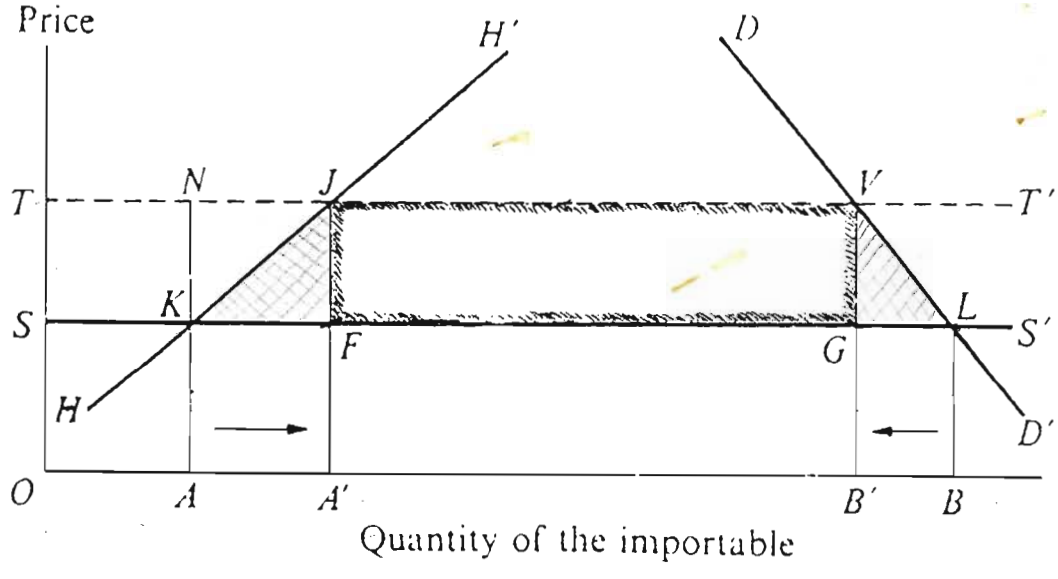
1.3 THE COST OF TRADE PROTECTION

The free trade standpoint uses international competition as the key test of efficiency. The essence of this point is that bringing incentives for domestic resource use closer to international opportunity costs encourages a more efficient and more productive use of resources. Increased competition faced by domestic producers will increase the pressure on them to keep their costs down to the level of international producers in order to

compete in world markets. Commitment to free trade will induce local producers to make sure that the quality of their products meets international standards, and that they respond to consumer preferences and changing circumstances.

A standard diagrammatic analysis (using a simpler model than the argument of the previous paragraph assumes) can be used to show the loss of free trade benefits, or the cost of protection in the presence of a tariff. Assume a small open economy which is a price-taker in international trade, but decides to introduce a tariff of ST per unit on imports of some commodity. Assume the local industry producing this commodity is competitive, and has supply curve HH'. Demand for the commodity in this open economy is shown by DD'. Figure 1.1 indicates that in the initial free trade equilibrium, consumers buy OB at the price OS, determined by the foreign supply curve SS'. Domestic producers supply OA and imports are AB.

FIGURE 1.1 NET NATIONAL LOSS FROM A TARIFF



Source: W.M Corden (1971) p.6 (2)

SS = supply curve of imports

An import tariff of ST per unit raises domestic price to OT, and results in consumption contracting to OB'. Domestic producers supply OA' at the higher price, and imports are reduced

to A'B'. The government receives ST of tariff revenue on each imported unit, or FJVG in total. Welfare gains and losses (as measured by consumer and producer surpluses) resulting from the tariff are as follows (gains indicated by (+), losses by(-)) (3):

CONSUMER LOSS	- STJK	-KJF	-FJVG	-GVL
PRODUCER GAIN	+STJK		+FJVG	
GOVERNMENT REVENUE			+FJVG	
NET NATIONAL LOSS		-KJF		-GVL

The tariff lowers overall community (national) welfare by the sum of KJF and GVL, and transfers STJK from consumers to producers and FJVG from consumers to government. STJK now represents producer surplus and FJVG in revenue from the tariff. The two areas of social loss KJF and GVL are usually referred to as the **production effect** and **consumption effect** of the tariff respectively. JKF is called the production effect because it is the excess cost of increased domestic production (KJF plus AKFA') compared to the cost of foreign production (AKFA'). GVL is the consumption effect because it is that portion of the reduction in consumer surplus caused by lower actual consumption rather than simply by higher prices.

Free trade permits resources to be allocated through market signals rather than through controls and protection. As indicated earlier this implies that the essence of free trade is to allow national patterns of production to be shaped largely by international norms of competitive efficiency. The resultant international pattern of specialisation in production and the direction of imports and exports are determined by comparative advantage. Rudiger Dornbusch put the point forcefully when he wrote recently that "the static gains from improved resource allocation which are the classical source of a gain from freer trade" could be described as follows:

"Under perfect competition a small-price taking country will gain by eliminating tariffs. Consumers are better off because their incomes stretch further, and resources are used more efficiently because they are no longer used to produce goods that could be imported at a lower price" (4).

An additional important point (which applies when we drop the perfect competition assumption) is made by Dani Rodrik who writes that foreign trade encourages domestic monopolies to behave competitively, resulting in welfare benefits that are larger than conventional gains (5).

Both conventional and additional (i.e. monopoly-reduction) gains from free trade are foregone when tariffs are introduced, and their loss thus constitutes the cost of tariff protection.

1.4 THE BENEFITS OF TRADE PROTECTION

1.4.1 This section makes an attempt to show that there may be benefits to be derived from a trade policy based on protection. It does so by arguing that trade protection belongs with a range of government interventions which may be justified in the presence of market failures (see section 1.2 above).

1.4.2 DISTORTIONS, MARKET FAILURES AND TRADE POLICY

The approach to trade policy **via** domestic distortions sees most arguments for protection as originating in some market failure (or"distortion") - understood as a divergence between magnitudes which ought to be equal if the Paretian conditions for a welfare maximum are to hold. For example price diverges from marginal cost in a monopoly, and also in situations where long-run average cost falls and price is set to cover average cost. Also there is divergence between private and social benefits or between private and social costs in situations where externalities exist and where there are market rigidities and imperfections. Thus if potential employers must pay a union-determined wage to employees whose supply price is below that level, the private cost to the producer is higher than the true social (opportunity) cost determined by a worker's supply price. On the other hand, in similar developmental circumstances the private benefits of increased output and employment are less than the social benefits which include skills formation and changing attitudes to work and economic life that result from learning by doing. Technology diffusion to society as workers move to other occupations is another social benefit.

The analysis we are outlining then points to the need for an intervention (subsidy,tax,tariff etc.) to offset the original distortion. The benefit of such action is the offsetting of the distortion; its cost is the likely generation of a by-product distortion. Thus if the private cost of labour to manufacturing industry exceeds its social opportunity cost, a tariff will correct the under-employment and under-production that results. However the tariff generates costs (by-product distortions) in the form of production and consumption effects (as seen in section 1.3).

1.4.3 THE INFANT INDUSTRY ARGUMENT

Many of the points made in the previous section are gathered together in the "infant industry" argument. A country might, at the earliest stage of development, be expected to choose a temporary trade policy of protection until it has been able to move far enough down its cost curves to no longer need protection. The benefits that result are economies of scale, job skills and capability building as a result of learning by doing, and technology diffusion. Many aspects of technology transfer leading to technological upgrading occur through interactions (between firms) that are partially or wholly "outside the market". Such interactions occur in the following forms (some of which have already been mentioned):

(a) Movement of labour from one firm to another bringing knowledge of new or improved technologies and products. This is diffusion of knowledge through labour mobility.

(b) Technology transfer through journals, meetings,etc organised within the industry.

(c) Technology innovation induced by interaction between innovations and requirements in complementary activities. (6)

The beneficial effect of a tariff in promoting domestic production (along with a range of the above benefits, as we would now say) was vividly expressed by P.T. Elsworth (1958) when he wrote that:

"protection can be an effective means of stimulating the development of an industry that is well suited to a country but which finds it impossible to get started unless it is sheltered from the blast of competition from established foreign producers". (7)

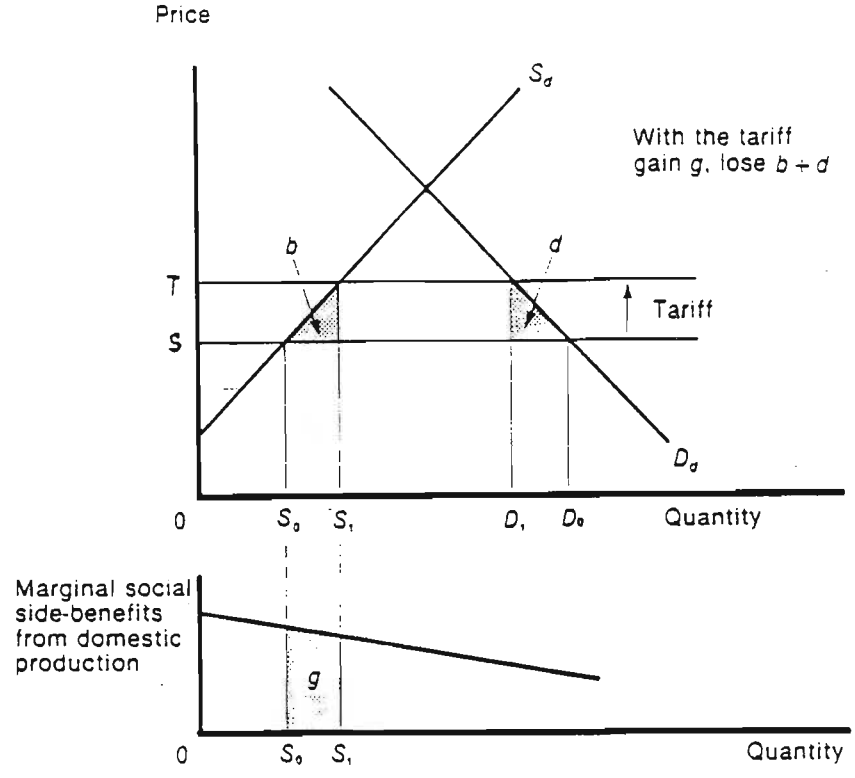
This argument for temporary protection (or other intervention) needs some additional supports. Future benefits - either lower costs due to economies of scale or learning by doing, or increased skills and know-how - could in principle be financed by capital market borrowing or by labour market arrangements such as apprenticeship supplemented by borrowing etc. If these are not available then the "distortion" has to do with imperfections of capital and labour markets.

1.4.4 TARIFFS, SUBSIDIES AND OPTIMAL INTERVENTION

1.4.4.1 GRAPHICAL REPRESENTATION OF THE BENEFIT OF A TARIFF

The benefits that result from tariff protection can be represented graphically as in figure 1.2 below. The marginal side-benefits of protection such as skills acquired by the labour force, reduction of costs of production in the long run,and other benefits discussed in the previous sections are represented by area g in the lower panel of the diagram.

FIGURE 1.2 GAINS AND LOSSES WHEN DOMESTIC PRODUCTIONIS ENCOURAGED BY A TARIFF.



Source:Peter H.Lindert(1986),p.150(8)

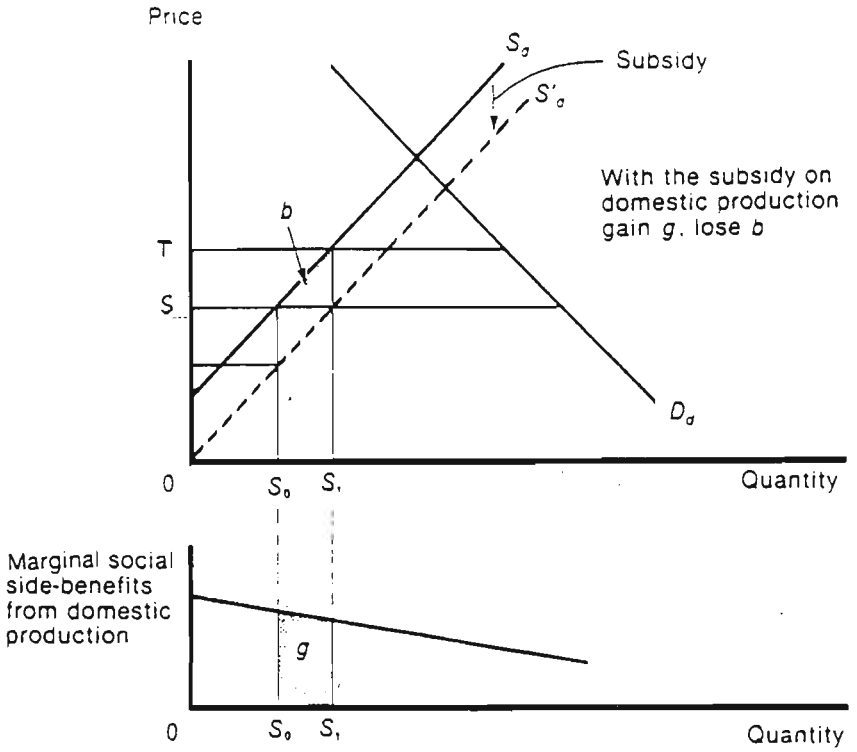
We have already drawn attention to the fact that tariff protection results in welfare costs. These are indicated here by areas b (KJF in Figure 1.1) and d (GVL in Figure 1.1). b and d are the production effect and consumption effect when there is a tariff of ST per unit imposed on the imported product.

Presumably economists must attempt where possible to quantify both costs and benefits. Whether there are net benefits or net costs depends on whether area g (benefit) is greater or less than the sum of areas b and d (costs).

1.4.4.2 SUPERIORITY OF A SUBSIDY TO A TARIFF

However, even if there are net benefits from the imposition of a tariff, according to standard trade theory tariff protection may not be the best way of responding to, or correcting, distortions as figure 1.3 shows.

FIGURE 1.3 GAINS AND LOSSES WHEN DOMESTIC PRODUCTION IS ENCOURAGED BY A SUBSIDY.



Peter H.Lindert(1986),p.150 (9)

A subsidy of ST per unit produced (equivalent to the tariff) has the following results. The domestic supply curve S_d shifts to $S`_d$ because of the subsidy. A close look at figures 1.2 and 1.3 reveals that both the tariff and subsidy result in the same amount of increased production (S_0-S_1) and side benefits represented by g. The superiority of a production subsidy over a tariff is that it (the subsidy) does not increase the domestic price and so does not result in a reduction in consumption as the tariff does (see D_1-D_0 and area d in figure 1.2). This means that a subsidy on domestic production equivalent to a given tariff leads to benefits represented by g and loss of b (production effect) instead of b and d as with the tariff.

1.4.4.3 GENERALISATION OF THE ARGUMENT ABOUT THE SUPERIORITY OF A SUBSIDY.

A study by Greenaway and Milner reviews research on the question of optimal intervention. They say that "the most efficient way of reacting to a particular distortion is to apply an instrument which minimises the number of by-product distortions. Invariably this means using an instrument **which treats the distortion at its source**".(my emphasis) (10).

Instruments that can be used for intervention in an illustrative case are listed in Table 1.1. Instruments are ranked hierarchically - from the optimal (or first-best) intervention onwards (downwards). The use of import tariffs (no.5) is clearly dominated by other policy alternatives - including three types of subsidy, in addition to removal of the distortion at source.

TABLE 1.1 WELFARE RANKING OF POLICY INSTRUMENTS

Distortion - private cost of labour exceeds the social opportunity cost

Instrument	*By-product distortions*
1. Remove distortions at source	None
2. Wage subsidy	Distortion from raising revenue (depending on tax used).
3. Production subsidy	(2) plus downward bias in labour intensity
4. Import tariff plus export subsidy	(3) minus distortion from raising revenue plus consumption distortion
5. Import tariff	(4) plus greater consumption distortion
6. Quantitative restriction	(5) plus potential loss of government revenue to license holders and greater administrative complexity and greater dynamic inefficiencies
7. Source specific quota/voluntary export restraint	(6) plus export of rent to foreign licence-holders and trade diversion

Source: Greenaway and Milner (11)

1.4.4.4 FINANCING SUBSIDIES

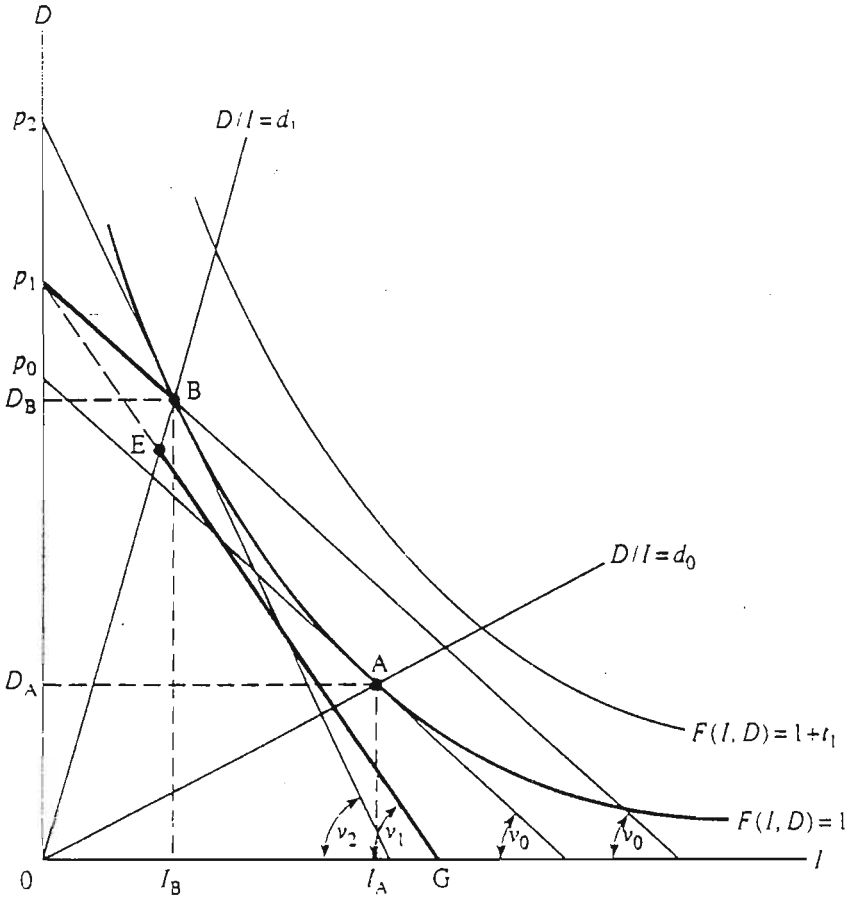
The welfare argument of subsection 1.4.4.2 is maintained if the preferred subsidies can be financed by lump-sum taxation. If not, then the taxes imposed

to finance the subsidy will themselves "distort" economic decisions, as clearly outlined in Table 1.1 above. And so the superiority of the subsidy is less clear-cut.

1.5 ANALYSIS OF LOCAL CONTENT PROTECTION AS A PARTICULAR TYPE OF TRADE PROTECTION

The objective of this section is to try to characterise local content protection,and to compare and contrast it with ordinary tariff protection. It is argued that a local content programme as usually operated is less costly in welfare terms than a tariff on imported components. The literature shows two approaches to modelling this question and I shall present both of them briefly. Mussa (12) assumes that D (Domestic inputs) and I (Imported inputs) are not perfect substitutes, but can be substituted smoothly for each other - as illustrated by the unit isoquant, F (I,D)=1 in fig. 1.4.

FIGURE 1.4 THE EFFECT OF CONTENT PROTECTION ON INPUT CHOICE: IMPERFECT SUBSTITUTION



Source:Mussa(1993),p.269 (12)

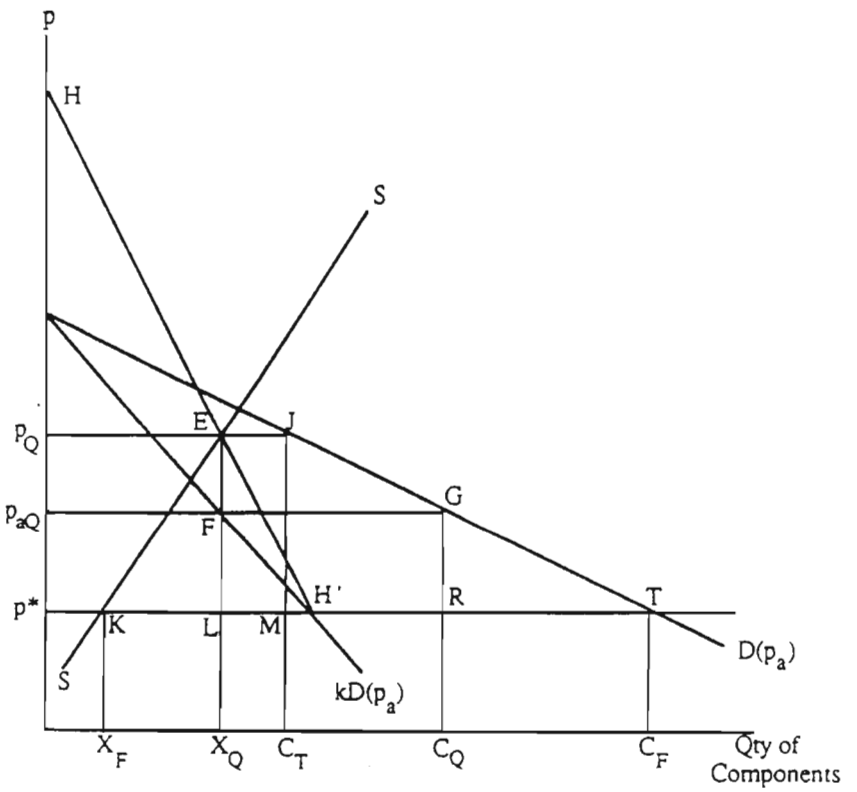
At the relative price of imported input $=v_o$, the cost minimising input combination is at A, $(D/I=d_o)$ and the output price is p_0 (measured in terms of domestically produced components). When a local content target ($D/I=d_1$,and $d_1>d_o$) is imposed, the input combination is at B and the output price is p_1. The cost of introducing a local content target is the difference between p_o-p_1.

When an equivalent tariff (i.e. tariff which will raise the D/I ratio to d_1) is introduced, the relative price of imported inputs rises to v_2 and producers charge p_2 for output. The higher price of p_2 indicates that there is a consumption distortion loss from introducing the tariff. This point is emphasised by Mussa (1993) where he writes that "since p_1 is the true social cost of producing a unit of output using the input combination at B, the difference p_2-p_1 measures an excess of price

charged to consumers over true social production cost and implies a consumption distortion loss in excess of the distortion loss from content protection" (13).

The second model of a local content scheme that enables the effects of tariffs and local content schemes to be compared is presented by Neil Vousden (1990) (14) and is illustrated in figure 1.5 below. In Vousden the two types of components are perfect substitutes but have different prices, the price of domestic components being higher than that of the imported components. The price of imported components is p* while that of domestic components (p) depends on the level of output as shown by the domestic supply curve SS.

FIGURE 1.5 THE EFFECT OF CONTENT PROTECTION ON INPUT CHOICE: PERFECT SUBSTITUTION.



Source:Neil Vousden(1990),p.42 p.(14)

Vousden here assumes a volume based scheme. He supposes a final good (such as a motor vehicle) is produced using a single intermediate good or component (such as an engine). The input-output ratio is fixed (one engine per vehicle). These inputs may be bought from domestic component manufacturers (quantity X at price p) or imported (quantity X* at p*) and, as noted above, are perfect substitutes. Output of the final good is denoted by C. All relevant markets are competitive.

Since there is a fixed input-output ratio

$$C=X+X^*$$

If government imposes a local content requirement on final good producers viz. proportion k of total components must be produced domestically,then

$$X=k(X+X^*)=kC$$

If they comply with this requirement, motor vehicle producers buy proportion k of engines domestically at price p and proportion (1-k) at import price p*. The "average " price of an engine is given by

$$p_a = kp+(1-k)\ p^*$$

Total demand of components (X+X*) is a function $D(p_a)$ of this average price (see figure 1.5). The demand for domestically produced components as a function of average price is $kD(p_a)$. What determines domestic output and price in the local components sector? We have a supply curve in terms of p, but need to derive a demand curve in terms of p. For a given p*, the demand price for any X is shown by curve HH': this is the amount (p) which car producers are willing to pay for X given that the remaining proportion (1-k) of imported engines is available at p* per unit. HH' lies above curve $kD(p_a)$ for all average prices above p* since p necessarily lies above p_a. At H', $p_a=p=p^*$ and so HH' and $kD(p_a)$ coincide. p (price of domestic components) is determined,as p_Q, at E by the intersection of HH' and SS. Domestic output is X_Q. The average price associated with X_Q output is p_{aQ} and is derived from $kD(p_{aQ})$ at F. At this average price total demand for components can be read off $D(p_a)$, as C_Q, at G.

When comparison is made with free trade (where total engine purchases are C_F and local production is X_F), the welfare cost of the content scheme is EKL(production loss) and GTR (consumption loss).

When a tariff is compared with the content scheme, we notice several differences. Amongst these differences can be mentioned the fact that the prices for imported and domestic components are the same under the tariff -at level p_Q. The effect of paying the same increased price for both imports and domestic components is an increase in deadweight loss (DWL) on the consumption side. This loss increases to JMT, compared with GRT only under the local content scheme. The deadweight loss on the production side remains at EKL for both tariff and content schemes.

In conclusion, it is important to note that whether inputs are perfect or imperfect substitutes, the local content scheme (involving a tariff on imported inputs as a penalty for non-compliance but free imports given compliance with a local content requirement) is superior to an equivalent tariff on imported components as a device for increasing domestic production of components.

Finally, there **are** costs involved in local content programmes- even if they are less than those caused by tariff protection. There may well be gains in the presence of certain distortions such as malfunctioning labour markets, learning effects, economies of scale etc. In what follows we attempt to identify and provide some quantitative information about these gains and losses in the South African motor vehicle case.

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CHAPTER 2

INTRODUCTION AND DEVELOPMENT OF LOCAL CONTENT PROTECTION IN THE SOUTH AFRICAN MOTOR VEHICLE INDUSTRY.

2.1 INTRODUCTION

The chapter is arranged as follows:

Section 2.2 discusses the introduction of local content protection in South Africa. It does so by presenting the objectives of local content protection as they were outlined at the time in official publications, such as those of the Board of Trade and Industry (B.T.I).

Section 2.3 examines how the authorities hoped to enforce compliance with local content protection, and how local content targets were raised over time.

Section 2.4 presents a sample of recent opinions to indicate that there are some disagreements about aspects of local content protection in South Africa and other developing countries. Some of the issues noted will be pursued in later chapters.

2.2 INTRODUCTION OF A LOCAL CONTENT PROGRAMME BY THE SOUTH AFRICAN GOVERNMENT

The first major move to establish local content protection was undertaken in 1962 when the government set a target for all producers of motor vehicles to ensure that **twenty percent** of the entire **mass** of locally assembled motor vehicles consisted of locally produced components. Local content protection had already been introduced in Brazil in 1956, and was introduced in Argentina and Mexico in the same year as South Africa.

In general these countries used local content programmes to develop motor vehicle manufacturing within their boundaries, conceiving of this industry as the backbone of a set of expanding manufacturing sectors which would provide the main thrust towards economic growth. South Africa also targeted this industry in much the same way.

A formal statement of the objectives involved when introducing local content protection was presented in a report by the South African Board of Trade and Industry in 1960 (report no. 613) (1). The advantages that would result from the development of motor vehicle (component) manufacturing were:

(i) The influence the heavy fixed investment in the motor vehicle industry would have in promoting growth in the South African economy - that is, the motor vehicle industry would act as an engine of growth for the entire economy;

(ii) Job opportunities that would result in the component industry and its supply industries as a result of local content targets;

(iii) Greater savings of foreign exchange as the motor vehicle industries progressively incorporated locally made components rather than imported ones;

(iv) Associated benefits in the acquisition of engineering and industrial expertise and skills and technology transfer.

The B.T.I. further made recommendations to guide the formulation of local content protection over the years.

These recommendations were :

(i) Vertical disintegration of the motor vehicle industry - that is, component

manufacturing and motor vehicle assembly should not fall under one management or (thus) constitute one industry;

(ii) Large production volumes to minimise cost per unit;

(iii) Concentration on **fewer** basic models to achieve large production volumes and achieve the goals stated in (ii) above;

(iv) Progressive increases over time in the percentage of local content required.

Presumably the B.T.I. in its first recommendation above was suggesting that attempts be made to develop component manufacturing in such a way that large scale specialist component firms would emerge serving a range of assemblers. As with the second and third recommendations they were proposing that economies of scale should as far as possible be achieved - so as to offset to some extent the (presumed) increasing costs which would result from the successively higher content requirements proposed in their fourth recommendation.

So far we have considered the general objectives that local content protection in the motor vehicle industry was put in place to pursue. The evidence suggests that the immediate and pressing reason for the introduction of local content protection in 1962 was the fact of rising imports of motor components at a time when the balance of payments was under pressure. (a) The 1960 B.T.I. report identified the motor vehicle industry as the largest current consumer of foreign exchange reserves (2). (b) Moreover its imports were rising steeply from £44.9m in 1956 to £74.2m in 1958 (70% increase in two years) and they were rising not only absolutely but as a percentage of total imports - 19% (1955) to 25%(1958) (3).

According to the B.T.I. this was the fundamental reason for the introduction of local content protection. That there was scope for the policy is indicated by the fact that in these years manufactured components made in South Africa accounted for only 18-19% of the total material cost of assembled vehicles (see Table 2.1).

TABLE 2.1 THE SOUTH AFRICAN MOTOR VEHICLE ASSEMBLY INDUSTRY MATERIAL CONSUMPTION,1956-1958.

(LANDED COST)

1958	total	% of total	% of total
IMPORTS			
CKD MATERIAL	48,573,398	77.8	
SUW	2,492,340	4.0	
INDIRECT	171,012	0.3	
SUB-TOTAL	51,240,750		82.1
LOCALLY PURCHASED			
DIRECT MATERIAL	10,466,373	16.8	
INDIRECT MATERIAL	715,090	1.1	
SUB-TOTAL	11,181,463		17.9
TOTAL MATERIAL	62,422,213		100.00
1957			
IMPORTS			
CKD MATERIAL	34,679,235	77.2	
SUW	1,654,897	3.7	
INDIRECT	114,695	0.3	
SUB-TOTAL	36,448,827		81.2
LOCALLY PURCHASED			
DIRECT MATERIAL	7,828,458		
INDIRECT MATERIAL	619,149		
SUB-TOTAL	8,447,607		18.8
TOTAL MATERIAL	44,896,634		100.0

1956

IMPORTS			
CKD MATERIAL	32,346,191	77.7	
SUW	1,468,369	3.5	
INDIRECT MATERIAL	199,355	.5	
SUB-TOTAL	34,013,915		81.7
LOCALLY PURCHASED			
DIRECT MATERIAL	7,119,621	17.1	
INDIRECT MATERIAL	514,138	1.2	
SUB-TOTAL	7,633,759		18.3
TOTAL MATERIAL	41,647,674		100.0

CKD=COMPLETELY KNOCKED DOWN
SUW=SET UP ON WHEELS

SOURCE : B.T.I. (1960) (3)

In principle it would have been possible to pursue the objectives of Balance of the Payments improvement by industrial policies aimed self-consciously at promoting exports. In practice the South African government confined its local content programmes to the objective of reducing imports. It was not until 1989 with the introduction of **phase VI** of the programme that specific encouragement was given to exports.

2.3 DEVELOPMENT OF THE LOCAL CONTENT PROGRAMME OVER TIME

As Mussa says, "to enforce an effective domestic requirement, there must be an incentive for compliance or a penalty for violation"(4).

In an effort to induce compliance with local content protection i.e to encourage the motor vehicle industry to incorporate locally produced components, certain instruments were implemented. Among those adopted in South Africa were:

(i) Tariff protection estimated at twenty percent **ad valorem** on components. The requirement for Phase 1 which started in 1962 expected manufacturers to incorporate **twenty** percent by mass of locally produced components such as tyres, interior trims, batteries, road springs, glass and seat frames. Failure to meet this target was punishable by payment of the above tariff on all imports of components.

(ii) The second instrument was the grant of an increased number of import permits as local content increased beyond the target (5). Before 1962 there had already been an established procedure which imposed penalties with regard to import permits imposed on motor vehicle producers who did not purchase specific, listed parts and components which were available in South Africa at that time.

(iii) Thirdly, a reduction in excise duties as local content increased.

The target required under local content programmes varied from one phase to the other. Targets and penalties under Phase II were based on the "manufactured model scheme" introduced from the beginning of July 1964. Under this arrangement, manufacturers who increased local content targets to **forty five percent by weight** were considered to have achieved the target and their models were declared "Manufactured". As a result they were exempted from excise duties and import permits were freely issued if they wished to import the remaining percentage from abroad. Targets for "manufactured models " increased to **fifty five percent** at the end of phase II in 1969. Phase II was followed by a standstill year intended to gradually change measurements from **gross** to **net** local content. Imported materials used by local components manufacturers were to be deducted to arrive at the net local content.

In terms of phase III, excise duty on motor vehicles failing to meet the target of **fifty two percent net** local content was forty two cents per kilogram, of which eleven cents per kilogram could be rebated if motor vehicle manufacturers achieved the target. The target was supposed to increase from fifty-two percent in 1971 to **sixty-six percent net** local content by weight **at the end of 1976**. Phase IV was a standstill period and as a result no local content targets were increased during this period. Methods of evaluating local content targets under phase V became more flexible because of the **weighted averages** used to define and measure the percentage of local content achieved during the period of measurement. The weighted averages allowed models containing less than sixty-six percent target of local content to be counterbalanced by other models from the same assembler containing more than sixty-six percent local content. Local content requirements were applied to the range of models assembled by a firm as a whole, and not to individual models.

Targets and definitions for phase VI were different from the first five phases of local content programme. **Value replaced mass as basis for local content requirements**. The value of exports was allowed to count as local content and the value of a manufacturer's turnover became the denominator in the local content calculation. (See Chapter 6 for further discussion of phase VI.)

2.4 SOME DEBATES ON LOCAL CONTENT PROTECTION

The policy of local content protection has generated debate about its necessity and its consequences for the economy. In this section it is proposed to record some of these views, in particular those expressed by South Africans about the South African policy. We begin however with a reference to Latin America.

(1) BERNARD MUNK (1969) (6)

In an article on the automobile industry in Latin America Munk argued that local content protection had a negative outcome on the economy. He was of the opinion that production costs were higher in the developing countries than in developed ones because of local content protection. He claimed that "the more domestic content required, the more expensive these programmes become in terms of resource costs".(7)

In dealing with the efficiency of motor vehicle manufacturers, he quoted the British study of Maxcy-Silberston which pointed out that motor vehicle assemblers need to produce 60 000 - 100 000 units per annum to achieve economies of scale. Other manufacturing processes had access to economies of scale which were only exhausted at higher volumes.(8)

Taking the effect of all processes together, the study pointed out that doubling of output from a level of 100 000 units per year would reduce average costs by 10 percent. Increasing output by another 100 000 units seemed to imply a further reduction in unit costs of 3 percent and a rise to 400 000 units per year would lower unit costs by another 2 percent. These production levels, although derived from the British industry, will be used as a preliminary yardstick in Chapter 4 when examining the performance of the South African motor vehicle industry in which firm output levels are far below these levels.

Munk examined Latin American data and found excess costs which were consistent with the low output levels. Bell has recently queried the continued relevance of Munk's Latin American findings since they refer to a period no later than 1969. (9)

(2) N.J. SWART (1974) (10)

Professor Swart took the view that local content protection was detrimental to the South African economy. He was of the opinion that import and other protection instruments were responsible for the high cost of vehicles. He saw local content protection as

favouring the manufacturers of components against the motor dealer and consumer.

In his evaluation of local content programmes in South Africa, Swart proposed steps that ought to be considered by the government. He argued that the economy would benefit when the government removed protection and allowed price signals to allocate resources. He pointed out that this would make consumers realise the extent of the differences between the costs of domestic and international components and motor vehicles.

(3) ALBERT KELLER (1975) (11)

A similar view that local content protection contributes to the high cost of local vehicles was advanced by Albert Keller. He too, believed that removal of content programmes would eliminate the least efficient firms and also lead to price reductions in the motor vehicle industry in South Africa. He further pointed out that local content protection is responsible for poor quality and late delivery of components. There is evidence which is not consistent with this view, as local vehicle manufacturers point out that local components are of the same quality as overseas components and that they export components to their associated motor companies overseas (see Chapter 6).

(4) R.T. BELL (1989) (12)

A contrary view is held by Professor Bell who believes that excess costs of local sourcing due to local content protection have been much smaller than has been commonly emphasized by other studies dealing with local content protection. He is of the opinion that the manipulation of "deletion allowances" was to a certain extent responsible for price differences between locally produced components and imported ones. Bell revealed the weakness of other studies for failing to devote much attention to the role of the **pricing policies of TNCs** in influencing the prices of imported components. Bell defines deletion allowance as "simply the amount by which the price of the pack of completely knocked down (CKD) imported components is reduced when the component is deleted from the schedule of items included in the pack, when it comes to be sourced locally and

thus is no longer supplied by the TNC ".(13) If the deletion allowances is **below** true cost.the cost comparison with local components is skewed,and the prices of retained imported components are raised **above** cost.

Although Bell is mainly concerned with comparing results under two different methods of measuring local content (viz, by weight and by value), his study also provides general insight into the operations and effect of local content protection (as just illustrated). His conclusion about the main question is that **value content protection would prove superior** on the following basis:

(i) It uses less foreign exchange per vehicle than physical content protection. Saving foreign exchange will influence economic growth favourably.

(ii) Value measurement will increase the profitability of domestic vehicle manufacturers. This is made possible because under value content protection it is less easy to use low deletion allowance to increase the prices charged for imported components by overseas partners in South African joint ventures. The consequences of increased sales and profitability is increased investment in the assembly and component manufacturing industries - making them more internationally cost competitive. (The details of these arguments will be discussed in chapter 6.)

(5) BRIAN KANTOR (1989) (14)

Brian Kantor points out that South African motor vehicles were affordable up to the mid-1980s. He argues that the cost of local vehicles had been increasing at a lower pace than other goods (see Table 3.5 in Chapter 3). This clearly indicates that he does not agree that local content protection resulted in vehicle price inflation when mass was used as basis for local content measurement.

Kantor also concludes that the profitability of the industry is now threatened by the new

(Phase VI) value content requirements. He argues that value content requirements "demand additional investment and the cost of such investment will have to be recovered."

Finally, Kantor concludes that these forced investments will raise prices of local vehicles and the quality will be compromised.

"All South Africans will pay the price for more expensive or poor quality vehicles, irrespective of whether they can afford to own them." (15)

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3. **Ibid**., p.15

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CHAPTER 3

AN OUTLINE HISTORY OF THE MOTOR VEHICLE INDUSTRY IN THE PERIOD AFTER THE COMMENCEMENT OF LOCAL CONTENT PROTECTION,1962-1990

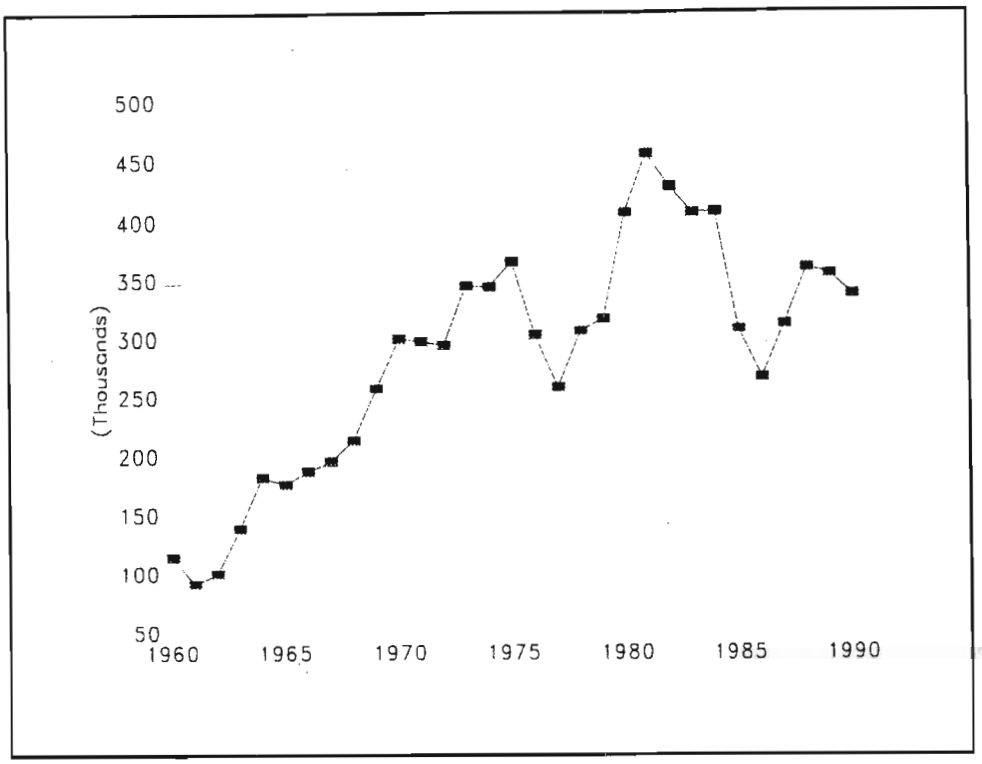
3.1 INTRODUCTION

In this chapter an overview will be provided of the history of the South African motor vehicle industry (including both motor vehicle assembly and component manufacture) in the period after the introduction of local content programmes in 1962. The purpose of the discussion will be to get the main features of the industry's performance clearly set out as a preliminary to the more detailed analysis of Chapter 4 and 5 in which an attempt will be made to relate this performance to the protective policies applied to the industry. **Section 3.2** reports on new vehicle sales; rapid expansion at first and then contraction after the peak of the early 1980s. **Section 3.3** focuses on component manufacturing. **Section 3.4** is concerned with the size of the labour force that was recruited to staff the industry.

3.2 SALES OF NEWLY ASSEMBLED VEHICLES

Annual sales of new passenger cars and light commercial vehicles are separately and jointly presented in Appendix 3A (at the end of the Chapter) and graphed in figure 3.1

FIGURE 3.1 ANNUAL SALES OF NEW PASSENGER CARS AND LIGHT COMMERCIAL VEHICLES, 1960-1990



SOURCE:Constructed from figures presented in Appendix 3A

There was an unambiguous expansionary trend in annual motor vehicle sales from 1961 to 1981. This trend, which in fact commenced in 1950, was no less real for the fact that the expansion was slowing down during the 1970s and was interrupted by a sharp cyclical downturn in 1976 and 1977. It was succeeded by a contractionary trend in the 1980s - so that by 1990 the industry was only registering annual sales at the same level as in the mid 1970s.

Further reference to both figure 3.1 and Appendix 3A, which lists annual changes in the level of sales, confirms the account above. From 1961 to 1980, there were **six years in**

two decades in which sales contracted (on the previous year). And in 1981 to 1990 there were **six years in one decade** in which sales contracted.

Distinguishing (a little arbitrarily - especially in the case of the 1970s) by decades, the growth in sales for cars (only) emerges as follows (1):

1960 - 1970	109 %
1970 - 1980	37 %
1980 - 1990	-24%

It is conceivable, though unlikely, that the contraction after the initial expansion was due to content protection. The argument would have to be that as local content targets were raised through the 1960s and 1970s and again in the 1980s, the excess costs became pronounced, and motor vehicle prices rose relative to those of other commodities, and so annual purchases of new vehicles declined.

In pursuing this hypothesis and seeking to explain more fully the slowing of expansion in the 1970s and the contraction of the 1980s, we need to establish:

(i) What happened to the relative price of motor vehicles over this period.

(ii) Why any changes in the relative price that occurred did take place.

(iii) Whether there were not income (or, budget) changes, in addition to relative price changes, which were equally (or more) responsible.

In fact we shall claim (our data being largely confined to the 1970s and 1980s) that there **were** in the 1980s, but not before, increases in the relative price of motor vehicles; that these cannot be tied with any certainty to local content programmes but rather to other causes, especially changes in real exchange rates; and that the probable major determinants of slow growth and then contraction in sales of cars and commercial vehicles are to be found on the income side: a decline in per capita disposable income and very slow growth of GDP (and associated declines in average business profitability, levels of private investment and so on).

3.2.1 AVERAGE PRICES OF MOTOR VEHICLES 1972-1990

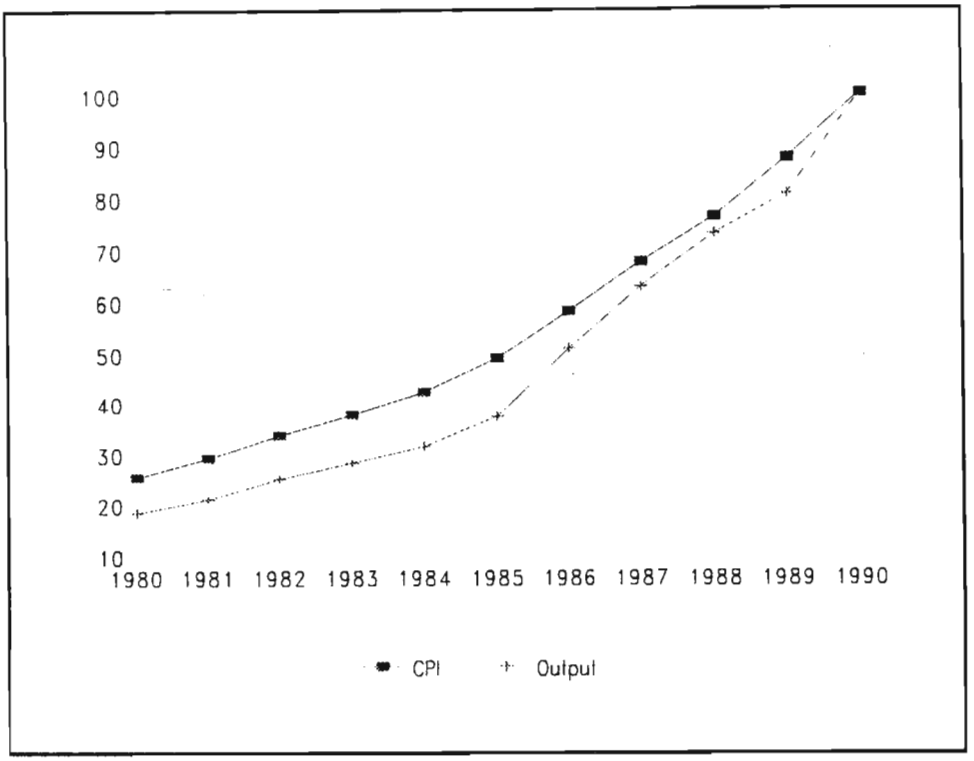
We commence the investigation that leads to these tentative conclusions by examining how the average price of motor vehicles changed in comparison to the general level of consumer prices in the period 1972-1990. The data is presented in Appendix 3B at the end of this chapter. (Unfortunately the data - source used does not distinguish between the prices of motor vehicles and the prices of components produced by the industry, but presents a price index for the aggregate output sold locally by the industry). The average annual compound rates of increase for the price of motor vehicle industry output and for the C.P.I calculated from Appendix 3B, are as follows:

TABLE 3.1 RATES OF INCREASE OF (1) PRICE OF MOTOR VEHICLE INDUSTRY OUTPUT AND (2) CONSUMER PRICES,1972 - 1990 (% p.a)

PERIOD	RATE OF INCREASE OF PRICE OF MOTOR VEHICLE INDUSTRY OUTPUT (% p.a)	RATE OF INCREASE OF C.P.I (% p.a)
1972 - 1980	11.6	11.9
1980 - 1990	18.4	14.7

What is immediately apparent is that while the price of motor vehicle industry output rose at approximately the same rate as general consumer prices in the period 1972-1980, in the 1980-1990 decade it rose somewhat faster i.e. at 18.4 % p.a. compared to 14,7% p.a. Most of the divergence appeared in the second half of the decade after 1985 - with 1986, 1987 and 1990 being years of especially marked divergence (see figure 3.2 and Appendix 3B)

FIGURE 3.2 INDICES FOR (1) PRICE OF MOTOR VEHICLE INDUSTRY OUTPUT AND (2) CONSUMER PRICES, 1980 -1990



Source:Calculated from figures presented in Appendix 3B

Possible explanations of the relative trend in the price of motor vehicle industry output can be found in (1) local content excess costs, (2) changes in exchange rates, (3) quality improvements in motor cars over the period and (4) increases in costs of inputs other than components e.g. wages and capital costs. Of these,the impact of the real depreciation of the rand in relation to other relevant currencies (the second explanation listed above) seems to be the most likely source of increases in the relative price of the general output of the motor vehicle industry and of the assembled motor vehicle in particular. This follows from **the coincidence of timing between the changes.**

There are no grounds for believing that factors (1),(3) and (4) above - if they did influence motor vehicle industry output prices - operated particularly during the second half of the decade which is when,as we have seen, the price associated with motor vehicle output rose faster than the C.P.I. On the other hand that is precisely when a real depreciation of the rand took place against the yen and the Deutschmark. As Bell wrote in a 1990 report on sanctions and the motor vehicle industry "the price of imported CKD material is denominated primarily in DM and yen. Between mid 1984 and the end of 1988 the rand depreciated against these two currencies by 180 and 239 percent, respectively, giving a weighted average of at least 210 percent for the motor industry. Thus, even at constant DM and yen prices, the rand cost of CKD material would have risen on average by at least this amount" (2). That this increase in the rand cost of imported components used in the motor assembly industry (compared to a 120 percent increase in the cost of locally produced components (3)) would have substantially raised the rate of increase of motor vehicle prices is suggested by the fact that in 1984 imported components comprised 51.4 percent by value of all components used in motor assembly and 36 percent of vehicle sales turnover (4).

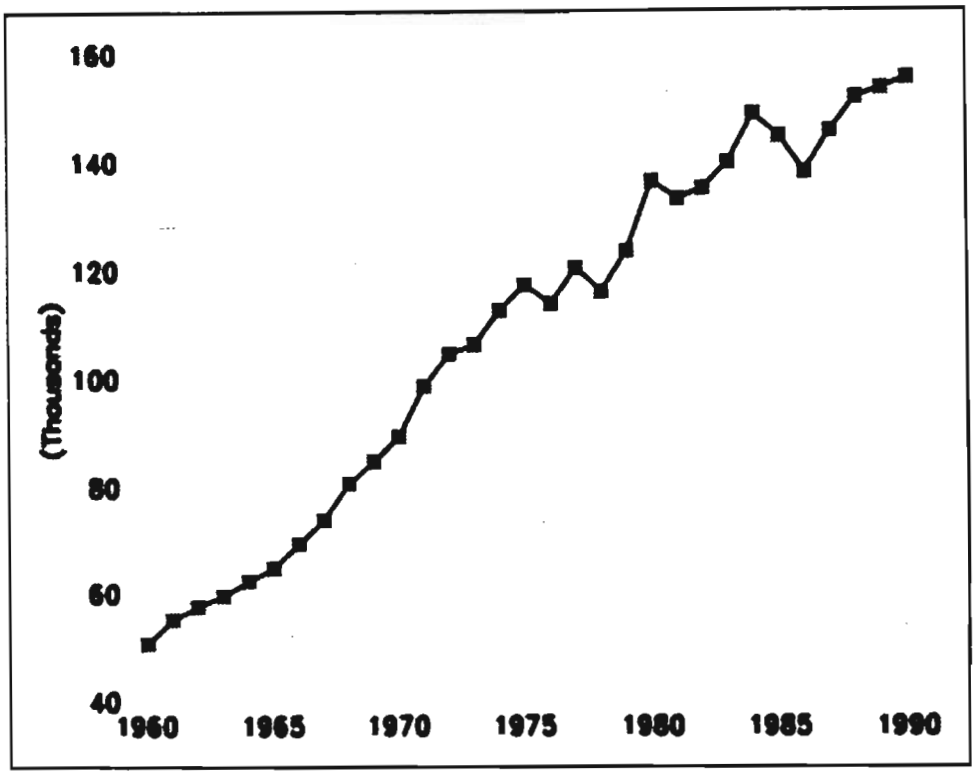
At any rate, whatever the explanation of the rise of motor vehicle prices relative to the general price of consumer goods during the 1980s, there is no doubt that it did take place - and that in terms of basic consumer theory we should expect this to have led **cet. par.** to some contraction in demand.

3.2.2 DECLINING PER CAPITA INCOMES AND THE DEMAND FOR MOTOR VEHICLES

In fact during the 1980s income changes took place which we would expect on theoretical grounds to have reinforced the contraction of demand for motor vehicles caused by a rise in their relative price. The growth rate of real GDP in South Africa collapsed in the 1980s - and the growth of personal income with it. Aggregate real personal disposable income (see Appendix 3C at the end of the Chapter and fig.3.3) grew by about 80% during the 1960s, by about 50% during the 1970s and by not much more than 10% during the 1980s. Clearly the rate of growth of aggregate personal income was slowing down in trend terms

across these 3 decades. The full implications of this become apparent if we translate into real personal disposable income **per capita** (fig 3.4)

FIGURE 3.3 REAL DISPOSABLE PERSONAL INCOME (1990 PRICES)



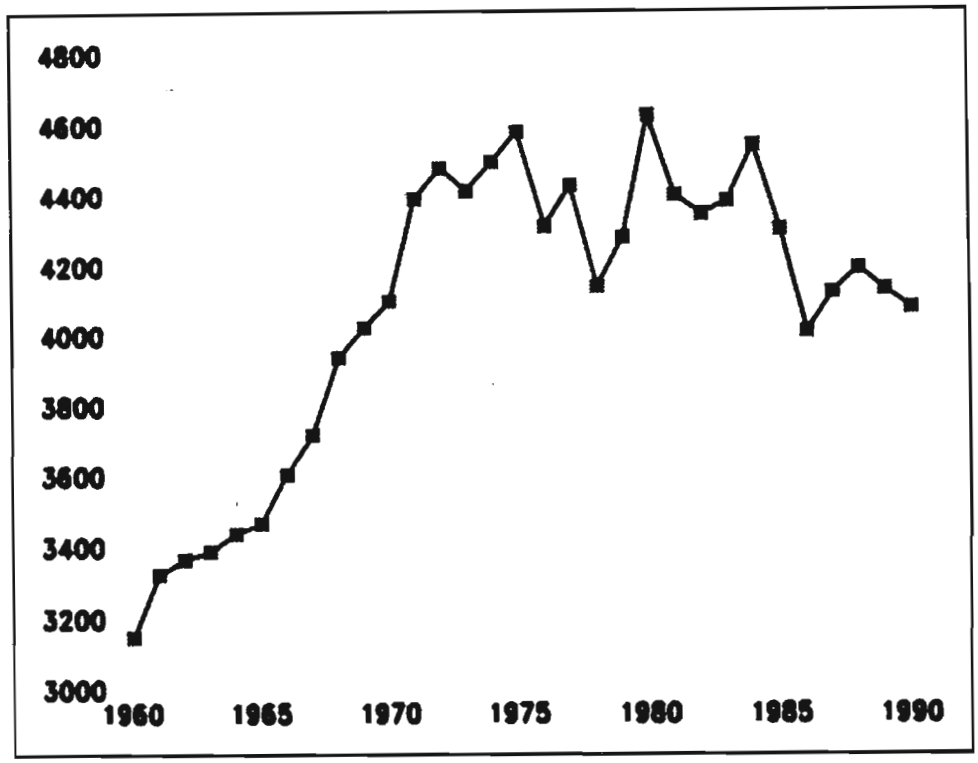
Source:Constructed from figures presented in Appendix 3C

* Note that the unit on the vertical axis is a thousand million rands.

There are some problems with figures for the growth of the South African population in recent decades - because the TBVC states were omitted from recent censuses. If we take a short cut and work with a population growth rate of 2,7% p.a during these decades, it is clear that real personal disposable income per capita grew at close to 3% p.a. during the 1960s, at about 0,8% p.a. during the 1970s, but **declined** at an average rate of 1,7% p.a. during the 1980s(or by roughly 20% over the decade) (5).

A graphical presentation of these trends is shown in fig 3.4 - using population estimates produced by the Development Bank and splicing them to population figures for years before.and subsequent to, TBVC independence (6).

FIGURE 3.4 REAL PERSONAL DISPOSABLE INCOME PER CAPITA (1990 PRICES)



SOURCE: Constructed from figures presented in Appendix 3D

Note that the unit on the vertical axis is a (1990) rand per person.

A fall in real personal disposable income **per capita** on this scale will obviously have negatively affected the demand for new passenger vehicles, and this will have been reinforced by a decline in demand for commercial vehicle due to the slow growth of GDP, the fall in profitability of investment and the decline during several years of real Gross Domestic Fixed Investment.

The point of this section (3.2) has been to show that local contents programmes were launched within the context of expanding motor vehicle sales - but that this expansion went into sustained reverse in the 1980s with negative consequences for component suppliers.

3.3 COMPONENTS AND COMPONENTS MANUFACTURE

The time-profile of new motor vehicle production is a pre-requisite for the study of components production - but there are other factors that require attention viz. the "aftermarket" for components, and the timing of local content policy. There are two sources of demand for components, first as original equipment (OE) for use in the assembly of new motor vehicles, and secondly, for use in the repair and maintenance of the existing stock of motor vehicles (the aftermarket). It has not been possible to distinguish between these two sources of demand in the statistical time series of production of components. This is unfortunate because in the 1980s there is some evidence that the series for (i) new motor vehicles and for (ii) motor vehicle parts and accessories behaved with some independence. It would be interesting (but not feasible) to try to relate this divergence to the influence of the "aftermarket". What we can do is to show (i)that the **overall** pattern of expansion and contraction which marks motor vehicle production is also reflected in components production (section 3.3.1) and (ii) that there is a spurt of fast growth in the output of components in the 1960s and 1970s as local content targets were set and raised (section 3.3.2).

3.3.1 EXPANSION AND CONTRACTION

In general real output in the motor vehicle industry follows the time-profile of new vehicle production. An index of the industry "contribution to GDP" (at 1980 prices) registers 21 in 1960, 53 in 1970, 100 in 1980, 65 in 1985 and 76 in 1990 (7). A long expansion is seriously interrupted in the 1980s - after a peak in 1981 (index =124). This implies that whatever was happening to component production was not seriously offsetting the decline in motor vehicle production during the last decade. We can in fact be a little more precise about component production.

An index of the physical volume of production in components (narrow definition) stands at 100 in 1980, peaks in 1982 at 134 and declines precipitately in 1985 to 68. An index for a slightly wider definition of components (converted to the same 1980 base) does not go beyond 80 in the remainder of the decade (8).

3.2.2 RAPID INITIAL EXPANSION OF COMPONENT MANUFACTURING UNDER LOCAL CONTENT PROTECTION

Within the general conformity of component manufacturing output over time to the leadership of the output of new vehicles, it is possible to discern a period in the 1960s and 1970s **when component production grew much faster than the output of new assembled vehicles** - in response to the local content schemes introduced (and targets imposed) after 1962. An index of the physical volume of manufacturing production for the overall motor vehicle industry (which distinguishes (a) motor vehicles,(b) caravans, trailers and vehicle bodies and (c) motor vehicle parts and accessories with base year 1963-4 = 100) is available for 1963-4 to 1977, which is the period we are interested in. The various series peak either in 1974 (parts) or 1975 (vehicles and trailers etc.). At the peak levels the production index (1963-4=100) had reached 650,3 for parts, 262,9 for caravans and trailers, and 199,0 for motor vehicles (with the overall industry index peaking at 277,9 in 1974). In the period after the mid-to-late 1970s (the local content target by weight was not raised after 1976) this rate of growth differential disappears. While it lasted, however, output of parts grew at around 20% per annum (19,5% per annum for the 1963/4 to 1974 period, and 21,8% per annum if we take the starting point back to 1956/7) (9).

3.3.3 THE SIZE OF THE COMPONENTS INDUSTRY

Since component production was expanding at a faster rate during the 1960s and 1970s than the production of the other sections of the overall motor vehicle industry, we should expect its share of the value of output to have risen. This seems to have happened if we use the weights used to aggregate output as an

indication of the relative value of output sub- totals. In the mid-1950s the overall motor industry produced just under 4% of total manufacturing output by value,and in the mid-1980s the figure was just under 5%. During this period the share (relative weight) of components had risen from about 11% to a little under 42% (10).

3.3.4 SOME ASPECTS OF THE BUSINESS HISTORY OF THE COMPONENTS INDUSTRY

There is some information available about the industry - of a less statistical and more descriptive nature. What we shall present here is in no sense a thorough coverage of the business and technical history of the industry - but the detail may nonetheless be of interest and will raise a few interesting questions.

Before local content schemes were introduced in the early 1960s, there was some local manufacture of components - a range of "hang on" parts (such as batteries and light bulbs and high volume replacement parts, including rubber tyres). There was some foreign investment by e.g. Bosal Afrika (Dutch), Lectrolite and Dunlop (British).

According to Duncan, growth in the component sector only really took place after local content requirements were introduced (11). Growth and investment in this sector are suggested by the following.

(i) Accumulated capital investment in the "parts sector" was R15 million in 1960.

(ii) The value of capital stock had risen to R85m by 1967 (on some estimates) after the initial content target was set at 55% by mass by 1969.

(iii) Most major investments in the 1960s were made by British,American and South African firms. Usually projects were financed by a combination of

foreign and local capital. An example in the mid 1960s was the partnership of Guest,Keen and Nettleford (British) and Anglo-Transvaal (South Africa) to build a R4m plant to " forge steel and alloy components" at Uitenhage.

(iv) Further large investment outlays in the 1960s were made by Repco-Wispeco, Ruberowen, Borg-Warner, Thompson Ramco and United Paints. Altogether there were some 200 component companies by the late 1960s or early 1970s.

(v) Expansion in component manufacturing capacity by **assemblers** also took place in the 1960s. (There were then more assemblers than the current 7).

(v) The local content target for the 1970s was set at 66% (by mass) for 1977. Datsun-Nissan and Toyota announced engine plants (R2,5m) in 1971.

(vii) The South African government provided finance **via** the Investment Development Corporation:

(a) R13,5m for a plant at Alberton manufacturing engine blocks, heads, crankshafts and camshafts for the industry as a whole, and

(b) R4m for the production of malleable iron in Port Elizabeth for use in the fabrication of housings, hubs and other components.

(viii) Total investment in the component sector was estimated to be R160m in 1974 by Nic Swart (a rough doubling in current values over 7 years since 1967). The component industry itself put the figure at R224m the next year (1975).

(ix) There was increased investment in the South African market by German assemblers such as V.W, Daimler-Benz and BMW in the 1970s. They

increased their ownership stake in plants which had formerly operated as licensees. "Directly and indirectly" (Duncan) they encouraged major German component manufacturers e.g. August Laepple and Robert Bosch to open large facilities in South Africa. Some older British and American companies closed down or sold off holdings. South Africa mining and financial houses increased their holdings in both components and motor assembly.

(x) The distribution of component manufacturing between assemblers (in plant) and independent firms is presented in Appendix 3F at the end of this chapter (though the data refers only to components produced as original equipment). This evidence for the mid 1970s (the report is dated 1977) indicates that one fifth (22,17%) of locally produced components by mass were then produced in assembler's plants (the remainder of just under 80% was produced by other firms of which there were approximately 300). Local production comprised 67,33% of vehicles by mass.

(xi) Disinvestment and withdrawals (given the stagnant market of the 1980s) by some of the assemblers, and the growth of the German manufacturers led some British, American, French and Italian firms in the component sector to close up or sell out. (12)

On the other hand, a smaller number of American, Canadian and Swedish companies (Gabriel, EDE,SKF) continued their operations in the component sector, with the British retaining ownership of some large firms such as Lucas and Turner and Newall. As mentioned above the Germans were involved in a broad range of components (13).

(xii) An important point mentioned by Duncan is that the formal and informal linkages between overseas assemblers and their component suppliers (whom they often induced to set up here) led to "lack of rationalisation "

and "unnecessary duplication" in the component industry. Evidence for this claim can be found in the NAACAM Directory of 1991. It lists the number of producers of some components as follows (14):

(a) 8 firms manufacturing seats and frames.
(b) 10 firms manufacturing plastic mouldings.
(c) 15 firms manufacturing metal pressings.

(xiii) Some commentators expect that the switch from mass to value and allowing exports to count as local content (phase VI) will result in less local components in cars. Duncan argues that : " the sudden removal of protection for relatively low cost, heavy components naturally threatens the companies which produce them not to mention workers in the parts sector" (15). He predicts that there will be a "shrinkage" of the parts sector to a narrower, higher-value components and export-focused base (16). We shall return to this question briefly in Chapters 6.

3.4 EMPLOYMENT

Employment in the motor vehicle industry as a whole grew along with output in the expansionary phase of the industry. It more or less doubled in the 1950s, more than trebled in the 1960s and grew by close to 50% in the 1970s. During the 1980s it levelled out across the decade - or, looked at differently, declined from its 1982 peak.(17)

The influence of components in the expansion of employment is fairly clear in the rapid growth of the labour force in the 1960s and early 1970s. Over the 1962-1976 period from the commencement of local content requirement the labour force in the overall industry grew at about 10% per annum. According to Duncan the labour force in components had more or less equalled the labour force in motor assembly by 1973, and by 1989 had double its size (73 000 as against 37 000) (18). These figures (1989) do not entirely correspond with the official (CSS and IDC) figures - being rather too high. They yield an

industry total of 110 000 against the IDC's 80 100 (see Appendix 3E). However Bell reports the same figures as Duncan (37 000) for assembly in 1989, and 60 000 workers "directly in components" - yielding an aggregate of 97 000 for 1989 (19). Since 1960 then, when Duncan suggests that the labour force in components was of " miniscule proportions", between 43 000 and 73 000 jobs (20) have been created in components, depending on where one draws the line of classification between the motor vehicle and other industries.

REFERENCES

1. These calculations involve overlapping boundary-years.A similar procedure was followed for Table 3.1.

2. Bell, Trevor (1990), "A case study of the impact of sanctions on the South African motor vehicle industry"in Charles M.Becker,Trevor Bell,Haider Ali Khan and Patricia S. Pollard, **The Impact of Sanctions on South Africa,Part I,The Economy**,Washington, D,C.: Investor Responsibility Research Center, March 1990:p.84.

3. **Ibid**.

4. **Ibid**., p. 59

5. These are rough calculations designed to indicate orders of magnitude.

6. Development Bank of Southern Africa

7. Industrial Development Corporation of South Africa, Ltd., Dept of Economic Research and Development, **Bruto Binnelandse Produk,Kapitalvoorad en Werkgeleentheid(Waardes, Verhoudings en Indekse)**, Sandton, July 1988: sector 24.

8. Central Statistical Services (1992), **South African Statistics 1992**, Pretoria: Government Printer, pages 12.66 and 12.68. Also **South African Statistics 1986**.

9. Department of Statistics, **South African Statistics 1978** (pages 12.54 and 12.56), **South African Statistics 1974** (page 12.47), **South African Statistics 1970** (page M - 40), Pretoria: Government Printer. For the period back to 1956/57 see Bureau of Statistics, **Statistical Year Book 1965** (page M - 52) and **South African Statistics** volumes for **1966** (M - 50) and **1968** (M - 47).

10. Central Statistical Services, **South African Statistics 1992**, Pretoria:Government Printer,pages 12:66 and 12.68; Bureau of Statistics, **Statistical Year Book 1965**, Pretoria: Government Printer, M - 52.

11. Duncan, David (1992)," Foreign and local investment in the South African motor industry 1924-1992", **South African Journal of Economic History**, vol. no.2, September 1992,p.60. Most of the historical material for this section (3.3.4) is drawn from this source.

12. **Ibid**.,p. 60

13. **Ibid**.,p. 63

14. **Ibid**.,p. 68

15. **Ibid**.,p. 58

16. **Ibid**., p. 77

17. Industrial Development Corporation (1988), **op.cit**.; also Industrial Development Corporation (1992) - see Appendix 3E.

18. Duncan (1992), **op.cit**., pp.56-57.

19. Trevor, Bell (1990), **op.cit**., p.76.

20. Lower estimate :80 100 (IDC) - 37 000 (Duncan,Bell) = 43 000. Upper estimate : Duncan reports 73 000 directly.

APPENDIX 3A ANNUAL SALES OF NEW PASSENGER CARS AND COMMERCIAL VEHICLES

YEAR	CARS	COMMERCIAL VEHICLES	TOTAL	% CHANGE
1960	96508	17023	113531	
1961	74427	16087	90514	20.27
1962	80901	18117	99018	9.40
1963	110243	27639	137882	39.25
1964	143031	37881	180912	31.21
1965	127659	47093	174752	-5.66
1966	138835	47074	185909	6.38
1967	139223	54820	194043	4.38
1968	151546	60245	211791	9.15
1969	177945	78351	256296	21.01
1970	201854	95719	297573	16.10
1971	175884	119798	295682	0.63
1972	182961	109316	292277	-1.15
1973	229442	112941	342383	17.14
1974	226776	115151	341927	-0.13
1975	229031	134574	363605	6.33
1976	185132	115116	300248	-17.42
1977	166764	90037	256801	-4.47

APPENDIX 3A CONTINUED

1978	204736	98959	303695	18.26
1979	213270	100797	314067	3.42
1980	277058	127708	404766	28.88
1981	301528	152013	453541	12.10
1982	283433	142690	426123	-6.04
1983	272822	132317	405139	-4.92
1984	268751	137059	405810	0.16
1985	204322	101005	305327	-24.76
1986	174453	90223	264676	-13.31
1987	200824	108326	309150	16.80
1988	230500	127393	357893	15.77
1989	221342	131287	352629	-1.47
1990	209608	125171	334779	-5.06

Source:Industrial Development Corporation of South Africa,Ltd.,Department of Economic Research and Development, **Sectoral Data Series-Manufacturing:Subsection 24 - Motor Vehicles**,Sandton,1992.

APPENDIX 3B: COMPARISON OF CHANGES IN CONSUMER PRICE INDEX AND INDEX OF MOTOR VEHICLE PRICES, 1980-90

YEAR	C.P.I	%CHANGE	PRICE OF MOTOR VEHICLES	%CHANGE
1980	25.5		18.5	
1981	29.3	14.9	21.2	14.6
1982	33.7	15.0	25.1	18.4
1983	37.8	12.2	28.2	12.4
1984	42.2	11.6	31.4	11.3
1985	49.1	16.4	37.5	19.4
1986	58.2	18.5	50.9	35.7
1987	67.6	16.2	62.8	23.4
1988	76.3	12.9	73.1	16.4
1989	87.5	14.7	80.6	10.3
1990	100.0	14.3	100.6	24.1

Source:Econometrix (Pty)Ltd

APPENDIX 3C PERSONAL DISPOSABLE INCOME

(CURRENT PRICES AND 1990 PRICES)

YEAR	PERSONAL DISPOSABLE INCOME AT CURRENT PRICES (RAND MILLIONS)	CONSUMER PRICE INDEX 1990=100	PERSONAL DISPOSABLE INCOME AT 1990 PRICES(RAND MILLIONS)
1960	3519	7.0	50271
1961	3886	7.1	54732
1962	4169	7.3	57110
1963	4389	7.4	59311
1964	4652	7.5	62027
1965	5028	7.8	64462
1966	5597	8.1	69099
1967	6098	8.3	73470
1968	6819	8.5	80224
1969	7352	8.7	84506
1970	8191	9.2	89033
1971	9634	9.8	98306
1972	10836	10.4	104192
1973	12062	11.4	105807
1974	14217	12.7	111944
1975	16810	14.4	116736
1976	18131	16.0	113318

APPENDIX 3C CONTINUED

1977	21342	17.8	119899
1978	22884	19.8	115576
1979	27595	22.4	123192
1980	34710	25.5	136118
1981	39067	29.4	132881
1982	45393	33.7	134697
1983	52696	37.8	139407
1984	62556	42.2	148237
1985	76760	49.1	144114
1986	80106	58.2	137639
1987	98091	67.6	145105
1988	115248	76.2	151244
1989	133674	87.4	152945
1990	154888	100.00	154888

Source:PDI(Current Prices)- **South African Reserve Bank Quarterly Bulletin, Supplement June 1991(South African National Accounts, 1946-1990)**

CPI-CSS:**SA Statistics 1992**

APPENDIX 3D: REAL PERSONAL DISPOSABLE INCOME PER CAPITA (1990 PRICES)

YEAR	PDI AT 1990 PRICES(RAND MILLIONS)	POPULATION 1960 - 1990	PDI PERCAPITA 1990 PRICES(RANDS)
1960	50271	16003000	3141.3
1961	54732	16497492	3317.5
1962	57110	17007264	3357.9
1963	59311	17532788	3823.8
1964	62027	18074551	3431.7
1965	64462	18633054	3459.5
1966	69099	19208815	3597.2
1967	73470	19802367	3710.1
1968	80224	20414260	3929.8
1969	84506	21045060	4015.4
1970	89033	21762118	4085.2
1971	98306	22434567	4381.8
1972	104192	23309515	4469.9
1973	105807	24029779	4403.1
1974	111133	24772299	4486.1
1975	116736	25537763	4571.1
1976	113318	26326879	4304.2
1977	119899	27140379	4417.2

APPENDIX 3D CONTINUED

1978	115576	27979016	4130.8
1979	123192	28843567	4271
1980	136118	29491076	4615.6
1981	132881	30266691	4390.3
1982	134697	31062704	4336.2
1983	139407	31879653	4372.9
1984	148237	32718087	4530.7
1985	144114	33581809	4291.4
1986	137639	34407331	4000.2
1987	145105	35277474	4113.2
1988	151244	36174147	4180.9
1989	152945	37098326	4122.6
1990	154888	38051131	4070.2

SOURCE:PDI(Current Prices)-**South African Reserve Bank Quarterly Bulletin,Supplement June 1991(South African National Accounts, 1946-1990)**.

CPI-CSS:**SA Statistics 1992**.

Population - CSS:**SA Statistics 1992**; J.M Calitz and M.J. Grove, **Regional Profile of the Southern African Population and its urban and Non-Urban Distribution, 1970-1990**, Development Bank of Southern Africa,1991.

APPENDIX 3E MOTOR VEHICLE EMPLOYMENT

YEAR	WHITES	COLOUREDS	ASIANS	BLACKS
1972	18960	12630	1040	24880
1973	19320	13690	1340	26880
1974	20210	14020	1550	30810
1975	21310	14190	1950	33390
1976	21840	14460	2070	36080
1977	21150	13410	2320	33440
1978	24140	13700	2410	34450
1979	20800	14260	2430	35810
1980	20430	14390	2600	42790
1981	21060	16950	2930	49310
1982	22140	16740	2910	54470
1983	22610	15060	2540	49330
1984	23840	16250	2710	47650
1985	23160	15280	2560	43840
1986	20580	13630	2790	44200
1987	20200	13430	2730	43750
1988	20700	13600	2880	42800
1989	21100	13900	3000	42100
1990	21600	13900	3100	43500

Source:Industrial Development Corporation of South Africa, Ltd., Department of Economic Research and Development, **Sectoral Data Series - Manufacturing: Subsection 24-Motor Vehicles**, Sandton,1992.

Note:This Table is reproduced as Table 5.1 on p.95. That Table includes a 'total' column.

APPENDIX 3F: LOCAL PRODUCTION OF COMPONENTS AS ORIGINAL EQUIPMENT FOR MOTOR CARS - JANUARY TO JUNE 1976 FOR 24 MODELS.

COMPONENT CATEGORY	'000 KG		% BY MASS OF VEHICLES	% PRODUCED IN PLANT
	IN PLANT	TOTAL		
BODY PRESSING	4250	11471	17,44	3,33
ENGINES	2843	5382	7,29	2,74
WHEELS AND TYRES		5246	7,93	
SOFT TRIM	1327	4282	6,82	1,79
SUSPENSION	690	3264	4,87	0,59
TRANSMISSION AND REAR GEAR	129	2573	3,20	0,20
STEERING SYSTEM	66	247	0,34	0,05
GLASS		2189	3,30	
ELECTRIC SYSTEM	140	1900	2,97	0,06
HARDWARE	91	1363	2,32	0,07
BRAKE SYSTEM	165	1986	2,76	0,12
EXHAUST SYSTEM	67	852	1,25	0,04
COOLING SYSTEM	77	557	0,75	0,04
FUEL SYSTEM	144	573	0,84	0,14
HEATER AND VENTILATION	125	272	0,34	0,06
MISCELLANEOUS	41	3639	4,91	0,03
TOTALS	10155	45790	67,33	9,26

TOTAL MASS 24 MODELS	68 008 (based on 66049 vehicles)
MASS PRODUCED IN SOUTH AFRICA	45 790
MASS PRODUCED IN VEHICLE PLANTS	10 155
% IN PLANT OF TOTAL LOCAL PRODUCTION	22,17%
% OF VEHICLE PRODUCED IN PLANT	9,26%

SOURCE: B.T.I, 1977 REPORT NO. 1777, p.9

CHAPTER 4

THE COSTS OF LOCAL CONTENT PROTECTION IN SOUTH AFRICA

4.1 INTRODUCTION

This chapter looks at whether the motor vehicle industry in South Africa under local content protection has experienced substantially higher costs of production than its traditional overseas component suppliers. The existence of such excess costs are implicit in the policy of local content protection and their presence is assumed in the simple models presented in Chapter 1, section 1.5. They are the consequences of lower factor productivity than is attained in technically and organisationally more advanced countries. A frequently cited source of such costs, which is not referred to in Chapter 1.5, is the failure to achieve economies of scale in production. Pursuing this last point, **section 4.2** below examines the concept of economies of scale and the evidence for their existence in the motor vehicle assembly and component manufacturing industries. **Section 4.3** documents the fact that scales of production in the South African motor vehicle sector are small by comparison with those of major world producers. **Section 4.4** contains a discussion of whether, despite small scale of production, the South African industry has lower excess costs than is often supposed - either because of learning effects over time, or because of new technologies and methods of production organisation which have reduced economies of large scale or offset them to some extent. The section concludes by noting Bell's surprising claim that if there are excess costs, they may have more to do with the pricing policies of overseas suppliers of components than with the local sourcing of components.

4.2 ECONOMIES OF SCALE

A major reason for asserting that there will be excess costs associated with content protection and local sourcing of motor vehicle components in cases such as that of South Africa is the belief that there are significant economies of scale associated with the main production processes involved, and that these will be lost if the typical plant or equipment

is operated below the minimum efficient scale (or designed to operate at below what is known to be the minimum efficient scale).

4.2.1 GENERAL EVIDENCE OF ECONOMIES OF SCALE AT PLANT LEVEL IN MANUFACTURING

The extent of the existence of plant level economies of scale depends on factors such as specialisation and division of labour in production, the existence of indivisibilities and economies of increased physical dimensions of some equipment (1). The indivisibility argument stresses that at a given point in time certain basic items of industrial equipment may be available only with a limited number of capacities (or sizes). There will be diminishing unit costs for each size of equipment as output is increased towards its full capacity level of operation.

General empirical evidence for the existence of economies of scale at plant level in manufacturing is reported by many authors, including Hay and Morris (2). They quote a study by Haldi and Whitcomb on manufacturing costs in the United States (published in 1967). An equation of the form:

$$C=aX^b$$

where C is cost, X is capacity and a and b are constants, was fitted to cost data at various levels of aggregation. Increasing returns (or decreasing costs) are present when $b<1$ (or $b< 0.9$ in the empirical work reported). These researchers found such increasing returns for 90% (618/687) of different types of basic industrial equipment, 84% (186/221) of complete plant investment costs, and 100% (32/32) of cases where total plant operating costs were studied (as distinct from investment costs).

Pratten is reported to have approached the same issue by seeking to determine what the minimum efficient scale (MES) was i.e. that scale "at which costs become constant, further economies of scale being negligible"(3). He worked with U.K. data for over 20 manufacturing sectors. Results were published in

1971. They indicate that the cost disadvantage of smaller plants (50% MES) is relatively small in the majority of sectors, reaching 10% in only a quarter of the cases (4). For motor cars (presumably assembly) MES was 25% - 50% of the U.K market, but the percentage cost increase for a plant of 50% MES was only 6%.

4.2.2 EVIDENCE ON EXCESS COSTS (DUE TO LOSS OFECONOMIES OF SCALE AMONG OTHER REASONS) IN LATIN AMERICAN MOTOR ASSEMBLY AND COMPONENT MANUFACTURE.

An early study of the "welfare costs of content protection" in Latin America was made by Bernard Munk (5). In addition to his main findings for Latin America, he made use of information about the British car industry in the 1950s which sheds light on the contribution of component manufacturing (as distinct from assembly) to the variation of costs with scale. We turn first to this latter question.

Munk lists the four (basic) processes involved in producing and assembling motor vehicles as (i) assembly (ii) casting and forging (iii) machining and (iv) stamping. The British industry study suggested that MES (minimum efficient scale) increased as one moves through the list of basic process from (1) to (iv) above.

- Assembly : 60 - 100 000 units per annum (need not all be one model).

- Foundry operations (casting and forging) : about 100 000 units per annum (need not all be one model).

- Machining of parts : economies still being realised into the range of about 500 000 units per annum.

- Stampings : average cost of some stampings goes on falling to at least 1 million units per annum.

The reduction in average costs with increased scale is basically due to processes (ii), (iii) and (iv). If one puts the four together and considers the average total cost

curve for the manufacture and assembly of the final vehicle, there are cost reductions to be obtained above 100 000 units per annum - as shown below in Table 4.1

TABLE 4.1 AVERAGE COSTS AND SCALE OF MOTOR VEHICLE OUTPUT (ALL PROCESSES)

OUTPUT	INDEX OF AVERAGE COSTS	REDUCTION IN AVERAGE COSTS
100 000	100.0	
		10
200 000	90.0	
		3
300 000	87.3	
		2
400 000	85.6	

SOURCE : MUNK (1969), (6)

Quadrupling output from 100 - 400 000 units per annum would on this view lower average costs by slightly less than 15%. If 400 000 units were the MES, operating at 100 000 units would raise costs by about 18%. What the figures do not tell us is what would happen to costs at a scale well below 100 000 units - which was the relevant scale, since in 1964 only 2 firms in Latin America had an annual output in excess of 50 000 units.

Given the scanty data on costs and especially costs of very small-scale operation, Munk's achievement was to assemble data of his own on costs of an American firm operating in Argentina, Mexico and Brazil as well as at home in the U.S.A. On the basis of this information he estimated the excess costs of producing vehicles in those countries subject to vehicle protection and content protection. His results show that costs (adjusted for local taxes) were loosely 30 - 40 % in excess of the c.i.f. cost of supplying vehicles from U.S.A. (see Table 4.2)

TABLE 4.2 EXCESS COSTS AS PROPORTIONS OF C.I.F. COSTS

COUNTRY	ADJUSTED*	UNADJUSTED
ARGENTINA		
Small car	0.32	0.87
Light truck	0.16	0.67
BRAZIL		
Light truck	0.17	0.17
MEXICO		
Small car	0.39	0.47
Large car	0.43	0.51
Light truck	0.38	0.46

Source : MUNK (1969) (7)

*Adjustment is for an estimate of the amount of domestic taxes paid by the company and /or the component suppliers from whom the company bought finished or unfinished materials. Hence the "adjusted"column is of chief interest.

Munk's interpretation of these results is that at the time of research (in 1960s), 30% was a "reasonable first guess " at the size of the "implicit tax" imposed by local content programmes "in their initial stages" on their domestic economies.(8) Conceivably part at least of their excess costs was the result of the loss of economies of scale. Interestingly, however, Munk did not push this point hard. Some of his comparative data for individual components (reported here) led him to suggest that Brazil was a relatively low - cost producer, Argentina relatively high-cost, with Mexico somewhere in between. (In fact such a view is compatible with Table 4.2 as concerns Brazil and Argentina). Since Brazil and Argentina at that stage had roughly similar output levels, with Mexico about half their scale, it is clear that the influence of scale on costs was either small or outweighed by other factors. Munk hypothesised that there was some tendency for costs to fall over time - if "learning" is taking place. This would fit his evidence, since Brazil (which in relation to the production of light trucks had negative excess costs relative to the U.S. - see Table 4.2) had introduced local content programmes before any of the others.

4.2.3 MORE RECENT EVIDENCE (AND CONTROVERSY) ABOUT ECONOMIES OF SCALE IN MOTOR VEHICLE PRODUCTION ESPECIALLY IN DEVELOPING COUNTRIES.

4.2.3.1 The world-wide motor vehicle industry has experienced deep change in recent decades. Jones and Womack (1985)(9) claim it has experienced three "major transformations" (out of four in its whole history) since the late 1950s. Despite these changes it seems to be widely agreed that the industry is still marked by economies of scale.

Thus Waverman and Murphy (1992) (10) were able to write very recently that " ..... automobile production is a classic example of an industry with substantial scale economies". Moreover they asserted the truth of the proposition we are investigating for South Africa in this chapter viz. "hence it has often been argued and demonstrated that import substitution policies **raise the costs of production**, lower productivity, and **substantially raise domestic prices**"(my emphasis) (11). However there has been some dispute over whether or not some of the recent organisational and technological changes in the industry have **reduced the extent** of economies of scale in the sense of reducing the minimum efficient scale of product runs and production plants.

4.2.3.2 Japanese methods for the organisation of production (called **"lean production**" by Womack, Jones and Roos (1990)) (12) and the application of micro-electronics to production technology are associated with greater "flexibility". As Alcorta (1994) (13) writes : "The increasing replacement of mass production, specialized single-purpose, fixed equipment by computer aided design and engineering capabilities and flexible manufacturing systems, has allowed firms to produce a **larger variety** of goods in **smaller batches** and less time" (my emphasis). This greater flexibility is believed by some to imply lower "optimal" scales of production. In Alcorta 's summary (14) : "contrary to the previous mass production technological paradigm where increasing scales were crucial to cost reductions, the flexibility of new technologies is said to provide opportunities to

switch production between products and so **reverse the tendency towards greater scale**" (my emphasis). These claims have been made for a range of industries. A robust statement of a similar view for the motor vehicle industry in particular has been made by Jones and Womack (15) ".....the fourth transformation does **lower the economies of scale thresholds in automobile and component productions** so that countries with domestic markets traditionally thought too small to support an automobile industry might have adequate scale in the future".(my emphasis).

4.2.3.3 Alcorta's review and assessment of these "descaling " claims is negative. He concludes that "while optimal product scales may be falling this is not the case for plant and possibly also firm scales, which seem to be increasing".(16). Similar conclusions are reported by a study of the Bureau of Industry Economics on the effect of microelectronics on scale in the Australian motor vehicle industry.(17)

4.2.3.4 The view that economies of scale (at **plant** level) are substantial- and are not falling, is firmly, though reluctantly, endorsed by Black and Kaplan (1993) (18) for South Africa. They do allow however that the economies of scale are less in assembly than in component manufacture - as we have seen - and also that new technologies have made it possible for a single plant to manufacture a wide range of components efficiently.

4.2.3.5 Table 4.3 below summarises the findings of the Australian study referred to above about minimum efficient scale in major components.

TABLE 4.3 ESTIMATES OF MINIMUM EFFICIENT SCALE IN WORLDWIDE COMPONENT PRODUCTION

COMPONENT/PROCESS	MINIMUM EFFICIENT SCALE/OUTPUT PER ANNUM
Engine block castings	260 000 - 1 million
Engine block machining	150 000 - 600 000
Engine assembly	100 000 - 500 000
Transmission/gearboxes	260 000 - 500 000
Stampings*	1 million - several millions
Body Unit	200 000 - 400 000
Frame	200 000 - 206 000

Source: Derived from Bureau of Industrial Economics (1988) and reproduced in Black and Kaplan (1993).(19) *Could be much less in the case of low volume dies.

We turn now to study what scale is, and has been, in the South African industry.

4.3 SIZE OF THE SOUTH AFRICAN MARKET FOR MOTOR VEHICLES AND COMPONENTS

An output level consistent with economies of scale in assembly, as outlined in the British study cited by Munk, is 60 000 units per annum. We will use this output level to indicate whether South Africa is reaching the minimum efficient scale in motor assembly or not. For components we will refer to the estimates in Table 4.3.

4.3.1 MOTOR ASSEMBLY

The South African motor vehicle industry suffered a serious and drastic decline in car sales between 1980 and 1990 (see section 3.2 and Appendix 3A). The Board of Trade and Industry gives a picture of the motor vehicle industry towards the end of the decade:

"After having achieved record levels during 1981, sales of passenger cars and light commercial vehicles showed decreases in the succeeding years with sales of the year 1986 well below the levels that had already been achieved in 1969. Sales of passenger cars and light commercial vehicles fell sharply particularly in 1985 resulting in exceptionally difficult conditions for both the motor vehicle manufacturing industry and its associated industries".(20)

Whatever the precise extent of economies of scale in motor vehicle assembly and associated component manufacturing processes, the Board of Trade and Industry was clear during the 1960s and 1970s that South African firms were assembling and manufacturing on too small a scale - before the decline of the 1980s described above.

During the years 1965 to 1977 the B.T.I. made recommendations in reports Nos. 1290 (21) and 1777 (22) to achieve rationalisation of the industry. The recommendations were as follows:

(i) Efforts should be made to achieve the largest possible production volumes in the vehicle and component industries in order to minimise unit costs per unit.(23)

(ii) Many of the economies of large scale production could be achieved if the industry could be organised on a basis of vertical disintegration. (24). Vertical disintegration means that the component producers and motor vehicle assemblers are not operating as single firms.

(iii) Production should be concentrated on as few basic models as possible, and these models should be kept in production over a relatively long period of time.

However, although the number of assemblers did decline in the 1970s and 1980s, there was a limit to the decline (see Table 4.4). The B.T.I. notes in 1988 that "despite the fact that the motor industry has suffered severe losses in recent years, the remaining vehicle

manufacturers have displayed a marked reluctance to withdraw from the South African market and only limited action (the formation of SAMCOR in particular) has been taken to accomplish rationalisation through merger or sharing of manufacturing facilities".(25)

In consequence as Table 4.4 shows, Toyota South Africa appeared to be the only firm which had reached the output level consistent with economies of scale as outlined in the study cited by Munk. This study called for a volume of production of "60 000 per annum which need not be all of one model".(26)

TABLE 4.4 PHASE V MARKET SHARE OF VEHICLES

MANUFACTURER	PASSENGER CARS	LIGHT COMMERCIAL VEHICLES	TOTAL MARKET	PERCENTAGE SHARE PHASE V
1. TOYOTA	45 299	22 501	67 800	28.2
2. VOLKSWAGEN S.A (PTY) LTD.	30 314	5 868	36 182	15.1
3. SAMCOR:Ford MMI	19 279 16 837	8 786 7 067	28 065 23 904	11.7 9.9
4. NISSAN	13 624	16 277	29 851	12.4
5. DELTA MOTOR CORPORATION	13 954	8 118	22 072	9.2
6. MERCEDES BENZ (PTY) LTD.	19 430		19 430	8.1
7. BMW SA(Pty)Ltd	13 089		13 089	5.4
TOTAL	171 826	68 567	240 033	100.00

Source : B.T.I. (27)

4.3.2 UNDERUTILISATION OF CAPACITY

Average costs were presumably higher during the years of the 1980s because production fell below full capacity levels (generating unused capacity). Unused capacity has exacerbated the problem of lack of economies of scale. Table 4.5 indicates that the percentage utilisation of production capacity declined rapidly in the motor vehicle industry as compared to manufacturing as a whole during the first part of the 1980s.

TABLE 4.5 UTILISATION OF CAPACITY

YEAR	TOTAL MANUFACTURING	MOTOR VEHICLE ASSEMBLY,PARTS AND ACCESSORIES
1980	88.5	86.8
1981	89.5	91.1
1982	87.6	87.0
1983	84.9	80.1
1984	86.3	85.5
1985	84.2	74.0
1986	78.5	62.3

Source: B.T.I. (28)

Waverman and Murphy (1992) (29) have calculated from Canadian motor industry data that underutilisation of capacity in 1984 involved a cost penalty of just under 30%. They surmise that the penalty will be somewhat lower for motor industries such as the South African.

4.3.3 MODELS AND MAKES

As noted in section 4.2.1 the B.T.I. had always advocated a reduction in the number of models assembled by local motor firms on economies of scale grounds. In the early 1960s

South Africa vehicle manufacturers were estimated to be producing 24 makes of vehicles with 102 models (30). Subsequently calculations have been done which show that there are less cost reductions to be obtained by reducing the number of models than previously thought (31). They report that a 75% reduction in the number of models reduces cost by 2.46%. These figures are consistent with the view presented in section 4.1.4 that recently "variety" has become less costly in manufacturing.

TABLE 4.6 NUMBER OF MODELS PRODUCED BY MAKE AND MANUFACTURER,1989

MANUFACTURER	VEHICLE MAKE	NUMBER OF MODELS	
1. BMW	BMW	28	
2. DELTA CORPORATION	OPEL	16	
3. MERCEDES BENZ	MERCEDES BENZ HONDA	17	10
4. NISSAN	NISSAN	18	
5. SAMCOR	FORD MAZDA	23	15
6. TOYOTA	TOYOTA	31	
7. VOLKSWAGEN	VOLKSWAGEN AUDI	22	9
8. OTHER		11	
TOTAL NO. OF MODELS		200	

Source : (32)

Table 4.6 above indicates that the number of models has increased by almost 100 percent (from 102 in 1960 to 200 in 1989), while the number of makes of vehicles decreased. The reduction in the number of manufacturers from fourteen in 1967 to seven in 1989, has presumably to do with the failure of demand to grow in the 1980s as well as political pressures on overseas firms. The smaller volume British, French and Italian assemblers withdrew. That the remaining assemblers should have increased models so much reflects (i) strategic behaviour by oligopolists,

(ii) increased technical capacity to handle model variety in assembly and (iii) the fact that cost benefits from longer runs would accrue to component manufacturers rather than to assemblers.(33)

4.3.4 SCALE AND THE SOUTH AFRICAN COMPONENTS INDUSTRY

From the time of the initial studies it seems to have been agreed that minimum efficient scale was generally greater in component manufacture than in assembly. This is still the case. Black and Kaplan see this as serious for South Africa given the " industry fragmentation" documented above. The cost raising impact of the proliferation of makes and models being assembled in South Africa arises mainly out of the impact on component production rather than in the assembly process (34). Like everyone else they are a bit coy on the **size** of excess costs (" we have not sought to determine these cost penalties with any precision ....") (35) but do quote an interview with the managing director of Atlantis foundry to the effect that production costs for truck engine block casting would fall by an estimated 20% if annual production volumes were to rise from 5 000 to 30 000 units (36). They provide "impressionistic evidence" that " there are considerable differences between South African and world scale foreign plants not only in terms of plant size and output but especially in the variety of products produced " and conclude that " scale of production is therefore clearly a problem for the South African industry" (37).

4.4 DISCUSSION OF THE CLAIM THAT VEHICLE AND CONTENT PROTECTION HAVE RESULTED IN EXCESS COSTS IN THE SOUTH AFRICAN MOTOR VEHICLE INDUSTRY

Despite the strong apparent case that can be made for believing that small scale of operation has led to excess costs in motor vehicle assembly (less probably, and less substantial) and component manufacture (more probably, and more substantial), the argument is not cut and dried. Bell takes the view supported by a study for the B.T.I. 1988 report that **"at least in recent years, the excess costs of local sourcing due to content protection (despite the inefficiencies of WCP) have been much smaller than**

has been commonly supposed"(38). The B.T.I. report recognised and stressed that excess costs did exist for most categories of vehicles from a local content of 50 percent by mass upwards. The background to this was that the largest proportion of total tooling investment for average South African vehicles was required to achieve the last ten percent of local content - at the 66 percent local content requirement level. If one focuses on the situation **below 50 percent** however, rather than above it, a rather different picture emerges. According to the B.T.I. figures (39) as summarised by Bell " **locally sourced components comprising 70 percent of the weight of the average small car actually cost less than they would have if imported, by an amount equal to 8,3 percent of the excise value of such vehicles.** This was due to substantial cost savings on the first 50 percent of local content. Excess costs of components in the 50 - 70 percent local content range were equal to 3,6 percent of vehicle excise value".(40) (my emphasis). The figures imply that local components in the first 50 percent of local content were cheaper than imports by an amount equal to about 12 percent of vehicle excise value. (Presumably imports are valued c.i.f. and no doubt heavy components carry high freight loadings).

Suppose we accept the figures as true (for 1988): how are they possible, given the views of recent commentators such as Black and Kaplan about the cost-raising effects of small-scale operation, especially in the component industry?. It is not possible to answer with certainty, but the following points suggest themselves:

First, a point of qualification : the figures quoted are for an "average small car". They are compatible therefore with costs for some small cars well in excess of the average - and high by world standards, which is what the "impressionistic evidence " records. As we shall see in Chapter 6 Bell insists that there is a wide range of efficiency among motor assemblers in South Africa, and this may well be true of component manufacturers. Another qualification of a sort is that intermediate and large cars, and the various classes of commercial vehicles, are not covered by the cost figures quoted. Some of these will be especially small-volume vehicles, and excess costs may be more significant in their manufacture.

Secondly, putting the qualification aside and looking for an explanation of the achievement, we need to insist that economies of scale are **not** the only determinant of long-run average costs. A version of this point is made vividly by Wormack, Jones and Roos when they point out that General Motors managed to have both the world's highest production volumes and the world's highest costs in many of its component supply divisions through much of the 1980s.(41). Innovations in organisation, management and (perhaps) technology may lower the whole long-run cost curve - so that costs at lower output volumes are lower under the new system than costs at higher output volumes under the old system. "Lean production" (as Womack, Jones and Roos call the new Japanese methods for organising all aspects of the motor industry) was such a set of innovations - and left General Motors behind, perched far out, but high up, on their decreasing cost curves! (But does this have anything to do with South Africa? We address this question at least partially in the next paragraph).

Thirdly, there are grounds for believing that substantial advances in "technical or X-efficiency" and "the organisation of production" (42) have been made by some South Africa firms - as licencees or subsidiaries of overseas best-practice firms. Learning over time is certainly possible - as we saw in Munk's study in regard to Brazilian light truck producers in the 1960s. More recently Womack **et al**. write in relation to Japanese organisation....." the best plants in the developing countries show that lean production can be introduced anywhere in the world" (43). The relevance of this for South Africa is that we have experienced "the early emergence, and subsequent rapid growth, of locally owned producers of Japanese products". This is in fact "a virtually unique feature of the South African industry" (44). Bell refers to the South African motor industry as "Japanified" - with Japanese-sourced vehicles having a large share of the market. Technology and organisational expertise have been transferred within the framework of licensing arrangements.

Fourthly, the (increasing) South African ownership of the assembly companies has been an advantage - both in the early 1960s in introducing Japanese products when foreign investment by Japanese firms was frowned upon by their government, and more recently when a combination of macro-economic instability and political pressure caused various foreigned - owned companies to weaken and then dissolve their commitment to

production in this country. Bell cites the withdrawal of General Motors and the purchase of its assets by Delta Motor Corporation as an example: since GM's withdrawal there has been under Delta motor corporation," a remarkable turnaround in the fortune of GM's former South African operation, **due largely to improved efficiency**".(my emphasis) (45).

Fifthly, we have already noted that the South African local content requirements were low enough not to push much beyond the point at which South African producers had (on average) become competitive with overseas suppliers. It seems that South Africa's local content requirements have been" exceptionally low by international standards" (46). No doubt the issue is debatable, but South Africa may have been wiser than Brazil which set a 95 percent local content by weight target to be reached only 3 years after introduction in 1956.

Sixthly, it is possible that the years around 1988 were favourable to South Africa when making international comparisons. As we noted earlier there was a real depreciation of the rand against the DM and the yen between mid-1984 and 1988. Bell noted: " the local components industry is now more competitive than it was a few years ago. Partly because of this, some OEMs are now finding that imported components, currently comprising about 7 percent of the value of their imports, can be produced more cheaply locally" (47).

Perhaps a not unsatisfactory way to end the investigation in this Chapter into the existence and size of excess costs in the South African motor vehicle industry is to repeat the judgement we commenced section 4.3 with : "at least in recent years, the excess costs of local sourcing due to content protection ...have been much smaller than has been commonly supposed" (48). At the same time as closing off the above discussion, it seems worthwhile to note that Bell makes the surprising claim that costs in the South African motor manufacturing industry also reflect the **"excess costs of imported components**".(my emphasis). These excess costs result from the bargaining power of the transnational corporations which have licensing arrangements or joint ventures with South African-owned firms. Bell claims that these costs may be "substantial, and a more significant barrier to international cost competitiveness in vehicle manufacture than the

excess costs of local sourcing emphasised in the standard analysis" (49). Having noted this point here, we leave it for the time being. We return to it in Chapter 6 where it is possible to develop it in the context of a discussion of the switch from mass-based (or physical) content protection to value-based content protection.

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CHAPTER 5

BENEFITS OF LOCAL CONTENT PROTECTION

5.1 INTRODUCTION

After studying the possible costs of motor vehicle protection (in particular, local content protection) in the previous chapter, this chapter turns to investigate the claimed benefits from this policy. In Chapter 1.4 an outline was provided of the distortions (or divergences between social and private costs or benefits), the addressing of which might provide a justification for protection, or at least for government intervention of some sort. In this approach the reduction (or removal) of the distortions would constitute the benefits of the intervention.

Attempting to identify, and perhaps indicate the size of, these benefits in practice is not at all easy. It requires us to decide which of the possible distortion-based, or market-failure-based, justifications are relevant in the South African motor vehicle industry case. Then some reflection is called for on what sort of evidence (direct or indirect) is required to test for the presence or absence of the supposed benefits. And at that stage data problems emerge as we confront the fact that much of our information does not adequately distinguish between the assembly and the components branches of the motor vehicle industry. However, there is no alternative but to proceed.

Section 5.2 below identifies the particular distortions the historical presence of which can be used as a rationale for local content protection in South Africa. **Section 5.3** considers what evidence one needs to test for the benefits. **Section 5.4** considers employment creation as a benefit and as indirect evidence of other benefits. **Section 5.5** considers direct evidence of other benefits related to the labour market - skills creation, learning effects and related phenomena. **Section 5.6** produces evidence relating to technology transfers and upgrading,learning effects and capacity (or capability) creation at the level of the enterprise and the industry. **Section 5.7** turns to the Balance of Payments and one of the originally stated objectives of local content protection viz. to reduce the growing

contribution by the motor vehicle industry to the demand for imports.

5.2 DOMESTIC DISTORTIONS AND THE RATIONALE FOR CONTENT PROTECTION IN SOUTH AFRICA

The point of this section is to identify some sources of market failure which were present in the South African motor vehicle case and which protection (and particularly content protection) might remove or reduce.

5.2.1 ECONOMIES OF SCALE AND DOWNWARD SLOPING LONG-RUN AVERAGE COST CURVES

It was noted in chapter 1 that the presence of decreasing average costs might be a source of market failure. Then in chapter 4 a length discussion was conducted around the availability of economies of scale in motor assembly and in component manufacturing. The general view reported was that there are such economies - particurlarly in component manufacturing. Thus the attainment of such economies might be seen as a benefit of protection if that policy leads to increased levels of local production. However,given the discussion in chapter 4, it does not seem worth claiming this. Given the failure of demand to grow in the 1980s (see appendix 3A), the survival of seven assemblers despite this, and the duplication of component manufacturers it is fairly clear that economies of scale have not been realised substantially in the South African motor vehicle industry. In fact a good deal of chapter 4 was devoted to explaining why, given low manufacturing volumes, " excess costs" were not higher in the industry than they apparently are. I shall not pursue this topic further here.

5.2.2 EXTERNALITIES AND LEARNING EFFFECTS.

In chapter 1 (sections 1.4.1 to 1.4.3) an outline was produced of the externalities and learning effects which are involved in the creation of industrial and technological capability (1). As labour skills and organisational and technical

capabilities are developed,cost curves shift downwards. Technology and skills are diffused as workers move between firms. Technology is upgraded as firms interact in complementary activities. What evidence is there that such beneficial processes have been at work in the South African motor vehicle industry?

5.2.3 OVERCOMING THE EFFECTS OF CAPITAL-AND LABOUR-MARKET IMPERFECTIONS.

As was noted at the end of section 1.4.3 **some** argument about market failure, which rely on the existence of externalities and learning effects, need to be shored up by the sub-argument that capital- and labour-market imperfections are present which prevent Pareto-optimal resource allocation from being attained. Presumably it is legitimate not to pursue these in any detail - since it is the externalities and learning effects which are of major interest. Moreover such capital-market imperfections as risk aversion, lack of relevant information, adverse selection and moral hazard (2) and such labour-market imperfections as the absence of appropriate apprenticeship arrangements are fairly standard and probably have not assumed particular importance in South Africa in the period since World War II.

However there are certain features of the historical South African labour market which constitute rigidities or imperfections - which ought perhaps to be considered here. (a) Cultural conservatism and geographical immobility of labour limited the growth of a fully-committed wage-labour force and the development of a fully-monetised exchange economy. (b) The presence of politically-imposed colour-bars and restrictions on mobility (influx control) reinforced the rigidities referred to in (a). Both had the effects of (in general terms) raising labour costs, reducing technical efficiency and lowering output and employment levels. While it would be silly to get involved in a length discussion about these features of the South African labour market, it may be useful to say a little more.

As regards cultural conservatism and geographical immobility it is arguable that a major potential benefit of the expansion of manufacturing employment

(including the motor vehicle industry) is a linked set of changes in the social and work attitudes of African labour - which grows from the experience of continuous urban employment.

Presumably the main way in which South African labour was incorporated into the modern, wage-earning economy was **via** mining - and mining was organised around oscillatory migrant labour which implied short-duration contracts, maintained connection by workers with a social base rooted in subsistence agriculture,and relatively low-skilled manual work. The shift to full life-time dependence on wage work, proximity to work, reduced absenteeism,higher skills and training,accumulation of money savings for old age - this was more likely to come about as a by-product of manufacturing employment,rather than of mining.

As regards politically-imposed rigidities in the labour market, South Africa was notorious for its segregated labour market. With job reservation (either formal or informal) and with Whites having a virtual trade union monopoly, skilled and semi-skilled labour which was largely supplied by Whites**, was almost certainly more expensive (costly)** than it need have been - by (say) the 1940s. On the other hand, although African labour was regarded as "cheap labour",it is possible that both attachment to a rural social base by workers and the attempts by whites authorities to restrict entry to urban areas,kept African labour less plentiful, less readily available,less productive,and less cheap (in efficiency terms,i.e. labour cost per unit of output) than might have been the case.

In these contexts, a case for protection - which would not have been the case put forward by the political authorities! - might be made **ex post** for (temporary) protection. The temporary nature of the need would relate to the possibility that a 30 - 40 year sustained period of secondary industrialisation would transform the African labour force as regards attitudes and skills, and lead to full-scale urbanisation and the collapse of the occupationally- and geographically-segregated segments in the labour market.

5.3 THE RELATION BETWEEN BENEFITS AND EVIDENCE

The fundamental point that needs to be made here is that whereas the presence or absence of certain benefits can be **directly** observed, the presence or absence of other benefits may be more difficult to observe and one may have to infer their presence (or absence) **indirectly**. Or of course one may resort to some mix of these two methods. If an increase in output and/or employment is the benefit desired (suppose a labour market rigidity which cannot be directly removed is constraining production), then what happens (after policy intervention) to output and employment can be **directly** observed. If an increase in output and employment is desired because it is believed it will generate some positive externality, then observation may be somewhat more difficult. If output and employment **do** increase after the policy intervention one may **infer indirectly** that benefits have been obtained - but to measure or value them may not be possible directly. However in some cases,and given adequate time and resources,direct measures of the external benefits may be attempted. In the section that follows considerable emphasis will be placed on what happened to employment (or employment creation) in the South African motor vehicle industry after the introduction of local content protection. This will be because the growth of output and employment was itself a benefit that protection was designed to achieve - and because a number of other benefits can be seen as **by-products** of output and employment expansion. Where possible, direct observations of these (and other) by-products will be attempted.

5.4 EMPLOYMENT CREATION - AS BENEFIT,AND AS INDIRECT EVIDENCE OF OTHER BENEFITS.

Although the primary benefit from correctly addressing market failure (caused by the presence of positive externalities, learning effects etc) is an increase in **output**, I shall work with employment (as a rough proxy for output) at this stage.

In chapter 3 where an outline history of the motor vehicle industry was provided, figures were given for the change (1972-1990) in industry employment (Appendix 3E) and for the share in this change which was due to the expansion of component manufacturing

after the introduction of local content protection (section 3.4). A loose estimate put the extra jobs created by the components industry for the period 1960 - 1989 in the range 43 000 - 73 000.

Appendix 3E is reproduced here as table 5.1 so as to facilitate closer study. The familiar pattern of advance and retreat stands out - advance to 1982 (96 260 workers) and retreat with fluctuations to 1990 (82 100), with a net gain of roughly 25 000 (24 590) jobs (3). Although there is some uncertainty about the precise figures,it seems probable that (if we define components fairly broadly) employment grew faster in the components sector than in assembly - doubling (in Duncan's view) over the period 1973-1989.

TABLE 5.1 MOTOR VEHICLE EMPLOYMENT

YEAR	WHITES	COLOUREDS	ASIANS	BLACKS	TOTAL
1972	18 960	12 630	1 040	24 880	57 510
1973	19 320	13 690	1 340	26 880	61 230
1974	20 210	14 020	1 550	30 810	66 590
1975	21 310	14 190	1 950	33 390	70 840
1976	21 840	14 460	2 076	36 080	74 450
1977	21 150	13 410	2 230	33 440	70 230
1978	20 140	13 700	2 410	34 450	70 700
1979	20 800	14 260	2 430	35 810	73 300
1980	20 430	14 390	2 600	42 790	81 310
1981	21 060	16 950	2 930	49 310	90 250
1982	22 140	16 740	2 910	54 470	96 260
1983	22 610	15 060	2 540	49 330	89 540
1984	23 480	16 260	2 710	47 650	90 090
1985	23 160	15 280	2 560	43 840	84 840
1986	20 580	13 630	2 790	44 200	81 200
1087	20 200	13 430	2 730	43 750	80 110
1988	20 700	13 600	2 880	42 800	79 980
1989	21 100	13 900	3 000	42 100	80 100
1990	21 600	13 900	3 100	43 500	82 100

Source: As given in Appendix 3E (pp.63-64)

This brings us for the first time to what amounts to one of the main conclusions of this chapter viz. **local content protection can be linked causally with substantial gains in employment which were reduced by the slowing of macroeconomic growth**. There is evidence that, at the level of output and employment expansion, this policy was achieving its objectives up to the early 1980s, but from 1982 onwards the growth environment in South Africa changed - and the fall in personal disposable income per capita and in business investment levels partly offset the local content protection effects and took the industry back to earlier levels of production and employment and stayed there with some fluctuations. Thus in 1990 the overall production level was at about the 1978-9 level and employment was at about its 1980 level.

During the period under inspection there was more change in the field of employment than is reflected in changes in the size of the labour force. Evidence of some of these other changes can probably be found in Tables 5.1, 5.2 and 5.3.

The racial composition of the industry's labour force changed (Table 5.1). From some very low level the share of the labour force made up by Blacks increased from 43% in 1972 to 53% in 1990 (having reached 57% in 1982). New entrants were predominantly Black: over 75% of workers added to the labour force over this period were drawn from this group (4). While a detailed account of what was happening during this period to the organisation of the labour force, to technology, and to racial distribution of skills is not available, it seems to be a plausible inference from the figures that skills and work-attitudes which had been (in a loose sense) limited to Whites were now being transferred to workers drawn from groups which were **on average** less-skilled and less familiarised to the discipline of factory-work.

However, it is clear that the set-back of the 1980s also affected this side-benefit from employment creation. The point was touched on in the previous paragraph but perhaps should be made more fully. In the expansion phase the racial composition of the labour force changed in favour of Blacks (their total share went from 43% in 1972 to 57% in 1982, and Whites declined from 33% to 23%) - but when industry decline and stagnation set in from the employment peak in 1982 the racial shares in employment moved the other way: Blacks declined to 53% in 1990 and Whites inched up to 26%.

It is not entirely clear why this should have been so. The employment figures (Table 5.1) suggest that a good deal of increased Black employment took place rapidly in the 3 to 4 years before the cyclical employment peak in 1982 (after an earlier rise, 1972 - 76). Perhaps as expectations were scaled down and excess capacity developed in the 1980s, these less-experienced workers were laid off first ; a process which perhaps received reinforcement from the employer response to the relatively fast rate of increase of Black real wages after 1980 (See Table 5.2: in the 1980 - 1990 period Black real wages increased by almost 60%, Indian by 18%, Coloured by 10% and Whites by 1%) (5).

TABLE 5.2 REAL LABOUR COST PER WORKER: ASSEMBLY AND COMPONENTS INDUSTRY (INDEX:1990 =100)

YEAR	WHITES	COLOUREDS	ASIANS	BLACKS	TOTAL	BENEFITS	TOTAL
1972	91	62	61	50	80	115	83
1973	95	66	55	56	84	105	85
1974	92	68	59	59	81	126	85
1975	88	67	59	59	79	137	84
1976	87	61	64	54	74	75	74
1977	84	67	66	58	76	67	75
1978	85	79	76	64	78	64	76
1979	84	55	86	57	76	72	76
1980	92	91	85	63	79	63	78
1981	99	105	87	78	88	41	83
1982	101	96	90	80	88	48	84
1983	103	99	95	85	94	53	90
1984	105	96	100	82	95	104	95
1985	102	93	89	75	92	90	91
1986	105	92	76	71	89	89	88
1987	107	91	76	82	93	95	93
1988	107	96	88	91	99	95	99
1989	108	108	94	102	105	114	106
1990	100	100	100	100	100	100	100

SOURCE:IDC (6). The first five columns refer to wages, the sixth to non-wage labour benefits, and the seventh to wage and non-wage benefits jointly.

TABLE 5.3 RACIAL SHARES: SALARIES AND WAGES:CURRENT PRICES

YEAR	WHITES	COLOUREDS	ASIANS	BLACKS	TOTAL	BENEFITS	TOTAL
1972	60%	11%	1%	16%	88%	12%	100%
1973	57%	12%	1%	17%	88%	12%	100%
1974	54%	12%	1%	20%	86%	14%	100%
1975	52%	11%	2%	21%	85%	15%	100%
1976	55%	11%	2%	22%	90%	10%	100%
1977	52%	11%	3%	23%	91%	9%	100%
1978	52%	13%	3%	25%	93%	7%	100%
1979	52%	13%	4%	23%	91%	9%	100%
1980	48%	15%	3%	27%	93%	7%	100%
1981	45%	16%	3%	32%	95%	5%	100%
1982	44%	13%	3%	34%	94%	6%	100%
1983	47%	12%	3%	33%	95%	5%	100%
1984	47%	12%	3%	28%	90%	10%	100%
1985	50%	12%	3%	27%	91%	9%	100%
1986	49%	12%	3%	27%	91%	9%	100%
1987	47%	11%	3%	30%	91%	9%	100%
1988	46%	11%	3%	31%	91%	9%	100%
1989	44%	12%	3%	32%	90%	10%	100%
1990	43%	11%	3%	33%	91%	9%	100%

SOURCE:IDC (7). Columns as in Table 5.2.

Further evidence that is consistent with the view that as the racial composition of the labour force changed, workers from groups other than the white group were being employed in **somewhat more skilled occupations**, is available in Table 5.2. What is of interest are real wages and salaries per worker (by race group) for the period 1972-1980 - which is before Blacks were incorporated into the trade union and collective bargaining system. As the Black share of employment increased in the 1970s, the real wage payments to Blacks, Coloureds and Asians increased substantially faster than did those to Whites (whose real wages are in fact not much changed). The average real wage increments for racial groups were as follows: Blacks:index rose from 50 to 63=26% increase;Indians:index rose from 61 to 85=39% increase; Coloureds:index rose from 62 to 91=47% increase; Whites:index rose from 91 to 92=1% increase. The index of total real labour cost per worker (including benefits) fell from 83 to 78 over this period - suggesting that what was happening was the marginal substitution of less-skilled (and lower paid) for more-skilled (and higher-paid) workers, with on-the-job training and increased real wages for the new workers but reduced labour costs for employers.

In summary, we can say that output and employment in the motor vehicle industry expanded to greater levels than they would have done in the presence of various distortions and labour market rigidities. In other words they were closer to the socially efficient levels than they would have been without protection (or some other intervention). However the positive effects of local content protection were **offset** to some extent in the 1980s by the severe slowing of economic growth and the decline of per capita income.

In addition to the benefit of more socially efficient levels of output and employment we would expect that the expansion of output and employment would generate certain positive by-products such as technical skill accumulation by workers, changes in social and work attitudes,creation of business organisational capacity, acquisition and diffusion of new technology. So far I have provided some evidence on the changing racial composition of the labour force and on the change in relative real wages (especially in the 1970s) and have suggested that a spread of skills was taking place in the industry.

Although not listed as one of the objectives of local content protection, it is interesting **ex post** to notice that from an income distribution point of view the industry experienced a considerable shift of (wage) income shares from Whites to Blacks. As Table 5.3 shows, the White share of total salaries and wages fell from 60% in 1972 to 43% in 1990. Most of the lost share was picked up by Blacks whose share doubled from 16% to 33% over the same period.

5.5 MORE DIRECT EVIDENCE OF INCREASED SKILLS AND REDUCED COSTS.

The IDC has published data on productivity in the motor vehicle industry since 1972 (8). Labour productivity increased over the years from 1972 to 1981, but with fluctuations about the trend.If we simply compare beginning year with end year, the index rose from 1.22 to 1.48 - which is slightly more than a 20% increase over 10 years. This implies that in the expansion phase labour productivity was increasing on trend at an average rate of roughly 2% per annum. Capital productivity also rose - by 38% over the years 1972-1981. Together these yield a multifactor productivity increase of 26% over the period. This evidence suggests increasing efficiency during the expansion. However, as the investment boom in the early 1980s turned out to be based on false expectations and severe excess capacity emerged,both labour and capital productivity (and hence multifactor productivity) declined markedly and in 1990 were all below their 1972 levels.

Unfortunately it is doubtful whether we can infer very much about the upgrading and diffusion of labour skills from these productivity indices (in particular,from the labour productivity index which concerns us more directly in this section). Obviously, output per unit of factor A depends not only on the "skills" of factor A but also on the contributions of factor B and factor C and on a range of other context-determining variables. As Barker (9) says:

"Any measurement of productivity reflects the combined influence of a number of factors, including changes in technology,capital investment, utilisation of production capacity, management skills, the quality of labour,economies of scale and the structure of the economy "

In the 1970-90 period the structure of the industry was changing (components manufacturing was growing relative to assembly), cyclical-type fluctuations were very marked and (as already noted) excess capacity and over-manning resulted. Technology and production methods also were in process of change (as noted in chapter 4). On balance,then,although these productivity figures promise insights into what happened to worker-skills it would be prudent to leave them aside (10).

5.6 MORE DIRECT EVIDENCE OF BENEFITS RELATING TO TECHNOLOGY TRANSFER AND UPGRADING, AND CREATION OF INDUSTRIAL CAPACITY –

5.6.1 We begin with familiar evidence that is not all direct. Costs are determined by multiple factors - but at least if they fall a benefit is experienced. Some sort of learning (in the absence of factor price declines) is probably taking place. It was indicated in Chapter 4 (section 4.4, pp.79-80) that excess costs due to local content were less than commonly supposed. It was claimed there that if one focuses on the situation below 50% of local content by mass the costs are lower than international cost. The B.T.I. figures (as summarised by Bell) indicated that "locally sourced components comprising 70% of the weight of the average small car actually cost less than they would have if imported, by an amount equal to 8.3% of the excise value of such vehicles". This was due to substantial cost savings on the first 50% of local content. Excess costs of components in the 50 - 70% local content range were equal to 3.6% of vehicle excise value. This implied that local content in the first 50% range was cheaper than imports by an amount equal to about 12% of vehicle excise value.

5.6.2 In chapter 4 an attempt was made to show how this outcome (if true) might have been achieved. Much of that discussion (see section 4.3) is relevant here and might have been better introduced here. However, a few points will bear repeating. First,the assemblers operating in South Africa in 1990 were either subsidiaries of German companies or South African companies with licensing arrangements with Japanese firms. These business arrangements implied that both production and organisational methods (technologies) of an advanced type were

available to the South African firms and efforts were invested in mastering them. Bell pointed out that "the percentage share of Japanese sourced vehicles in total South African production grew from zero in 1960 to 20.4% in 1970 and to 55.5% in 1984" (11).

Secondly, the assemblers were not indifferent to the quality of the local components they were required by local content protection to purchase. To some extent they produced components themselves. They (especially the Germans) also encouraged overseas components manufacturers to set up in South Africa, bringing technology and organisation with them. (It is possible however that while this may have been technologically advantageous, there was a cost - in low volumes, and hence loss of internal economies of scale).

5.6.3 It was also noted earlier that South African firms have not yet developed the capacity to compete successfully in world markets. However Black and Kaplan have stressed that some South Africa firms have " learned to cope with the small and fragmented market by developing considerable expertise in low volume, high variety production"(12). They point out that there is scope for South African firms to reach international global competitiveness (in niche markets) given their experience of surviving in a small fragmented industry. What seems clear is that neither assemblers nor component producers are homogeneous - rather there is a considerable range of competence, capacity and quality.

Within this range there are clearly some firms which have been more successful than others and have turned their South African disadvantage (low-volume, high-variety) into advantages. They have developed under local content protection the capacity required to find niches in overseas markets especially in the "after market " where small batches and great variety are required. Two such firms are Gabriel (which produces shock-absorbers) and Silverton Engineering (which produces radiators). Silverton Engineering was earning R80m a year from export of radiators in 1992, while 10-15% of Gabriel turnover came from exporting shock-absorbers (13).

5.7 LOCAL CONTENT PROTECTION AND THE BALANCE OF PAYMENTS

An important objective of the policy of local content protection was to reduce the share of imports in total sales of both motor vehicles and components (see Chapter 2,section 2.2). A quick look at Table 2.1 in the same chapter shows that in 1956 - 58 only 18-19% of the total materials cost of assembled vehicles was produced locally, the remaining 71 - 72% being imported.

At first sight it seems that this aspect of the objectives of local content protection was not achieved. Especially imports of components (the focus of LCP) escalated quite markedly throughout the period of the 1970s and 1980s (see Table 5.4 below). The contribution by components to the current deficit increased more than five-fold between 1971 and 1985 : from R326m to R1737m.

TABLE 5.4 EXPORTS AND IMPORTS OF MOTOR VEHICLES AND COMPONENTS 1971,1975,1978,1981 AND 1985

(R Millions)

UNITS	1971	1975	1978	1981	1985
MOTOR VEHICLES					
EXPORTS	11	21	26	75	142
IMPORTS	97	215	201	230	244
NET BALANCE	-87	-194	-175	-155	-102
COMPONENTS					
EXPORTS	7	22	19	26	78
IMPORTS	333	542	934	1575	1815
NET BALANCE	-326	-520	-912	-1549	-1737

SOURCE:B.T.I (14)

It was the growing value of imports (despite local content protection) which apparently lay behind the suggestion by the B.T.I (1988) that the basis of local content protection should be shifted from mass to value:

"However, due to increased sophistication in design,the use of lighter and more expensive materials and production methods in the source countries, the foreign exchange outflow through the South African automobile industry has increased dramatically in recent years and is expected to continue doing so in the years ahead. The foreign exchange position of the industry has furthermore deteriorated as a result of its weak export performance. In the light of these circumstances the Board is of the opinion that the time has come to

give regard to a value approach to local content" (15). Professor Kantor (16),writing in 1989, agreed that local content protection had less effect on imports than intended - but did not see this as a problem. In his opinion :

"Despite a complex web of local content by weight regulations devised in Pretoria, local content by value remained low on average and, in fact tended to fall as more technically advanced components were imported. The industry has remained sensibly and effectively imports intensive".

Bell (17), writing in 1990, also noticed that since the mid - 1980s local content by value was tending to fall. He listed B.T.I figures for imported components as a proportion of the value of all components used (see Table 5.5). This ratio rose from 51.6% in 1981 to 58.7% in 1986, and so of course local content by value fell - with most of the change coming after 1984.

TABLE 5.5 IMPORTED COMPONENTS AS PROPORTION OF THE VALUE OF ALL COMPONENTS USED AND OF VEHICLE SALES TURNOVER IN THE MOTOR VEHICLE INDUSTRY.

YEAR	PERCENTAGE OF VALUE OF ALL COMPONENTS USED IN ASSEMBLY	PERCENTAGE OF VEHICLE SALES TURNOVER
1981	51.6	33
1982	50.0	33
1983	48.5	33
1984	51.4	36
1895	54.8	40
1986	58.7	44

SOURCE: (18).

In chapter 4, section 4.3, and elsewhere, we noted that Bell attributes some of this change to the real depreciation of the rand against the DM and the yen. This raises the possibility that the rising value (in millions of rands) of imports, especially of components,is the result of price effects rather than the failure of policy to produce real effects. The price effects relevant for the overall period have to do with the general inflationary environment (here and abroad) since the 1970s, the excess of South Africa's inflation over that of our trading partners which (**cet.par**) leads to a depreciation of the rand and rising import prices (in rand terms), and any real depreciation resulting from financial sanctions and capital flight.

An illustration of price effects can be derived from Table 5.4 by focusing on the rising value of imports of components. According to IDC data (see Table 5.6),input prices applying to imports rose from an index-value of 12.0 (1972) to 48.2 (1985). Roughly, then, the value of the deficit on components in 1971 would be R(4x326) million = R1304 million in 1985 prices,and the deficit would have increased by (433x100/1304)% = 33,2% and not by more than 5 fold (19). But is a real increase in net imports of 33,2%

(1971 - 1985) compatible with the success of the policy ? Presumably (in general) as real growth takes place in an economy the real value of imports will rise. Protection aims to slow this growth by switching demand from foreign to local supply -sources by using tariffs or by regulation. If successful the share of imports in industry supply will fall but there is no reason why the real net foreign deficit for the industry should not continue to grow (20).

It is not easy to interpret the information in Table 5.7 on imports and exports in the motor vehicle industry. However it is possible to hazard comment consistent with the previous paragraph viz. that from 1972 to 1983 when there is a rising trend of production the real value of "the trade account" (deficit) rose until 1980-81, but the share of imports in total demand/supply showed some fluctuating tendency to fall. After 1983 there is evidence in the figures that these trends were reversed - but this is not clear-cut.

TABLE 5.6:MOTOR VEHICLE INDUSTRY- INPUT PRICES,1972-1990

YEAR	LOCAL INPUTS	IMPORTED INPUTS	TOTAL INPUTS
1972	8.6	12.0	9.0
1973	9.6	12.6	10.0
1974	11.5	14.3	11.8
1975	13.6	16.6	14.0
1976	15.8	18.5	16.2
1977	17.9	19.5	18.2
1978	19.8	21.5	20.1
1979	22.8	24.4	23.1
1980	26.2	27.2	26.3
1981	29.5	29.8	29.6
1982	34.3	34.7	34.4
1983	38.7	39.6	38.8
1984	41.7	42.7	41.9
1985	47.6	48.2	47.7
1986	57.2	60.3	57.7
1987	65.7	67.8	66.0
1988	75.7	67.8	74.9
1989	90.8	92.5	91.3
1990	100	100	100

SOURCE:IDC (1992) (21).Series are of price - indices (1990=100)

TABLE 5.7:MOTOR VEHICLE INDUSTRY - ASPECTS OF FOREIGN TRANSACTIONS 1972 -1990

YEAR	EXPORTS-IMPORTS	EXPORTS AS % OF PRODUCTION	IMPORTS AS % OF DOMESTIC DEMAND
1972	(5469)	2	34
1973	(5665)	2	33
1974	(5721)	2	30
1975	(5884)	2	29
1976	(6878)	2	34
1977	(7720)	2	41
1978	(7631)	2	37
1979	(7329)	2	36
1980	(8347)	2	34
1981	(8332)	1	29
1982	(7818)	2	30
1983	(6171)	2	26
1984	(6703)	2	31
1985	(6096)	3	36
1986	(5765)	4	37
1987	(5704)	3	32
1988	(6636)	3	32
1989	(6364)	4	32
1990	(5704)	5	34

SOURCE:IDC (1992) (22). 1990 prices where relevant.

Perhaps a more direct and simple-minded approach will help. Remember that in 1956-58 only 18-19% of the total components assembled was produced locally. If Bell's figures (see Table 5.5) are comparable (local components as proportion of all components by value), then by 1981-83 the local percentage was averaging about 50% - but declined thereafter towards 42% (by 1985), possibly because of technological and real devaluation effects. Suppose we calculate the foreign exchange consequences of maintaining the 1956-58 level of imports-dependence (taken as 80%) through to the end of our period (1991, in fact, because of data availability) (23). Suppose also for purposes of comparison that under local content protection the local economy supplies 50% of components - or, put the other way round, imports-dependence is 50% (24). The total 1991 value of materials was R13.1 billion. 50% local content implies imports of R6.55 billion; whereas 20% local content implies imports of R10.48 billion. This is the kind of " foreign exchange saving " (in the region of R4 billion annually) which original policy-makers presumably had in mind.

What this discussion does not do is, first, to consider the Balance of Payments effects of the motor vehicle industry's demand for imported capital equipment and for imported inputs which do not classify as the output of the motor vehicle industry. No data has been found which would make such a discussion possible. Secondly, the discussion in this section does not discuss what alternative, superior strategies may exist for attending to the Balance of Payments "problems" of a developing economy.

9. Barker, F.S. (1992), **The South African Labour Market:Critical Issues for Transition**, Pretoria:Van Schaik, p.61

10. Black (1994) refers to them (and related figures) as "subject to dispute " and says they should be "treated with caution ": Black, Athony (1994), **An Industrial Strategy for the Motor Vehicle Assembly and Component Sector**, Cape Town: UCT Press,p.48.

11. Bell, Trevor (1990), "A case study of the impact of sanctions on South African motor vehicle industry", in Charles M. Becker,Trevor Bell, Haider Ali Khan and Patricia S.Pollard, **The Impact of Sanctions on South Africa**, **part I, The economy**, Washington D.C: Investor responsibility Research Center,March 1990, pp.63-64.

12. Black, Anthony and Dave Kaplan (1993),"Economies of scale, flexibility and industry restructuring: the case of the South African automobile and component sectors",in Karin Kruger (ed),**Industrial Policy and Development**, Sandton: Industrial Development Corporation, p.244.

13. See Black and Kaplan, **op.cit**., pp.270-276 for more detail about these two firms. Also Black, **op.cit**.,p.83 and pp.86 -92.

14. Board of Trade and Industry (B.T.I) (1988), **Report no.2627,interim report: Investigation into the industry manufacturing passenger cars and light commercial vehicles** Pretoria:Government Printer, p.44.

15. **Ibid**.

16. Brian, Kantor (1989), "Driving into trouble", **Financial Mail**, May 12, p.84

17. Bell, R.T. (1990), **op.cit**.

18. **Ibid**..p.59. Bell reproduces the Table from B.T.I (1988), **op.cit**., Table 5.2.6,p.58.

19. In current prices the deficit on components increases from R326m to R1737m.The deficit increases 5.3 fold.or deficit increases by 433%.In 1985 prices the deficit increases from R1304m to R1737: This is an increase of R433m or 33,2% of the original level.

20. Assuming of course that the industry does not develop an export capacity. Modern criticisms of import-substitution policies are inclined to link the policy causally to a failure to develop exports because (1) protection reduces incentives to export and (2) it fails to provide the active support required to develop export capacity.

21. Industrial Development Corporation of South Africa (1992), **op.cit**., p.5

22. **Ibid**., p.1

23. Black, Anthony (1994), **op,cit**., Appendix 3.

24. According to Black the actual 1991 figures for materials import dependence is 49% i.e roughly the 1981 - 83 level. Black's figures cover both new cars and spares and accessories whereas the 1956 - 58 and 1982 -86 figures are probably for the component content of new cars only.

CHAPTER 6
NEW LOCAL CONTENT REQUIREMENTS

6.1 INTRODUCTION

This study has so far looked at the costs and benefits of protection (especially local content protection) as applied to the South African motor industry during the first five phases of the local content programme. The purpose of this new chapter is to assess the impact of switching from physical content protection (PCP) to value content protection (VCP) as South Africa did in 1989. This chapter is therefore intended to explore the benefits (if any) accruing to the automobile industry and the economy as a result of changes in the measure of local content protection from a mass to a value basis. Apart from its policy importance this topic has some particular interest for this study: first, the issue calls for the development of the Mussa analysis of local content protection which was introduced earlier in chapter 1; secondly, Professor Bell's analysis of the issue develops an approach to the pricing of **imported** components in the industry which has been referred to earlier, and which sheds new light on the excess costs question discussed in chapter 4.

The chapter is divided into four parts. **Section 6.2** reflects briefly on the shortcomings of the first five phases of the local content programme which used mass as basis for the measurement of content. **Section 6.3** presents the most recent local content requirements (in 1990), commonly known as Phase VI of the local content programme. **Section 6.4** looks at how content protection works under licensing arrangements between local assemblers and overseas (multinational) motor vehicle manufacturers. **Section 6.5** uses the model of section 6.4 to predict the effects of a switch from PCP to VCP (as in Phase VI) and compares the prediction with the facts, in so far as this is possible with the data currently available.

6.2 SHORTCOMINGS OF MASS-BASED CONTENT PROGRAMMES

The B.T.I. Report on the industry in 1988 confirmed that the level of local content, when measured on a value basis, was very low and had not risen significantly to reduce the value of imported components under the first five phases of the local content programmes (1). Furthermore, the B.T.I. provided evidence for the claim that there is an inverse relationship between the mass and value of components, when it reported that local components which represented 66% by mass, were only 37,24% by value (2). On the basis of this evidence it is fairly clear that South Africa continued to import almost all high technology components (also high value) at the time when the value of the rand was performing poorly against other major currencies of the world. The emphasis here is that high mass components were often relatively low value components, so that it was possible to comply with content requirements in phases I-V without reducing the **value** of imported components as much as might have been expected (and this was important given the pressure on the Balance of Payments)

This is part of the background to the introduction of a new phase of the local content programme in 1989 in which local content is measured in value terms. The other part of the relevant background was the growing conviction that import-substitution policies created a bias against exports, and that export expansion was a promising source of growth of income, productivity and foreign exchange earnings. Hence the new regulations involved "export facilitation".

6.3 NEW DOMESTIC CONTENT REQUIREMENTS

As already noted,in March 1989 South Africa launched a comprehensive local content programme (Phase VI), based on value, which was a continuation of the government effort to develop a programme which would be appropriate to the state of the industry's evolution and which would further promote the diversification of local component manufacturing. Central to Phase VI is promotion of exports. In addition, local content under Phase VI now includes advertising and administration costs, as well as physical components and materials:presumably under PCP on a mass basis these non-materials did not figure.

The definition of Phase VI is best explained by this formula: local content percentage $=\frac{(PQ-(F-X)}{PQ}$

Q stands for the number of vehicles sold, P is the average price of vehicles, F is total usage of foreign currency and X represents the value of exports.

The above formula clearly indicates that Phase VI was a conscious effort by the government to promote exports and thereby increase foreign exchange earnings. Professor Bell noted:

"Increase in local content thus may be achieved in two ways. One is reducing F (expenditure in foreign currency), thus increasing local content in locally assembled vehicles (or what we shall call "real" local content), measured by (PQ-F)/PQ. The second method .... is through increased exports, X. There is in short, provision in the program for "export facilitation" which permits exports to count in lieu of reductions of F and hence in lieu of increases in real local content" (3).

We wish to present Professor Bell's analysis of the effects of the switch from PCP to VCP in Phase VI. His position on the superiority of VCP can best be summarised by beginning with his conclusion:

"An equivalent level of VCP would thus give lower foreign exchange usage per vehicle than the PCP system. A VCP which gives the same protection to the domestic components industry as the prevailing PCP therefore involves a lower cost in terms of foreign exchange usage and is superior to PCP in this respect"(4).

I shall build up the necessary tools of analysis in the next section (6.4) and make the analysis of the switch to VCP in section 6.5. I shall follow Bell in omitting consideration of "export facilitation" in section 6.4, but shall return to it in section 6.5.2. He also ignores the inclusion of advertising and administration costs, which I shall note briefly in the same section.

6.4 CONTENT PROTECTION AND THE PRICING OF IMPORTED COMPONENTS IN THE PRESENCE OF JOINT VENTURES

6.4.1 THEORETICAL ANALYSIS

In developing his arguments Bell first presents an analysis of joint ventures (JVs) in LDCs developed by Svejnar and Smith (5). He then uses it to show that prices may differ from competitive world prices when TNCs (Transnational corporations) supply components to domestic affiliates. Under this arrangement of a joint venture (a joint venture is formed where a domestic company and TNC co-operate in production and sharing of profits) a substantial range of components is supplied by the TNC to the joint venture at prices that are above competitive prices(6). The system of deletion allowances employed in the industry facilitates the charging of these higher prices. (For brief discussion of these allowances see the end of section 6.5.1).

The analysis begins by assuming that output of the JV (Q) is a function of imported components (X), supplied by the TNC,locally produced components denoted by (Y) and supplied by the domestic company, and labour purchased locally (L), which algebraically can be expressed as follows:

$$Q=Q(X,Y,L)$$

Equations have been developed which show how the TNC and its domestic partner derive profits (rents) from the operation of the joint venture. These equations are then further simplified in a manner which shows profit distribution under licensing arrangements as a particular type of JV. The profit equations for the general joint venture case are :

(1) $\pi_T = (P_x - t - C_x)X + \sigma(1 - \tau)(P_Q Q - P_X X - P_y Y - C_L L)$

(2) $\pi_D = (P_y - C_{y)})Y + (1-\sigma) (P_Q Q - P_x X - P_y Y - C_L L)$

The symbols used are as follows : P_x is the unit price of imported components X, P_y is the unit price of domestic components Y , C_L is the cost of labour, P_Q is output price and Q is output. The symbols σ, t and τ refer to the profit share of the TNC, the unit import tax, and the host country tax on TNC profit, respectively.

The two profit equations now need to be explained .There are two sources from which the TNC and its domestic partner derive their profits. The TNC gets the **first** part of its profit by selling imported units of X to the joint venture (JV). The first part of equation (1) $(P_x - t - C_x)X$ or (unit price of imported inputs - import tax - unit cost of production of imported inputs) multiplied by quantity of imports (X) supplied, shows this first part of TNC profit; while the **second** part of the equation $\sigma (1 - \tau) (P_Q Q - P_x X - P_y Y - C_c L)$ indicates the TNC's after-tax share of profits made by the joint venture.

In equation (2) the first part of the equation $(P_y - C_y)Y$, or (unit price of domestic inputs - unit cost of production of domestic inputs) multiplied by quantity of domestic inputs (Y) supplied , represents the **first** source of profit accruing to the domestic partner, i.e. its profit from selling domestic components to the joint venture. It also receives a **second** profit payment - its share $(1 - \sigma)$ of the profit made by the joint venture (assumed untaxed) (7).

Behavioral assumptions are that the TNC and its domestic partner wish to maximise their respective profits, and to do so they aim to maximise the total rents of the JV. Assuming competitive input supply, the actual costs of inputs, C_x, C_y and C_L, determine resource-allocation by the JV - and " the transfer prices" P_x and P_y together with σ, **which are determined by negotiation,** perform a purely "rent-distributional" function.

Bell now **simplifies the model** to relate to South Africa and generate welfare results. (1) Assume a pure licensing arrangement, so $\sigma = 0$. The TNC does not co-own and share the profits of a JV, but licenses its domestic partner - obtaining in return royalties (ignored here)and the profit from selling components to its partner. This is the arrangement with the Japanese TNCs in South Africa. (2) Since $(P_y - C_y)Y$ is likely to be small, assume $P_Y = C_Y$, so that in effect all domestic inputs, Y as well as L are competitively supplied. Thus in effect we have two inputs, X which is imported and Y (now including L) purchased domestically. (3) If the domestic content requirement is complied with, no duty is payable on imported inputs i.e. $t = 0$

Then the second expression of the TNC profit equation falls away, as does the first expression of the domestic partner profit equation (2). We have

TNC rents : $(P_x - C_x)X$

Domestic profits : $(P_Q Q - P_x X - C_y Y)$

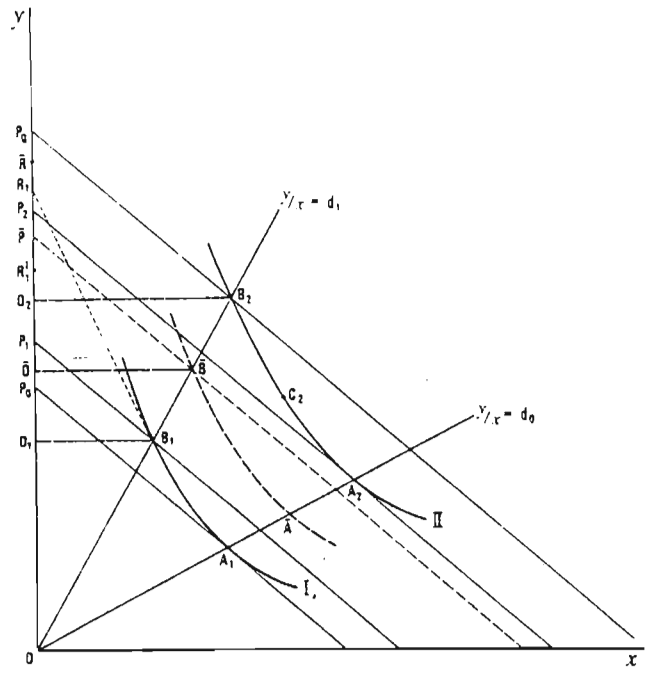
Total joint rents : $(P_Q Q - C_x X - C_y Y)$

Since P_Q, C_x and C_Y are given (8), joint profits are determined. However the variable P_x^* is a determinant of both separate shares. It will be determined by bargaining - and will in general reflect the "relative bargaining strength" of the TNC. The higher is P_x, the higher is the TNC share of total profits under a licensing arrangement of the South Africa type.

6.4.2 GRAPHICAL PRESENTATION

We now turn to a graphical presentation of the domestic content value ratio (or import value ratio) under PCP in the presence of JVs of the licensing arrangement type. The analysis develops the approach due to Mussa which was introduced in Chapter 1.5. In particular it allows for variations in X-efficiency (and profitability) between firms - reflecting what Bell believes to be an important feature of the South African industry.

FIGURE 6.1



Source:R.T Bell(1989) (9)

Firm I is the most efficient firm in the industry and firm II is the least efficient. Their isoquants are shown in figure 6.1, with a dashed isoquant lying between them, which represents the industry (or average firm). Firm I would choose input combination A_1 under free trade but is constrained to B_1 by the physical local content requirement, that is $y/x = d_1$ (where y and x are the quantities of Y and X required to produce a unit of Q). Were there no profits, firm I's output would be priced at OP_1. However price is set at OP_Q. The enterprise makes profits = P_QP_1 which are divided in a manner favourable to the TNC - which receives P_1R_1 as rents on the imported inputs it sells, leaving P_QR_1 for the domestic partner.

This indicates that in the joint venture the bargaining strength of the TNC is great enough to enable it to divide joint profits in this way by pricing the components it sells above their world prices (i.e. it charges D_1R_1 and not D_1P_1). There is no scope for this mechanism in the case of the least efficient firm (firm II), which earns zero rents. Intermediate firms will have some scope, but less than firm I, for excess pricing of imported components. In practice Bell believes excess costs of imported components may

be substantial in the case of the more efficient firms.He quotes a case of a compact passenger car (not identified) for which the **excess costs of imports appeared to be (mid-1986) at least 22 percent of the South African ex-factory price** (my emphasis) (10).

In the model of the industry developed above the least efficient firm has a **higher local content ratio by value** than the most efficient one:OD_2/OP_Q is substantially greater than $(OD_1+R_1P_Q)/OP_Q$. As Bell expresses it, the **import value ratio** of the most efficient firm is substantially greater than that of the least efficient firm:D_1R_1/OP_Q is greater than D_2P_Q/OP_Q. Thus, under PCP for any given physical content requirement, a range of individual firm import value ratios occurs. When the regime is switched to VCP a single import (or, inversely, local) value ratio is required. This will presumably affect the firms in the industry differentially - depending on the level at which the required ratio is set. We proceed to a discussion of this question.

6.5 THE SWITCH FROM PCP TO VCP - AND ITS ADVANTAGES FOR THE SOUTH AFRICAN MOTOR VEHICLE INDUSTRY.

6.5.1 THEORETICAL ANALYSIS

The aim of this section is to reproduce Bell's analysis of the consequences of a switch from PCP to VCP under South African conditions - using the model of the industry developed in section 6.4 . The argument hinges on how firms (in particular the more efficient firms) will respond to the imposition of a single maximum import value ratio (minimum local content value ratio) - which in the case of the more efficient firms is likely to involve a **reduction** in their import value ratios. Bell's analysis is lengthy and intricate - and goes beyond the requirements of this thesis ,but it is not easy to extract a simpler and shorter argument from his discussion. What follows is an attempt to grasp the essentials.

Bell's procedure (11) is (1) to assume the maximum import value ratio is set at three different levels viz. the current firm maximum, the current firm minimum,

and the current industry average. In each case he analyzes what (if anything) happens to the excess pricing of imported components, the physical local content ratio (which is no longer controlled) and the industry's foreign exchange requirements. (2) With these scenarios available he defines an **equivalent VCP** (to a given PCP) as one which gives the same degree of physical (component) protection as the PCP. He derives from his analysis the conclusion that such an equivalent VCP will imply a maximum import value ratio lower than the initial industry average - perhaps subtantially lower. (3) He then compares a given PCP level and an equivalent VCP level and concludes that a "VCP which gives the same protection to the domestic components industry as the prevailing PCP therefore involves a lower cost in terms of foreign exchange usage and is superior to PCP in this respect" (12).

Given this sketch of Bell's argument it appears we can get to the crucial behavioural responses at the heart of it by concentrating on what happens to the industry if the maximum import value ratio is set at the lowest level currently found in the industry i.e. at the level of the least efficient firm (Firm II in Fig.6.1.). How do the more efficient firms respond, in particular the most efficient (Firm I in Fig.6.1.)? Firm I has an import value ratio of D_1R_1/OP_Q. This must now be reduced to a level equal to D_2P_Q/OP_Q. How does it do this?

Bell considers three possibilities - and rejects two. (1) First, the firm might **increase the physical local content ratio** (y/x) above the previously required level of d_1. Bell rejects this on the grounds that unit costs would rise, total profit would fall, and (if TNC rents were unchanged) the full burden of adjustment would fall on the domestic partner's profits, thus weakening its competitiveness and long-term viability. Presumably this would not be in the interest of either partner. (2) Secondly the firm might **increase vehicle price** P_Q - since domestic partner's profits count as local content. As with option (1) this would require the largest response (here price increases) in the case of Firm I. As with option (1) this would reduce competitive advantage and market share. (3) Thirdly,what remains is for the TNC (under the **new bargaining conditions** created by the

requirement of a lower import value ratio) to agree **to reduce the price of the imported components** (P_x) it sells to its domestic partner. These prices and the TNC's rents must be reduced until the value of imports (in the case of Firm I) falls from D_1R_1 to D_1R_1' ($=D_2P_Q$). Since y/x and P_Q are unchanged the total rents of Firm I are unchanged, but the rents of its TNC decline from P_1R_1 to P_1R_1' and the domestic partner's profits increase by the same amount from R_1P_Q to $R_1'P_Q$. Similar adjustments will be required of all firms whose X-efficiency lie between those of Firm I and Firm II - but the size of the adjustment varies directly with the level of X-efficiency.

The theory predicts that an import value ratio set at this low level (or at the somewhat higher level of an "equivalent VCP level") has a number of positive effects compared to the initial PCP. (1) The foreign exchange saving reduces a constraint on the country's economic growth rate. (2) By redistributing rents from TNCs to domestic partners, it increases the ability and incentive of the latter to invest in assembly and component producing capacity and (3) makes them more internationally cost competitive (13).

A final point to be made is about the mechanism by which the imported component prices which have figured in sections 6.4 and 6.5 are set. Imported CKD components come in "packs". As local content programmes take effect , the overseas equivalents of the domestically produced components are removed or "deleted" from the packs. **By under-allowing for the value of these deleted components (i.e. setting "deletion allowances" low) a premium or excess cost is added to the price of the retained components** (my emphasis) (14).

6.5.2 EARLY EVIDENCE ABOUT THE EFFECTS OF THE SWITCH FROM PCP TO VCP IN SOUTH AFRICA.

6.5.2.1 Presumably, the best way to start this section would be to assess Bell's prediction that the switch from PCP to VCP would affect pricing arrangements between the TNC and its domestic partner by lowering the

price of imported componens. Unfortunately there is no information publicly available about this and therefore it is not possible to establish whether Bell's prediction had turned out to be correct or not. Furthermore it seems that such pricing arrangements which are the subject of negotiation between the TNC and the domestic partner, are treated as confidential matters and are not easily researched.

6.5.2.2 There is information available about export perfomance and expansion in the years since 1990. Exports of vehicles (and components) have risen substantially from a low base, although the change in trends pre-dates 1990. According to Black (1994) (15), from "negligible volumes" in the mid-eighties they reached R1,6 billion in 1992. Some 25 per cent of this total was exports of catalytic converters (which because of their platinum content are high value products) but this does not alter the fact that a substantial success has been achieved in the development of exports.

Bell chose , for purpose of analysis, to ignore the fact that Phase VI requirements were intended to facilitate exports. As noted earlier these requirements allowed "exports by an assembler (to) count as local content and enable(d) it to reduce actual local content in domestically produced vehicles "(16). In terms of Bell's analysis (as outlined on p. 124) efficient local assemblers have a further option available to them in responding to the increase in their local content value ratio viz. an increase in exports. The view reported in Black's recent monograph on the industry is that assemblers have taken this route : " It is clear, therefore ", he writes , " that with the growth in exports, OEMs (17) have been able to **drastically reduce the local content in domestically assembled vehicles** "(my emphasis) (18). There is one aspect of export expansion however which does perhaps correspond to the spirit of Bell's analysis. Black (19) records that Toyota (South Africa) has renogotiated the terms of its licence agreement with Toyota Motor Co., " so as to be able to export CBUs to sub-Saharan Africa". Something has had to be conceded by the TNC.

6.5.2.3 As noted earlier (on p.117 and p. 124) local content on a value basis could be defined so as to include advertising and selling costs,administrative costs, and company profits. It appears as if this has in fact happened under Phase VI. Some commentators (20) believe that this has contributed to the reduction of protection for producers of physical components. Local content value targets are now met by price increases resulting from either increased margins or increased advertising and other costs. The former of these Bell specifically rejected in his analysis, and the latter he did not explicity consider. It seems possible that such behaviour is consistent with the structure of the industry - in which oligopolistic firms compete **via** product differentiation (new models are still proliferating) and collude on price setting (21). Bell does not introduce this dimension into his main analysis, though he is not unaware of it.

6.5.2.4 Apparently Bell's predictions about the effects of the switch from PCP to VCP have not materialised, or, if they have, they have been offset by the effects of aspects of the switch which were not included in his analysis.

6.5.2.5 Finally, given problems associated with Phase VI, its requirements have already been modified, and new policy directions are being pursued, asssociated with the work of the Motor Industry Task Group (1992).(22)

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6. Bell, R.T. (1989),**op.cit**., p.108.Bell's statement is strong:"In the presence of joint ventures...the prices actually charged by the TNCs for imported components **may deviate substantially from...competitive prices**" (my emphasis).

7. This provision comes from the specification of Svenjnar and Smith. Bell follows it without comment.

8. P_Q is taken as given by competitive forces at this stage of the discussion.Bell briefly considers alternatives later on.

9. Bell, R.T. (1989), **op.cit**., p.111

10. Bell, R.T. (1989), **ibid**.,p.112, footnote 14. The case is striking enough to be worth quoting."For instance, for one compact passenger vehicle a U.S study gives the total materials cost in mid-1986 at a plant in the country from which CKD(completely knocked down) components are supplied to the South African producer of this model. This cost of materials,for **all components** contained in the model in question, in the supply country, was about equal to the FOBost to the South African producer in mid-1986 of components comprising **less than 30 percent** of the weight of the vehicle. The excess costs of imports implied by this appear to be equal to at least 22 percent of the South African ex-factory price and to completely overshadow the excess costs of local sourcing which, as noted earlier, were, according to the Board of Trade and Industry, 3,6 percent of excise value for compact cars". (Bell's emphases)

11. Bell, R.T (1989), **op.cit**.,pp.112-116.

12. **Ibid**., p.115.

13. Bell, R.T. (1989), notes that for greater cost competitiveness to be turned into greater international price competitiveness "may require a reduction in the tariff on imported assembled vehicles" and a restructuring of the industry. (**op.cit**.,pp.115 - 116)

14. For Bell's discussion of deletion allowances see **ibid**., pp.116-119.

15. Black, Anthony (1994), **An Industrial Strategy for the Motor Vehicle Assembly and Component Sector**, Cape Town:UCT Press, 1994, pp.55-56.

16. **Ibid**., p.53

17. OEMs = Original equipment manufacturers = assemblers.

18. Black (1994), **op.cit**., p.59

19. **Ibid**., p.57.

20. Examples are Black, **op.cit**.. and Ciaran Ryan "Rocketing car prices slated" , **Sunday Times, Business Times**, 7 March 1993.

21. Ryan, Ciaran, **op.cit**.

22. Black, **op.cit**.,p. 53

CHAPTER 7

SUMMARY OF THE MAIN FINDINGS

This chapter is intended to present a summary of the main findings of this study. Given that the thesis is already longer than required the treatment given here - even of important issues - will not be exhaustive.

1. The framework for the study is provided by the theory of market failure, or the theory of optimal government intervention in the presence of distortions (or divergences). Unless it is possible to remove the distortion at source, the policy instrument will in general generate a by-product distortion. Policy assessment then involves a comparison of the gains achieved by addressing the original distortion, and the costs of the by-product distortion.

2. The actual policy assessment attempted in this thesis does not go beyond **identification** of benefits and costs. Full-scale **quantification** presented empirical and conceptual problems which were too large to be tackled here.

3. The costs associated with imposing local content requirements on South African motor assemblers were discussed in chapter 4. The picture is in some regards puzzling.

   3.1 On the one hand it is generally agreed that in component manufacturing there are economies of scale, and South African motor assemblers and independent component manufacturers did not, and do not, produce on a scale anywhere near world minimum efficient scales (1)

   3.2 On the other hand the investigation discussed in the B.T.I. report (1988) and commented on by Bell (1989) implies that excess costs due to content protection have been "much smaller than commonly supposed"(2). In the case of an average small car, **the costs were lower than international costs**, if one focuses on the situation below 50 percent of local content by mass. Professor Bell noted that "locally sourced components comprising 70 percent of the weight of

the average small car actually cost less than they would have if imported, by an amount equal to 8,3 percent of the excise value of such vehicles"(3). This was due to substantial cost savings on the first 50 percent of local content by weight. The figures in fact imply that local components in the first 50 percent of local content were cheaper than imports by an amount equal to **about 12 percent** of vehicle excise value.

3.3 In section 4.4 of chapter 4 the apparent conflict between the two views outlined above is discussed,and it is also partially reviewed in section 5.6 of chapter 5. On the basis of these discussions it is plausible to conclude that some processes of learning had been taking place in the period since 1962. (I shall elaborate on these as part of the discussion of benefits below). It also appears that changes in the real exchange rate must be taken into account; but while the real exchange rate depreciation of the rand in the second half of the 1980s helps to explain the relatively satisfactory cost comparisons reported in section 3.2 above it is not so easy to relate this dimension to the advisability or otherwise of protectionist policies.

3.4 The water is further muddied by the strong contention by Bell that costs in the South African vehicle manufacturing industry reflect the "excess costs of imported components"(4).

4. A discussion of the possible benefits from the policy of local content protection was undertaken in chapter 5. Some of the gains identified are listed below.

4.1 Output and employment in the motor vehicle industry (particularly in component production) expanded to greater levels than they would have done in the presence of various labour market rigidities and distortions- such as racial restrictions on occupational and geographical mobility, immobility and labour supply inelasticity due to cultural dualism, and divergence between wages set by industrial councils and the social opportunity cost of hiring rurally-based labour. Put differently, the motor vehicle industry was closer to socially efficient levels of output and employment than it would have been without protection (or some other

intervention). Of course, this statement rests on the assumption that these were no easy (or relatively low-cost) ways of removing the rigidities and distortions directly. However, returning to the claim that benefits were obtained, it is important to stress that the positive effects of local content protection were offset to some extent in the 1980s by the severe slowing of economic growth and the decline of per capita income.

4.2 Increased output generated learning effects and positive externalities.There is, in other words, a positive correlation between the benefit of more socially efficient levels of output and employment on the one hand, and the generation or accumulation of technical skills, changes in social and work attitudes, the acquisition and diffusion of new technology and industrial capacity on the other hand.

4.2.1 More concretely, in the first place, increases in the relative real wages of Blacks (especially in the 1970s) and the changing racial composition of the labour force suggest that a spread of skill took place in the industry. The White share of total salaries and wages fell from 60 percent in 1972 to 43 percent in 1990. Most of this share was picked up by Blacks whose share doubled from 16 percent to 33 percent over the same period (see Table 5.3).

4.2.2 Secondly, the creation and upgrading of technical and industrial capacity is shown by the positioning of South African branches of international firms within global networks of production (e.g. Gabriel shock-absorbers) and the success of some component manufacturers in independently finding niche markets abroad (Silverton Engineering is the fourth largest distributor of radiators to the U.S.A. "aftermarket") (5).

4.3 A key original objective of the policy of local content protection was to reduce the share of imports in components both assembled and used as spares. The results of this study indicate that the percentage of local material content in the total value of components assembled was about 50 percent in 1981-83, and had

returned to this level by 1991 after declining in the 1980s. This showed remarkable success when compared to the percentage of local content in 1956-58 viz.18-19 percent by value. There is more to be said about local content protection and Balance of Payments than this, but this is as far as research so far undertaken stretches.

5. With the identification and measurement of excess costs as uncertain as they are, and the valuation of benefits as problematic as it is, it is prudent to leave the task of making a quantitative assessment of the policy of local content protection to another day. I trust that what has been done has been enough to show that there is more to be said for local content protection than the elementary analysis of the costs of protection might lead one to conclude.

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