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No. 18

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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

INDUSTRY AND DEVELOPMENT

No. 18

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**UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION**

Vienna, 1986

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Industry and Development attempts to provide a link between practitioners and theorists working on economic and related aspects of industrialization. The focus of the journal is on applied economics, particularly in areas emphasized in the Lima Declaration and Plan of Action on Industrial Development and Co-operation.

The journal is published an average of four times a year as an integral part of the work programme of the Studies and Research Division of the United Nations Industrial Development Organization. It is prepared under the general guidance of a Supervisory Panel, composed of staff members from the Division, with the Head of the Global Studies Branch as its chairman. Responsibility for the detailed supervision of a specific issue is rotated among the members of the Panel. The responsible member for this issue was J. Cody.

The Supervisory Panel of *Industry and Development* welcomes readers' opinions and comments, and will be glad to consider for possible publication articles relevant to the aims and scope of the journal (see "information for contributors", back cover).

ID/SER.M/18

UNIDO PUBLICATION
Sales No.: E.86.II.B.2
ISBN 92-1-106215-2
ISSN 0250-7935
00700P

Explanatory notes

References to dollars (\$) are to United States dollars, unless otherwise stated.

In the tables, three dots (...) indicate that data are not available.

ASEAN Association of South-East Asian Nations

OECD Organisation for Economic Co-operation and Development

EXPORTING TO NORTHERN MARKETS:
THE MAKING OF AN INDUSTRIAL COMPETITIVENESS INDEX

C.-René Dominique and Muhittin Oral*

Introduction

General economic studies of developing countries and the selection of industrial sectors to be developed according to the comparative advantage enjoyed by a particular country are at present mostly based on economy-wide models and similar schemes, including the concept of aggregate consistency, input-output, semi-input-output and linear programming models, the Bruno measure [1] and the effective rate of protection scheme [2]**. For all intents and purposes however, the models provide only planning tools or analytical frameworks rather than an accurate reflection of the economy, because of such inherent weaknesses*** as the assumption of perfect competition, technical problems of aggregation, the need to assess the "control area" of government and the Corden restrictions [11]. More specifically, although helpful to planners in their attempt to assess the overall ability of a country to compete in world markets, they provide little direct guidance to manufacturing firms already facing fierce market competition.

The impressive increase in the exports of developing countries, mostly consumer goods, over the last decade may be attributed to the larger number of manufacturing firms active in foreign markets. A recent study sponsored by the World Bank**** indicates that 16 categories of manufactured goods exported from developing countries to member countries of the Organisation for Economic Co-operation and Development (OECD) increased in nominal value 14.5 times during the period 1970-1980. In other words, over that period, after deflating by the United Nations index of unit value of developed-country exports of manufactured goods, the real growth rates of finished consumer goods (other than apparel), of apparel and of all manufactured goods have averaged, respectively, 20.4 per cent, 15 per cent, and 14 per cent per annum. The study also reveals that Asian countries or territories (primarily Hong

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**A number of non-optimizing models (Johansen [3] and [4], Gillespie and Holland [5], Kresge [6] and a series of partial equilibrium models (UNIDO [7], Little and Mirrlees [8])) are also available.

***Most are discussed in greater detail in Dominique [9] and [10].

****"Key institutions and expansion of manufactured exports", Report RPO 671-68; for a more detailed summary, see Keesing [12].

Kong, the Republic of Korea and Taiwan Province) accounted for the major share of exports, on one hand, while the markets of the Federal Republic of Germany and the United States of America had a strategic importance, on the other. In particular, 46 per cent of the exports went to the United States and 36 per cent to the European Economic Community (of which the Federal Republic of Germany accounted for 14 per cent). Another long-suspected fact as regards the characteristics and nature of the exports was also confirmed by the study, namely, that the goods, ranging from clothes and shoes to transistor radios and digital watches, were mainly labour-intensive.

In all, it seems that despite increasing protectionism, a number of firms in developing countries have been reasonably successful in shaping their output to suit the fast-changing tastes of consumers in OECD countries, while at the same time reducing considerably their X-inefficiency. How this was and is being done, as revealed by interviews and consultant reports, is worth describing in greater detail since it is precisely what we shall attempt to analyse in the next section. The following points are noteworthy:

(a) Finished consumer goods, constituting the major share of manufactured exports, are custom-made for OECD buyers, who provide detailed specifications concerning the design, materials, numbers, sizes, labels, packaging and shipping of the products to be made. Implicit in this arrangement is that developing-country manufacturing firms are expected in time to achieve the same standards as firms in OECD markets;

(b) Buyers are responsible for the marketing and distribution of products in OECD markets;

(c) Importers and retailers in OECD markets seek out low-cost supplies. This leads them to developing-country firms which may lack export experience, but will be provided advice and teaching as necessary. As the exporting firms learn, a stable relationship develops through which importers recover their investment in teaching. Moreover, importers bargain hard and attempt to keep manufacturers' prices as low as possible. They do not hesitate to move to alternative sources in response to small rises in costs, even before recovering their teaching investment;

(d) Buyers are primarily attracted to developing countries with export-oriented policies. Orders are placed by preference in economies with easy duty-free access to imported inputs, since this makes it easier to meet delivery dates or to move to new designs and materials;

(e) Some exporting firms in time acquire the ability to study samples of products and develop new production processes using available resources, while some gain sufficient export experience to operate independently in international markets. Throughout the whole arrangement, however, both buyers and manufacturers take risks.

The above-mentioned developments seem to have created a false sense of optimism in certain quarters. In that connection, two important reminders are called for. First, the simple desire to become active in export markets is by itself clearly no guarantee of success, as a sizeable number of failures has already demonstrated. On the assumption that export demand will progress at the same or even at a faster pace during the next decade, many more firms, without a realistic scheme to assess their prospects, will fail in the attempt, thereby putting a greater strain on already limited resources. Secondly, developing-country firms wishing to improve their performance in export markets would do well to note that their impressive increases in exports during the last decade were not the result of a new open-door policy in OECD countries, but were instead and will remain firmly based on a relative total factor productivity growth and favourable share-weighted rates of decrease in developing-country input costs, which is perfectly consistent with the old and often criticized theory of the firm.*

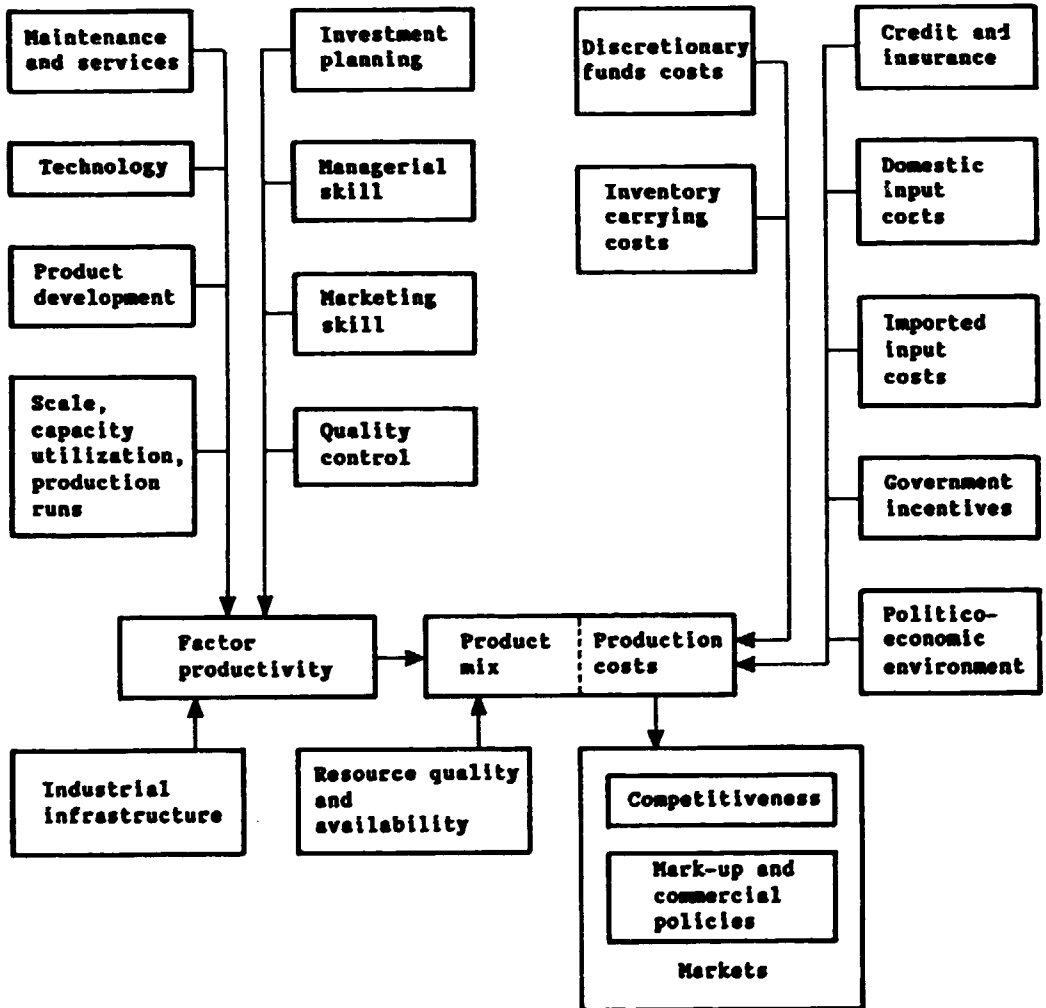
The main purpose of this paper is to elaborate on these two points. In section A we use the concepts of system efficiency and cost effectiveness to develop an operational framework for assessing and reducing X-inefficiency. Section B expands the basic framework so as to show the role of total factor productivity growth in the performance of firms, and examines some of its ramifications for industries and industrial policies. Finally, our main conclusions are summed up in section C.

A. Industrial competition: a framework

In the figure presented below, an attempt is made to depict the findings of the World Bank study referred to in the previous section and other obvious facets of manufacturing, so as to illustrate their effects on either the product mix or the cost of production. Such a layout also lends itself to easy modelling. As can be observed from the figure, tangible factors (maintenance, technology, product development activities etc.) as well as not so tangible ones (managerial and marketing skills) plus the industrial infrastructure (communication network, transport facilities, energy infrastructure etc.) have a direct bearing on factor productivity. Together, factor productivity and resource availability determine the product mix. Items listed in the third and fourth columns of the figure represent internal and external factors affecting production costs. By supposing that production and cost considerations are not symmetrical mainly because of a host of market distortions, contrary to the conventional assumption of perfect symmetry between production and cost functions alluded to in the theory of perfect competition, the competitiveness of developing-country exporting firms is assessed in two distinct stages. In the

*In fact, Oral's mathematical model [13] - applied to selected Turkish firms in food, textiles and stone and clay industries - shows in simple but elegant fashion that this is still the most straightforward way of approaching the study of domestic competitiveness.

Principal factors affecting industrial competition



first stage, the analysis focuses on technological considerations of constrained maximization. In the second, the constrained cost minimization objective is examined separately, before attempting to define what is meant by the competitiveness level of a manufacturing firm.*

As indicated at the outset, though easily made operational, the present framework is first and foremost a theoretical illustration, and as such, the following assumptions hold:

(a) A given domestic firm D in industry K produces the same product bunch, defined as a collection of products requiring different proper subsets R_j of the same set R of inputs or resources, as the most efficient foreign firm F operating in a given target international market M;

* (b) The product bunch of each firm, namely, Q_D^* for firm D and Q_F for firm F, is the product of a column vector of products $[Q_j]$ and a row vector of optimized arbitrary weights (λ_j) . In other words, the scalars Q_D and Q_F contain the same type and number of elements, but they are not necessarily equivalent because of the differences in magnitude of elements Q_j or in λ_j brought about by differences in manufacturing process, production runs and lot sizes;

(c) n-dimensional activity analysis production functions are available, but activities and intensity levels vary between firms D and F;

(d) Elements Q_j are tradable commodities;

(e) The numéraire is a unit of currency in market M.

To repeat, unlike the standard approach, the competitiveness of firm D relative to firm F is examined with respect to technological considerations first, and then with respect to costs. That is to say, firm D, for example, may overcome the technological constraints as best it can, yet remains nevertheless severely constrained on the cost side either because of problems inherent to its milieu or because of the trade policies of its Government. Thus, even at the same level of system efficiency, firm D may fare worse than firm F in market M as a result of cost ineffectiveness, or vice versa.

Suppose for a moment that one was interested in comparing the market performance of different firms, say, firm 1 and firm 2, which are not price takers, operating in the same economic space and producing the same output bunch. One could, according to the

*Considerations pertaining to make-buy choices, intermediate demand within firms, spatial interdependence and non-convexities are ruled out. Also no effort will be made to use social values, although nothing precludes such an inclusion.

standard approach, simply form a mark-up price index P as:

$$P = \frac{(1+\Pi_1)(1+\Theta_1) \sum_j V_{j1}/Q_1^*}{(1+\Pi_2)(1+\Theta_2) \sum_j V_{j2}/Q_2^*} \quad (1)$$

where Π_f = Mark-up on production costs of firm f (f=1, 2)

Θ_f = A uniformly distributed capital recovery factor for firm f, as a percentage of V_{jf}

V_{jf} = Variable cost of product j to firm f (j=1, 2, ..., n)

Q_f^* = Output bunch of firm f, measured in physical units

A value of $P \leq 1$ ($P \geq 1$) would clearly indicate that firm 1 has a better (worse or identical) performance than firm 2 for given identical mark-ups and capital recovery factors. But if Π and Θ are not known, a selling price index can be deceiving as prices may vary from a normal return over costs to whatever markets will bear. A better way of measuring performance is perhaps through a unit cost index formed by simply neglecting mark-ups in (1), that is,

$$C = \frac{(1+\Theta_1)(\sum_j V_{j1}) Q_2^*}{(1+\Theta_2)(\sum_j V_{j2}) Q_1^*} = \frac{(TC_1) Q_2^*}{(TC_2) Q_1^*} \quad (2)$$

where TC_f represents total costs of production to firm f.

Although (2) may be seen as an improvement over (1), it is still not explicit enough, since TC_f is too aggregate a level for detailed analyses of all the pertinent factors, such as scale, technology, input costs, managerial skill etc.

In other words, it encapsulates too much aggregated information to enable firm 2 to identify its problems and opportunities and hence take the necessary measures, though such information may be readily available. One of the very first tasks, therefore, is to make the information contained in the unit cost index C as explicit as possible. This is done in two stages as discussed below.

1. Stage 1: output considerations

Let firm 1 in the above example be the most efficient foreign firm F, and firm 2 be the domestic firm D, the performance of which in international market M is to be evaluated. By assumption 2 they produce optimal output bunches Q_F^* and Q_D^* with weights λ_{jF} and λ_{jD} , respectively. Also let:

a_{ij} = Quantity of resource or input i used by firm D to produce one unit of product j ($i = 1, 2, \dots, m$ and $j = 1, 2, \dots, n$)

b_{ij} = Quantity of resource or input i used by firm F to produce one unit of product j

Q_{jf} = Quantity of product j produced by firm f ($f = D, F$)

Q_f = Output bunch produced by firm f

r_{if} = Level of resource or input i available at firm f

Given the above elements, the processes employed, according to assumption 3, are now completely described by the matrices $A=(a_{ij})$ and $B=(b_{ij})$ and by the column vectors $R^D=[r_{iD}]$ and $R^F=[r_{iF}]$. Then the production problem of firm D can be formulated as

$$\text{Maximize } Q_D = \sum_j \lambda_{jD} Q_{jD} \quad (3)$$

subject to

$$\sum_j a_{ij} Q_{jD} \leq r_{iD} \quad , \quad v_i$$

$$Q_{jD} \geq 0 \quad , \quad v_j$$

and that of firm F as

$$\text{Maximize } Q_F = \sum_j \lambda_{jF} Q_{jF} \quad (4)$$

subject to

$$\sum_j b_{ij} Q_{jF} \leq r_{iF} \quad , \quad v_i$$

$$Q_{jF} \geq 0 \quad , \quad v_j$$

The optimization problems in (3) and (4) are linear programming problems. Suppose that the corresponding optimal solutions Q_{jD}^0 and Q_{jF}^0 are obtained by the simplex method. Then the optimal output bunches are found to be

$$Q_D^* = \sum_j \lambda_{jD} Q_{jD}^0 \quad \text{for firm } D,$$

and

$$Q_F^* = \sum_j \lambda_{jF} Q_{jF}^0 \quad \text{for firm } F.$$

Define now the "industrial mastery" γ as

$$\gamma = \frac{Q_D^*}{Q_F^*} = \frac{\sum_j \lambda_{jD} Q_{jD}^0}{\sum_j \lambda_{jF} Q_{jF}^0} \quad (5)$$

As before, a value of $\gamma \leq 1$ ($\gamma \geq 1$) indicates a more (less or equally) efficient production set for firm F , which derives from the

manufacturing process as reflected in the elements of B , R^F and $\lambda_F = (\lambda_{jF})$ compared with the elements of A , R^D and $D = (\lambda_{jD})$. However, a value of $\lambda < 1$ by itself may not be sufficient to conclude that firm D cannot compete, since it might have an advantage with regard to input costs. This is examined below.

2. Stage 2: cost considerations

As indicated in the figure, some but not all of the factors influencing production cost are under the control of firm D. For instance, commercial policies, exchange rate fluctuations, bank lending policies, the business environment, and energy pricing practices can easily upset the symmetry between the production and cost functions assumed by the traditional theory of the firm.

The second stage of the analysis begins with the assumption that the output bunch of interest is produced with the set of inputs R , which may consist of tradables, non-tradables and primary factors. Each product j is produced with a particular subset, say R_j , of the set R , that is $R_j \subseteq R$.

Next define a variable cost ratio, β_j , for each product j . But since the industrial mastery index portrays the output bunch of firm D in the numerator, the cost elements of firm D for each product j must appear in the denominator of β_j . Thus, in a general form,

$$\beta_j = \sum_{i \in R_j} \frac{P_{iF}}{P_{iD} (Q_{jD}^0 a_{ij} / Q_{jF}^0 b_{ij})} \alpha_{iD}, \quad \psi_j \quad (6)$$

where P_{iF} = Unit cost of production input i to firm F , expressed in the currency of the market of interest

α_{iD} = Share of production input i in total variable cost to firm D.

More explicitly,

$$\alpha_{iD} = \frac{P_{iD} Q_{jD}^0 a_{ij}}{\sum_{i \in R_j} P_{iD} Q_{jD}^0 a_{ij}}, \quad \psi_i$$

Substitution of α_{iD} in (6) yields

$$\beta_j = \frac{\sum_{i \in R_j} P_{iF} Q_{jF}^0 b_{ij}}{\sum_{i \in R_j} P_{iD} Q_{jD}^0 a_{ij}}, \quad \psi_j$$

which is the ratio of the total variable cost of product j to firm F to the cost to firm D. This result can be easily extended to the case of the product bunch in question, including overhead, transport

and insurance costs, as follows:

$$\beta = \frac{\sum_{j=1}^n Q_{jF}^0 \sum_{i \in R_j} P_{iF} b_{ij} + G_F + T_F}{\sum_{j=1}^n Q_{jD}^0 \sum_{i \in R_j} P_{iD} a_{ij} + G_D + T_D} \quad (7)$$

where G_f = Total overhead cost incurred by firm f , expressed in the currency of the market of interest

T_f = Total transport and insurance costs to firm f , expressed in the currency of the market of interest

Let us call β the relative cost index of firm D over firm F. A value of $\beta \geq 1$ ($\beta < 1$) indicates that firm D (firm F) is in a better position than firm F (firm D) with respect to total manufacturing costs.

If needed, (7) can be converted into a social cost ratio in accordance with the Little and Mirrlees [8] scheme, but in this case particular attention ought to be paid to primary and non-tradable inputs as well as to exchange rates.*

3. The industrial competitiveness index

The competitiveness level L of firm D against firm F in international market M , according to the present scheme, is defined as the product of industrial mastery in (5) and the relative cost factor in (7), that is,

$$L = \gamma\beta \quad (8)$$

*Since there may be, in each case, local (l) and imported (ω) inputs, we may write

$$b_{ij} Q_{jF}^0 = q_{ijF}^l = q_{ijF}^l + q_{ijF}^\omega$$

$$a_{ij} Q_{jD}^0 = q_{ijD}^l = q_{ijD}^l + q_{ijD}^\omega$$

and substituting in (7), we have

$$\beta = \frac{\sum_j \sum_{i \in R_j} [P_{iF} q_{ijF}^l + \eta (1+t_{iF}) q_{ijF}^\omega P^\omega] + G_F + T_F}{\sum_j \sum_{i \in R_j} \frac{\eta}{(1-t_{jD})e} [P_{iD} q_{ijD}^l + e (1+t_{iD}) q_{ijD}^\omega P^\omega] + \frac{\eta}{e} G_D + \frac{\eta}{e} T_D}$$

where t = Average ad valorem tax on imports of i or exports of j
 P^ω = c.i.f. price
 η = Official exchange rate in market M
 e = Official exchange rate in country in question

In fact, equation (8) parallels equation (2) and, in addition, opens every aspect of the comparison between the two firms to easy inspection. The way the industrial mastery γ and the relative cost index are formulated provides an instrument for explicitly studying the comparative advantages and disadvantages of the firms with respect to manufacturing characteristics and cost considerations. As formulated, a value of $L \leq 1$ would indicate without any ambiguity that, save for a difference in mark-up rates, firm D is not as competitive as firm F in market M. However, as implied in the analysis, the reason why market M is the chosen target is that it is a market with high income, open to international trade and possibly is large, as is the case with the United States and OECD markets. The managers of firm D now possess all the relevant information that would enable them to pinpoint where the weaknesses and disadvantages of the firm lie. Possible corrective measures at the firm or government level could then be taken, bearing in mind the domestic resource cost of earning a unit of foreign exchange* and the long-term benefits to be gained from competing in market M.

The present analysis may be extended to all single-product firms on the domestic and world markets, or to all competitors selling the same product bunch in market M regardless of their nationality. A way of tackling the latter would be to take the convex combination of the competitiveness levels of the firm against each and every competitor in market M. In more specific terms,

$$L_M = \sum_{F=1}^{F_M^*} \epsilon_{MF} L_{MF}$$

where L_{MF} = Competitiveness level of firm D against firm F in market M

ϵ_{MF} = Market share of firm F in market M, as an indicator of the importance of firm F, $\epsilon_{MF} \geq 0$, $\sum_F \epsilon_{MF} = 1$

F_M^* = Number of competitors active in market M

The same procedure may be repeated for other foreign markets so as to establish the global competitiveness level of firm D in the world market. Suppose there are M^* number of foreign markets in which firm D is interested. Then the global competitiveness of firm D is given by

$$L = \sum_{M=1}^{M^*} \omega_M L_M = \sum_{M=1}^{M^*} \omega_M \sum_{F=1}^{F_M^*} \epsilon_{MF} L_{MF}$$

where ω_M is the "importance" factor of market M to firm D and $\omega_M \geq 0$, $\sum_M \omega_M = 1$.

*But this being clearly a task of economy-wide planners, one would not expect it to be done at the firm level.

B. Formulation of remedial measures

Let us now return to the initial problem, namely the competitiveness level of firm D against the most efficient or most important firm F in market M. Suppose that the competitiveness level L, given by (8), turns out to be less than 1, which indicates that firm D is less competitive than firm F. Some measures ought to be taken to better the position of firm D. Suppose that an adjustment programme is being designed and implemented to improve the performance of firm D in market M. The success of such a programme must somehow be reflected as an increase in the competitiveness level L over time. This section deals with such dynamic considerations. They will first be examined within the present context, and then extended to the local industry to which firm D belongs.

1. Measuring progress in competitiveness

Equation (8) is nothing but a unit cost ratio. This can be easily seen by defining

$$C_F^* = \sum_{j=1}^n Q_{jF}^0 \sum_{i \in R_j} P_{iF} b_{ij} + G_F + T_F \quad (9)$$

$$C_D^* = \sum_{j=1}^n Q_{jD}^0 \sum_{i \in R_j} P_{iD} a_{ij} + G_D + T_D \quad (10)$$

and substituting them in (8)

$$L = \gamma\beta = \frac{Q_D^*}{Q_F^*} \cdot \frac{C_F^*}{C_D^*} = \frac{C_F^*}{Q_F^*} / \frac{C_D^*}{Q_D^*}$$

The extent to which firm D progresses over a time interval, Δt , will be captured in the direction and in the rate of change of L. Differentiating L and rearranging it yields

$$dL = \frac{Q_D^* C_F^*}{Q_F^* C_D^*} \left[\left(\frac{dC_F^*}{C_F^*} - \frac{dC_D^*}{C_D^*} \right) + \left(\frac{dQ_D^*}{Q_D^*} - \frac{dQ_F^*}{Q_F^*} \right) \right] \quad (11)$$

The rate of change of L is therefore

$$\frac{dL}{L} = \left(\frac{dC_F^*}{C_F^*} - \frac{dC_D^*}{C_D^*} \right) + \left(\frac{dQ_D^*}{Q_D^*} - \frac{dQ_F^*}{Q_F^*} \right) = d \ln(\gamma\beta) \quad (12)$$

The interpretation of (12) is straightforward. The competitive position of firm D has improved over the time interval if the right-hand side of (12) is positive. More specifically, the competitiveness of firm D improves if any of the following conditions holds:

(a) For the same cost reduction in both firms, the increase in Q_D^* is greater than the increase in Q_F^* ;

(b) For the same increase in output in both firms, the decrease in C_D^* is greater than the decrease in C_F^* ;

(c) Any combination of increases in output and reductions in cost is greater for firm D than that for firm F.

These findings are in total agreement with common sense. Having examined the production side separately from the cost side, an improvement in the position of firm D implies improvements in either side or in both. Furthermore, the initial effort of organizing the pertinent data along the lines indicated in the figure will make it possible to devise concrete measures aimed at improvements in manufacturing processes, resource availability, factor productivity and production runs, and at identifying cost reduction areas (or at least reductions in the cost of the factors used relatively more intensively). The firm may have much less to say as regards factors external to its operation, but it is hoped that Governments and even banks eager to earn foreign exchange will be more sensitive to a well-documented plea for improvements in areas directly under their control.

2. Assessment of programme at the sectoral level

The present scheme can easily be adapted to an assessment of progress in any local sector, which in turn may guide government industrial policy. An example of such an adaptation is considered below.

Assume that firm D and firm F are active in the same oligopolistic manufacturing industry, and that the performance of these two firms has to be compared. The costs C_F^* and C_D^* can also be expressed in the following forms:

$$C_F^* = \sum_{i \in R} P_{iF} \sum_{j=1}^n Q_{jF}^0 b_{ij} + G_F + T_F$$

and

$$C_D^* = \sum_{i \in R} P_{iD} \sum_{j=1}^n Q_{jD}^0 a_{ij} + G_D + T_D$$

or, defining $q_{iF} = \sum_j Q_{jF}^0 b_{ij}$ and $q_{iD} = \sum_j Q_{jD}^0 a_{ij}$, then

$$C_F^* = \sum_{i \in R} P_{iF} q_{iF} + G_F + T_F \quad (13)$$

and

$$C_D^* = \sum_{i \in R} P_{iD} q_{iD} + G_D + T_D \quad (14)$$

Differentiating (13), on the assumption that G_F and T_F are constants, yields

$$dC_F^* = \sum_{i \in R} P_{iF} dq_{iF} + \sum_{i \in R} q_{iF} dP_{iF}$$

Multiplying the first and second terms on the right-hand side by (q_{iF}/q_{iF}) and (P_{iF}/P_{iF}) , respectively, and dividing the whole expression by C_F^* yield

$$\frac{dC_F^*}{C_F^*} = \sum_{i \in R} \alpha_{iF} \frac{dq_{iF}}{q_{iF}} + \sum_{i \in R} \alpha_{iF} \frac{dP_{iF}}{P_{iF}}$$

where i_F is the share of input i in the total variable cost of firm F . Similarly, for firm D we have

$$\frac{dC_D^*}{C_D^*} = \sum_{i \in R} \alpha_{iD} \frac{dq_{iD}}{q_{iD}} + \sum_{i \in R} \alpha_{iD} \frac{dP_{iD}}{P_{iD}}$$

Substituting (dC_F^*/C_F^*) and (dC_D^*/C_D^*) in (11) and then dividing it by L yields

$$\begin{aligned} \frac{dL}{L} = & \left[\frac{dQ_D^*}{Q_D^*} - \sum_{i \in R} \alpha_{iD} \frac{dq_{iD}}{q_{iD}} - \sum_{i \in R} \alpha_{iD} \frac{dP_{iD}}{P_{iD}} \right] \\ & - \left[\frac{dQ_F^*}{Q_F^*} - \sum_{i \in R} \alpha_{iF} \frac{dq_{iF}}{q_{iF}} - \sum_{i \in R} \alpha_{iF} \frac{dP_{iF}}{P_{iF}} \right] \end{aligned} \quad (15)$$

Equation (15) can be put in a more recognizable form by using the conventional formula for total factor productivity growth,* which is

$$\frac{d\phi_x}{\phi_x} = \frac{dQ_x}{Q_x} - \sum_i \alpha_{ix} \frac{dq_{ix}}{q_{ix}} \quad (16)$$

where ϕ_x = Total factor productivity in firm x
 Q_x = Total output of firm x
 α_{ix} = Share of input i in total cost of firm x
 q_{ix} = Quantity of input i used by firm x

Applying (16) to (15) yields

$$\frac{dL}{L} = \left(\frac{d\phi_D}{\phi_D} - \frac{d\phi_F}{\phi_F} \right) + \left(\sum_{i \in R} \alpha_{iF} \frac{dP_{iF}}{P_{iF}} - \sum_{i \in R} \alpha_{iD} \frac{dP_{iD}}{P_{iD}} \right) \quad (17)$$

The same conclusion as before, but expressed in slightly different terms, then remains valid. That is, for firm D to achieve an improvement in its competitive position, one of the following basic conditions must hold:

*That is, under weaker assumptions than usual, the rate of growth of output less the share-weighted rate of growth of inputs per unit of output.

(a) For the same share-weighted rate of change in input prices in both firms, the increase in the total factor productivity growth of firm D is greater than that of firm F;

(b) For the same total factor productivity growth, input costs must fall more or increase less in firm D than in firm F;

(c) Any combination of increases in total factor productivity growth and negative change in relative costs is greater for firm D than for firm F.

Recall that firm D and firm F are active in the same industry. Being in the same industry, both firms most likely experience the same relative price changes, that is,

$$\frac{dP_{iD}}{P_{iD}} = \frac{dP_{iF}}{P_{iF}} = \frac{dP_i}{P_i}, \quad \forall i$$

Then (17) can be rearranged to give

$$\frac{dL}{L} = \left(\frac{d\rho_D}{\rho_D} - \frac{d\rho_F}{\rho_F} \right) + \sum_{i \in R} (\alpha_{iF} - \alpha_{iD}) \frac{dP_i}{P_i} \quad (18)$$

Moreover, if one considers the situation, rare but not unlikely within the same industry, where $(dP_i/P_i) = k$ for all i , k being a constant, then (18) simply reads

$$\frac{dL}{L} = \frac{d\rho_D}{\rho_D} - \frac{d\rho_F}{\rho_F}$$

since $\sum_i \alpha_{iF} = \sum_i \alpha_{iD} = 1$. Thus the dynamic unit cost reduction between the two firms is reflected only in the first two terms, that is, the difference

$$\frac{d\rho_D}{\rho_D} - \frac{d\rho_F}{\rho_F}$$

It can now be posited in more general terms, and in accordance with the theory of the firm, that costs per unit of output (or value added) of one firm change relative to the others in two ways: when its share-weighted input usage per unit of output decreases more (or increases less) than the others', or when the relative price of factors it uses falls more significantly. In the present simplified case, however, the main conclusion is that if the total factor productivity growth in firm D exceeds that in firm F over the time interval, then firm D has improved its performance relative to firm F.

The result in (18) is also valid within the context of an ex-post analysis of two different international industries, where the local one is favoured as an infant industry by the Government. In that case one talks about industry D and industry F rather than firm D and firm F. Then the result (18) constitutes, as Krueger and Tuncer [14] have found, the necessary (but not sufficient) condition for the Government to justify a preference for the local

industry.* Government intervention in favour of one industry will prove to have been warranted if it is subsequently observed that the unit cost in the favoured industry has decreased more relative to that of the other. But in a comparison of firms in the same industry, (18) can be interpreted in a much more straightforward way. For it is no longer necessary to ask whether the change in relative factor costs resulted from the growth process or if in fact it is a dynamic element induced by domestic commercial policies. As long as $(dP_{iD}/P_{iD}) = (dP_{iF}/P_{iF}) = k$ for all i , the last two terms in (18) drop out. This might not be so in an international comparison, where (17) holds. But for two domestic industries, the main result (or the necessary condition) is given by the first two terms of (18).

Finally, by dropping assumption C, it is easily seen that (18) is also applicable to non-linear processes, such as activities characterized by increasing returns to scale. But in such cases, and without the sufficient condition, one might not be able to account for the cause or causes of the apparent improvement, since it may be attributed to technological change, to the overcoming of indivisibilities, or to the realization of scale economies.

C. Principal conclusions

Thanks to a change in procedure, manufactured exports from developing countries to OECD markets have shown a marked increase during the last decade. Such exports will probably continue their upward trend during the next ten years or so if developing-country manufacturing firms are able to maintain a competitive edge in these markets. A more realistic and meaningful way of assessing the preparedness of these firms to compete, and of reducing their X-inefficiency in order to compete, has been proposed in this paper. To that effect, an evaluation scheme is developed and presented in the form of an industrial competitiveness index which, in addition to its ability to measure, can be instrumental in identifying the competitive strengths and weaknesses of any given manufacturing firms.

Such an analytical framework offers a number of advantages. First, by distinguishing between internal and external factors, it clearly indicates the way in which the pertinent data should be gathered, processed and used in formulating a competitive strategy. Second, it can rank the position of a given firm relative to its competitors in any given target foreign market or in a number of such markets. Third, it can pinpoint, although in general terms, strong and weak areas of operation, thus producing vital

*A sensible industrial development policy for developing countries could easily be derived from this simple principle by selecting a number of key industries to be protected for a Δt of six to seven years on the condition that they satisfy equation (18) with respect to international standards. This admittedly might not be ideal in theory but how else can these countries break loose from the pattern of trade imposed on them since the 19th century?

information for better management. Fourth, when made dynamic, it can measure the extent and identify the nature of change in the competitive performance of firms. Finally, it can be extended to sectoral ex-post analyses of government interventions to protect infant industries by providing at least the necessary conditions for justifying such interventions.

The above conclusions clearly show that the scheme developed in this paper has rather broad implications for better decision-making at the micro-economic level and for a more effective policy formulation at government level.

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INDUSTRIAL POLICIES AND STRATEGIES IN DEVELOPING COUNTRIES:
AN ANALYSIS OF LOCAL CONTENT REGULATIONS

Secretariat of UNIDO*

A. Local content: the concept, its costs and benefits

Introduction

In recent years developing countries have learned that a number of the industries which they had established in the past, and which were appropriate for the golden age of development of the late 1960s and early and mid-1970s, have turned out to be inappropriate to the conditions of the 1980s. Many countries are therefore searching for new ways of reducing their net dependence on the world economy, or of increasing the benefit to the national economy of this dependence - both "benefits" that in the recent past have often been much less than originally foreseen. In such circumstances there is an intensified search for effective policies and strategies for industrial development. One measure that has been employed by developing countries in the past and which could appear particularly appealing in future would be one which - potentially - improves the balance of payments, through reducing the share of imports in final output, while simultaneously stimulating the development of technology, entrepreneurship and labour skills in the domestic economy and strengthening the role of small- and medium-sized enterprises in the economy: local content legislation.

The nurturing of infant industries, both as a form of import substitution and, later, as a source of potential exports, is an industrialization strategy that has been pursued by the vast majority of the developing countries at some stage of their industrialization. In analyzing these policies, considerable attention has been devoted to tariff structures, while other forms of protection have been relatively neglected. Over the last two decades developing countries have increasingly adopted, generally within the context of an import substitution development strategy, trade-related performance requirements designed to ensure that foreign direct investment serves specific national objectives. These have fallen into the following two categories (although, in fact, they are often applied simultaneously to the same firm): export requirements, which specify percentages of production that must be exported by an investing firm; and - the focus in this paper - local content regulations, which specify that a certain percentage of final output must be obtained from local sources.

The argument of this study is that such local content regulations should be seen as an integral part of an entire industrial policy and strategy designed to transform the industrial structure

*Research assistance was provided by B. Behull, a junior contractor working with UNIDO.

of the country - to change the nature and complexity of the output generated, its technological sophistication, the quality of the entrepreneurship and skilled labour employed in its production, the composition and balance of foreign trade, and the relationship between foreign and domestic (small- and medium-sized) suppliers of particular capital goods.

Thus, it is not simply a question of increasing the output of a specific component or product. Properly conceived, it is as much a qualitative as a quantitative transformation of the national capacity, not just to produce a product, but to master new processes and to enhance the country's capacity in such a way as not only to be able to reproduce a given production process, but to build on the technology, entrepreneurship and related skills to contribute to creating an ever more complex and sophisticated industrial structure. It will be seen throughout this study that both in the implementation of local content policies in developing countries and in the analysis of such policies in the literature, it is the narrower conceptualization of local content in terms of an isolated policy measure that clearly predominates, and that the potential costs and benefits of such measures have been inadequately assessed.

1. The nature of local content policies in developing countries

Local content provisions essentially involve a government policy which requires that a certain amount of input (by value or quantity) in a given industrial output be of domestic origin. As such, they are one of the newer, less easily quantifiable, barriers to trade. Being a disguised means of protecting the intermediate stages of production, it "averts some of the domestic and international opposition that additional tariffs might evoke" ([1], p. 583). Economic penalties, such as levying of a high tariff rate on all intermediate imports, are imposed for failure to comply. Widespread use of local content policies occurs in subsectors of the capital goods industry such as the production of pumps, motors or similar equipment, in vehicle assembly and automotive component production, and in the production of components for consumer durables such as televisions and refrigerators, especially by developing countries attempting to establish their own local industries. But a local content policy can be applied whenever intermediate goods are imported for further processing, when component parts are imported and used in assembly operations, or when the component parts are to be produced domestically and utilized in a foreign-controlled or domestically controlled production enterprise.

Local content regulations were generally born at a time when the country was following a policy of import substitution, as in India and Latin America. But, along with tariffs and non-tariff barriers, they continued to be applied in the same countries when they switched to a strategy of export promotion (or when they switched to what appears as a policy of export orientation, but which in reality is an attempt on the part of a country that generally pursues import substitution to induce import-substituting firms to export part of their output.

On the one hand, local content policies have been developed to foster an extension of import substitution policies from imported consumer goods to the capital goods sector as the development process has progressed (with a consequent expansion in the industrial sector and the demand for capital goods). Simultaneously, the countries that have entered capital goods production have recognized the potential for the export of standard, and even more of complex, capital equipment, and have therefore also recognized local content policies as a potential instrument for fostering increased export production.

Explicit local content rules represent, however, a further stage in the development of host government regulation of production than implicit rules such as import tariffs, because an explicit rule generally prescribes a penalty for its violation and fixes a minimum percentage of value added necessary for products to qualify as domestic production. Moreover, local content policies, while generating the balance of payments savings of policies to force exports to offset imports, also foster linkages with the domestic economy and mitigate against an enclave industry. Such policies also complement the existing system of effective protection in developing countries, which through the system of effective (as opposed to nominal) tariff rates fosters forward, but discourages backward, linkages in the industry. On the other hand, joint ventures and allied forms of ownership controls by host Governments represent a yet stronger form of control over foreign operators who wish to produce in developing countries than local content regulations.

In developing countries, local content regulations are commonly imposed after assembly activities have been set up behind tariff walls and import controls, and are usually, though not necessarily, directed at subsidiaries or affiliates of transnational corporations. The rationale of local content policies is that by stipulating that a given amount of value added be produced within a country, a larger part of the benefits of activities generated by transnational corporations could be captured by the host country. And while the high import propensity of transnational corporations is well known, the domination of much of the capital goods industry, including its technology, by developed countries forces developing countries to co-operate with transnational corporations in the capital goods sector. Foreign corporations, in turn, have generally accepted the inevitability of the rising tide of "nationalism" in developing countries, and have looked upon local content requirements as just another trade-related performance requirement and as a price that has to be paid for operations in those countries. Moreover, local content policies are seen by transnational corporations as less objectionable than, for example, joint venture requirements.

The industries where local content regulations are applied generally fall within the capital goods sector, and are therefore intrinsically highly capital-intensive, are characterized by long lead-times in recouping early outlays, and include the most

technologically sophisticated sectors of the economy. Such considerations have historically often been considered to put large-scale development beyond the capacity of any one individual developing country,* and have led to reliance on transnational corporations as agents to assist in the development of these sectors. Local content legislation has been viewed as a major policy instrument for ensuring the participation of developing countries in this development.

For transnational corporations, while the imposition of local content requirements has generally been considered a "cost of doing business" with developing countries, more enlightened management has also focused on ways to exploit the local government incentives that generally form part of the local content package to the maximum extent possible. In some cases the force of competitive pressure on transnational corporations has strengthened their interest in sourcing more of their components in developing countries, generating a congruence of interests between the corporations and local Governments. But in other cases transnational corporations have used their economic leverage to induce weak monitoring of local content levels and non-adherence to timetables.

Simultaneously, in the industrial market economies there is a growing risk of trade barriers which would restrict or even prohibit these imports from the South, a clear potential challenge to the longer-term dimension of local content policy as a platform for generating potential exports. But, since the major investors are transnational corporations (which are often in a position to influence the discussions on trade barriers in the industrial market economies), the risk is reduced for developing countries. At the same time, to the extent that much of the protectionist pressure is directed against Japan, this actually creates potential opportunities for developing countries, since Japan is interested in using developing countries as final assembly points. The assembled products, such as cars, can then be shipped to third markets and sold as not-wholly-Japanese products, to circumvent quotas placed on totally Japanese products.

Designed with the objective of providing a means for backward integration into parts and component manufacture, local content policies have often been seen as a vehicle for facilitating the policy-induced entry into capital goods production, the "muscle industry" of development. As such, the policies have been extremely important measures, since entry into the capital goods industry is crucial as a key to an independent development policy. At the same time, there is considerable evidence that they have generated large losses in economic efficiency because of factors such as the limited size of the domestic market, aggravated by the proliferation of makes and models (which meant that even if the potential scale economies were present, they were squandered by the inability of any

*One major UNIDO concern has been to foster co-operation among developing countries themselves in cases where these developments were considered to be beyond their individual capabilities.

one producer to attain the requisite minimum efficient scale), and the opportunity cost of heavy protection.

As a form of commercial and industrial policy, local content policies can have strong interactions with government policy in areas such as technology, manpower training, entrepreneurship, and the balance of payments. But, in fact, local content policy has not been seen as an integral element of overall domestic policy-making, but has been employed almost exclusively as an ad hoc, industry-specific policy supplementary to existing tariffs and quotas. Further, local content requirements could be conceived as part of an overall industrial policy, and as a policy instrument for carrying out structural change and adjustment in industry. In practice, however, it has at most been seen as part of an overall policy of trade restriction, again supplementing existing tariffs and quotas, for a given sector. It has often also been coordinated with exchange rate policy, an important point since a highly overvalued exchange rate can have a marked impact on the de facto impact of any given set of regulations.

Local content regulations have also been conditioned in part by "export pessimism" and skepticism about the reliability of the international market prevalent in developing countries, which holds "that export earnings of developing countries [can] grow only slowly, if at all, while economic growth [leads] to rapidly rising demand for import-type goods" [2]. When formulating policy under such assumptions, local content requirements are appealing, since they mitigate against rising levels of import content of production. Especially when combined with policies on export promotion or with export requirements, local content regulations can also be seen as a means of stimulating exports, particularly since they apply to the manufacturing sector, whereas export pessimism generally implicitly identifies developing countries with primary commodity exporting.

More specifically local content policy can be seen to have been implemented for several interrelated reasons. One very prominent consideration was the increased industrial capacity, income and output expected to be generated as a result of the policy. It was hoped, and assumed, that by imposing or encouraging domestic content, linkages - and in particular backward linkages - would develop, thereby fostering a more integrated industrial structure, as well as a more self-sufficient national industrial system. The policy was then seen as a vehicle for moving away from an industrial structure characterized by enclave-type assembly activities. In addition, the development of a suppliers industry with an appropriate mix of large-, medium-, and small-scale firms has sometimes been a policy objective, the argument being that the Japanese industrialization experience, based in part on extensive subcontracting, illustrates the advantages of such extensive linkages.

Further, local content policy would facilitate a transfer of technology in so far as technological upgrading and mastery is necessary for local sourcing. Since most assembler firms in developing countries are either subsidiaries or foreign affiliates of

transnational corporations, or at least licensees of foreign firms, the issue of technology transfer and the desire to maximize technological spin-offs and other benefits (such as managerial competence) can also be seen as critical. Viewed optimistically, local content requirements could be seen as a vehicle to assist a developing country to make a technological leap to a higher technological level (for example, into sophisticated electronic automobile components) and hence to serve as a key element of a country's policy-induced attempt to "move" with technology.

Moreover, in addition to increasing employment opportunities generally, in some cases the possibility of upgrading the skill level of the work force has clearly motivated local content requirements in developing countries. This contrasts with the situation in developed countries, where local content legislation is simply seen as a tool to create and preserve jobs (on the later point see section C).

Indeed, content protection can be viewed as a tax on consumption where the tax is embodied in the excess cost of domestic production rather than being explicit. This can in turn be viewed as an investment in technology and the labour force, where the investment is made in the expectation that the higher technical level of the labour force and the technological spin-off will generate benefits that are not easily purchased [3].

Finally, and apparently most importantly for policy-makers in developing countries, local content regulations may produce a positive impact by reducing the demand for foreign exchange, urgently required either to finance a deficit on the balance of trade or a large foreign debt. Since the mark-up, and hence the value, of many components imported by transnational corporations is generally considered to be particularly high, local content regulations can serve to offset the international price-setting policies of the subsidiaries of the corporations in developing countries. In practice, as the case-studies suggest, not only are the foreign exchange savings derived from moving from the import of vehicles to the import of kits less than was often expected, but local component firms also employ imported inputs in their production (see also UNIDO [4]).

These multiple objectives, however, do not receive equal attention, the priorities varying between both countries and industries. In recent years, against a background of severe balance-of-payments and external debt crises, foreign exchange saving has in many cases become a compelling factor in the formulation and application of local content regulations.* From the longer-term

*Where the balance-of-payments consideration is paramount, a degree of flexibility in trading off exports for less local content is often permitted.

perspective, for developing countries the prime motivating force has been the existence of potential externalities from an investment - including the economies of scale that can arise from an infant industry after a learning period, technological overspill from the development of relatively more sophisticated industrial processes, or training and experience which raise the skill level of the labour force - which could be potentially captured by the national economy under a local content policy.

The reasons why the local private sector has failed to supply the products without the support of local content legislation could include market failure, where the local private market lacked a sufficiently long-term perspective or was denied ready access to the required capital financing. But it is perhaps more often the case that there is a need for access to technology, licenses, or skills which the foreign companies possess and are unwilling fully to release, combined with their preference either for in-house sourcing or out-sourcing from traditional partners. Moreover, a local content policy guarantees a market for the local producer and therefore markedly reduces the risk faced by the investor. At the same time, as will be shown later in the case-studies, a realistic appraisal of local content regulations must view them in a context in which developing country Governments are forced to react to changing circumstances, often of a totally external nature, to cope with short-term problems, thereby making the formulation of a well-conceived and integrated, long-term industrial strategy difficult.

A successful policy of localization can be an effective way to stimulate the growth both of assembly ability and component production as well as of the inputs into these operations. But in designing the relevant policies it must be borne in mind that successful entry into the capital goods industry has at least three critical factors - skilled manpower, technology and entrepreneurship - and that the nature of the local content requirement for specific sub-sectors must depend directly on the presence or absence of these factors.

Moreover, local content policies for a given sector should be conceived as part of the totality of policies designed and applied in the area of "technological unpackaging", where the "technology package" refers to the collection of all the hardware and software activities involved in the establishment and operation of an industrial sector or subsector. The process of indigenous development in this case is then defined as the progressive mastering of each of the elements of the technology package. One of the approaches for overcoming the difficulties inherent in the achievement of this objective - such as the technological complexity of the equipment, investment costs, entrepreneurial demands and skill requirements - is that of technology unpackaging, by which is meant the decomposition of an industrial project into its component activities and the progressive mastery (and indigenization) of each activity.*

*See the discussion of technological unpackaging in UNIDO [5] and the material cited therein.

One of the main aims of technology unpackaging is to avoid turnkey operations which exclude domestic participation, and local content regulations represent one of the policies which can be employed to achieve technology unpackaging, and hence foster development, for example through requiring a local content component in turnkey operations. This is not to suggest that local content policies alone are sufficient to attain the objectives of technology unpackaging; other policies must focus on such areas as civil engineering, construction, assembly, and repair and maintenance - all activities within the capabilities of many developing countries and representing a large portion of their total investment expenditure. Thus, local content policies should be seen as an integral element of a larger strategic concept for industrialization.

As part of the import-substitution package, local content regulations are accompanied by tariffs and import restrictions, the former taking a complementary role. Table 1 shows that in the automotive industry, for instance, import restrictions always exist in cases where local content policies are applied. From the point of view of policy-makers, there are several reasons why local content regulations are imposed, even when there already exist protectionist measures designed to promote local industries. First, there may be uncertainty and difficulty in the estimation of the level of tariff protection required to stimulate local production. This is especially true in industries where numerous parts and components are involved. Local content rules, if strictly observed, ensure that the desired degree of local integration is undertaken. On the other hand, the reliance on quantitative import restrictions requires a detailed knowledge of the imported items that need to be import-substituted, knowledge which policy-makers often do not possess.* The last point has implications for the way local content regulations are formulated, and will be dealt with later. Finally, a local content policy, as a non-tariff barrier to trade, falls outside certain important international rules and negotiations on the level and nature of barriers to trade.

While local content policies frequently take the form of a government decree, in some cases they may be more indirectly applied. For instance, the use of domestic inputs may be one of the criteria used in the screening or evaluation of foreign investment proposals. Argentina, Colombia, Egypt, Mexico, Nigeria, Pakistan and the Philippines are some of the countries whose authorities examine, among other things, the balance-of-payments or foreign-exchange impact of proposed projects ([7], [8]). In many cases, investments in natural-resource-based industries such as hydrocarbons need the approval of government agencies. Where such proposals are screened, the use of local inputs and a projection of the local value added would normally be considered. In some developing countries, the planned level of local content is one of the

*Where imports are restricted on a detailed, item-by-item basis with a view to guaranteeing a market for local suppliers, the practice is equivalent to a local content policy.

Table 1. Summary of automotive trade restrictions maintained by selected countries or areas

Country or area	Local content requirements	Import restrictions	Export requirements	Operations by transnational corporations from	
				Japan	United States
Algeria		yes			
Argentina	yes	yes	yes	yes	yes
Australia	yes	yes		yes	yes
Austria		yes			yes
Belgium		yes			yes
Bolivia	yes	yes			
Brazil	yes	yes	yes	yes	yes
Chile	yes	yes	yes		yes
China (Taiwan Province)	yes	yes			
Colombia	yes	yes	yes		yes
Denmark					
Ecuador		yes			yes
Egypt	yes	yes			
France		yes			
Germany, Federal Republic of					yes
Ghana		yes			yes
Greece	yes	yes		yes	
India	yes	yes			
Indonesia	yes	yes		yes	yes
Israel		yes			yes
Italy		yes			
Japan					yes
Kenya		yes	yes	yes	yes
Kuwait					
Malaysia	yes	yes	...		
Mexico	yes	yes	yes	yes	yes
Morocco	yes	yes			yes
Netherlands					yes
New Zealand		yes		yes	yes
Nigeria	yes	yes			
Norway		yes			
Pakistan	yes	yes	yes		yes
Peru	yes	yes		yes	yes
Philippines	yes	yes	yes	yes	yes
Portugal	yes	yes		yes	yes
Republic of Korea	yes	yes	yes		
Saudi Arabia					
Singapore		yes		yes	yes
South Africa	yes	yes		yes	yes
Spain	yes	yes			
Sweden					

continued

Table 1 (continued)

Country or area	Local content requirements	Import restrictions	Export requirements	Operations by transnational corporations from	
				Japan	United States
Switzerland					
Thailand	yes	yes		yes	yes
Turkey	yes	yes	yes		yes
United Kingdom		yes			yes
United Republic of Tanzania		yes			
United States				yes	
Uruguay	yes	yes	yes		yes
Venezuela	yes	yes	yes	yes	yes
Yugoslavia	yes	yes			

Source: United States [6].

Notes: Unless otherwise stated, "no" should be assumed wherever "yes" is omitted.

The data are for about 1980. The measures cited are for new cars, and trade restrictions on used cars are not reflected.

criteria used in the evaluation of whether an industry qualifies for "pioneer" status. Such status may entail higher degrees of foreign capital participation or a variety of special incentives [9]. Governments may also discriminate in their procurement policy in favour of products which incorporate a relatively large amount of local content.

The incentives for industrial investment and development offered by national Governments come in a large number of different forms, including investment codes or laws specifying the criteria for awarding benefits, policies on tariffs and quotas, credit and interest rate policies, fiscal incentives, labour regulations, wages and prices policy, infrastructure investment and government participation.* These factors interact with local content regulations in both the industrial and commercial area, thereby generating

*It is the feature of most investment incentives that, while they may be aimed in part at increasing the rate of domestic savings and investment, they are in large part intended to attract foreign investment into certain priority areas. Local content regulations, on the other hand, while clearly oriented towards increasing output and income, are often primarily imposed as a vehicle for restricting imports in specific sectors.

a very large space over which incentive policies and local content policies can be complementary, offsetting, or self-defeating. While the nature of this interaction is crucial in determining the effectiveness of the local content policy, it has recently been argued that "in many cases, the incentives offered by a country, when taken together, are inconsistent, contradictory or redundant" ([10], p. 1).

Making reference to interviews with representatives of about thirty transnational corporations carried out by Guisinger, Galenson further argues that performance requirements - including local content laws, employment or export targets and limitations on the transfer of funds - had a fairly strong negative impact on locational decisions, and in the food industry, for example, clearly outweighed the positive effect of incentive measures ([10], p. 40). This is a further example of the interlinking of performance requirements and investment incentives, and argues once again for a reform of existing policies (as recently carried out in Côte d'Ivoire, for example) so as to establish a consistency among the tariff subsidies, quantitative restrictions and investment codes that evolved in developing countries during the 1960s and 1970s.

2. Local content legislation and economic policy-making

As with all policy-making, local content policy cannot be formulated in a vacuum, but must be designed to suit both the industries to which it is applied and the overall programme of national economic development. In that connection, a survey of local content policies (see table 2 below) reveals that they are generally applied in the capital goods sector, in industries of crucial importance to the long-term industrialization process of the country. This means that decisions regarding the design and implementation of local content policies in this sector are more critical than many policies in the non-capital goods sector because of the implications for the long-term efficient allocation of resources. Moreover, the capital goods industry is an international industry, and the need to make the right strategy assessment in an uncertain and changing international environment can, in the words of Jones [11], "raise the stakes by an order of magnitude", in the sense that the consequences of mistaken judgements are far more serious in economic and industrial, as well as social and political, terms.

At the present time, the consensus of observers of those sectors where local content regulations are generally applied is that the future international structure of the industries concerned is unclear, this being a particularly uncertain period for the passenger and commercial vehicle industry, to which, together with the allied components industry, such regulations are most often applied. This in turn poses an even greater challenge and creates even more difficult policy decisions for Governments of developing countries. And given the large element of uncertainty in international relations, it strengthens the need for flexible industrial policies, combined with a capacity for rapid response, in developing countries.

The uncertainty facing policy-makers in their efforts to formulate a local content policy in the vehicle and components industry, for example, is compounded by the lack of agreement as to the strategy of transnational corporations in this sector. The prevalent assumption is that they will continue to seek to position themselves in selected developing countries, and to establish, alone or in joint ventures with developing countries, assembly and components production which are ahead of demand in the local market, and therefore export the rest of their production back to developed countries. This is clearly a strategy which is potentially ripe for local content regulations on the part of the developing countries that see transnational corporations as a vehicle for diffusing technology, entrepreneurship and skills to the local economy. The dominant alternative to this "world car" strategy [11] does not foresee the almost inevitable transfer by transnational corporations of production to (lower-cost) locations in developing countries - the feature of the strategy which made it particularly amenable to the application of local content regulations - but, rather, foresees the transnationals taking advantage of the growing spectrum of technological alternatives with a less vertically integrated production structure.

What is clear in this respect is the necessity for policy-makers in developing countries, on the one hand, to attempt, through local content legislation, to integrate the activities of transnational corporations and the local assembly operations and component producers more closely into the national production mix, rather than simply allowing them to exist as marginal sectors grafted onto the national economy, and, on the other hand, to use local content as part of a tougher bargaining position to ensure that the effect of the activity of transnationals is not of dubious value to the economy and inappropriate [12]. This is part of the more general requirement for effective policy formulation that policy-makers in developing countries should integrate into the international market that part of the economy which is internationally oriented and actually or potentially competitive, while simultaneously attempting to ensure an increase in the quantity, quality and sophistication of the technology, entrepreneurship and labour skills utilized in the national economy generally ([13], [14]).

The policy dilemma facing the Governments of developing countries is that they cannot apply local content regulations if transnational corporations are not there, and for many low-income developing countries the transnationals have shown only limited inclination to invest, despite advantages such as low wage costs and proximity to markets. This is presumably due to the fact that these were outweighed by the low level of skills and absence of infrastructure. But even in the middle- and higher-income developing countries, the presence of transnational corporations depends partly at least on factors which these countries are powerless to control, including not only their choice of global strategy, but also the nature of labour agreements reached in developed countries, and on the development of international trends in protectionism. Acting together, these two forces can lead corporations to adopt strategies redirecting production back to the domestic

labour force working behind the protectionist borders of industrial countries, minimizing the role of the periphery in what in fact becomes primarily a series of northern production and trade flows.

With respect to the above point concerning the overall programme of national economic development, in designing local content programmes it is important that government policy-makers pay careful attention to the assembly and manufacturing activities that already exist in the country in related sectors. Such activities may well be only small-scale undertakings that have perhaps developed out of maintenance and repair shops or have been based on copying imported pumps; motors and other machinery. Since the technology, entrepreneurship and skill requirements at this level exist in many developing countries, and because the scale economies are not yet significant, barriers to entry are slight and such activities have sprung up in many developing countries independent of any supportive government policy measures.

At the same time, as the complexity, scope and scale of such operations expands, the requirements in the area of technological sophistication, entrepreneurship and labour skills, the potential economics of scale, the importance of a secure market and the potential competition from exports all increase. In each case, the demand for policy intervention by the Government - in the form, for example, of local content legislation - increases.

Further, the requirement for active and positive policy initiatives increases when national policy-makers turn their attention to designing policies for specific branches or types of manufactured goods, or to enacting policies focusing on the promotion of technological learning, stimulating the development of entrepreneurship, or increasing and diffusing labour skills. In such cases, considerations of scale economies on the production side and of market size on the demand side underscore the importance - for almost all developing countries - of expanding production beyond that appropriate to the domestic market, which, for most developing countries, implies an increased role for the national policy-makers. Moreover, as the scale of such branches and industries increases, so do their effects on Government policy in other branches and sectors. It is therefore crucial that these enterprises be seen as seed-beds for further augmenting development efforts in developing countries, and not merely as sources of domestic supply for a specific tool, motor or pump.

In each of these areas local content policies are one possible policy alternative. But it is clear that they only have a chance of being an efficient and effective policy measure if they are integrated in a realistic and long-term way with policies for other industries (e.g., suppliers of inputs), industrial policy generally (e.g., technological unpackaging), national policy for other sectors (e.g., technology and entrepreneurship), and macro-economic policy (e.g., balance-of-payments policy).

It is a fundamental fact that some 80 per cent of capital goods production in developing countries is accounted for by six

countries (Brazil, China, India, Mexico, Republic of Korea and Yugoslavia) ([15], p. 146), and for the electronics sector - an increasingly critical sector - the degree of concentration is even higher. But just as there exists an informal sector in many other developing countries which carries out the small-scale manufacture of simple products such as implements, tanks, pumps etc., so are there also in the economy - albeit often outside the scope of existing government policy - the experience of metalworking and the entrepreneurial talent that could serve as the starting-point for repair and maintenance and spare parts production that often represent the first steps on the path to the assembly, and then the manufacturing, of components in the capital goods sector. Local content regulations, then, should be seen as one policy measure relating to assembly and manufacturing in the capital goods industry, rather than as ad hoc measures relating to a specific firm or the production of one individual product.

Further development in this direction, as with the expansion of the capital goods sector in general, makes heavy demands on the entrepreneurial talent and skilled manpower, as well as on the technological infrastructure, of developing countries. This requires a detailed policy which is both broad in scope (to capture linkages outside the production and assembly operations) and of a rather longer duration than in the case where no resource gaps are present, otherwise local content regulations may well only be fulfilled in the most formal (and minimal) sense, using only the simplest technology - what has been labelled a form of the "pseudo-transfer of technology" ([5], chapter IV). In addition, it must be recognized that the development of the capacity for assembly and components production is a cumulative process based on learning-by-doing, which can only succeed if pursued on a continuous basis over a long term. Since the development of these sectors depends on, and also has an impact on, the development of other machine-building and the capital goods industry in general, a successful policy on local content must be based on a comprehensive view of the capital goods sector and of the process of industrial development in general.

It appears, however, to be more the norm for government policy-makers to see local content as a vehicle for the policy-induced entry into assembly or component production for the country concerned, generally through completely-knocked-down assembly, where the requirements for the key factor inputs are rather minimal. In such cases, it is crucial that the localization programme not be allowed to stagnate at this stage, where the spill-over benefits for the economy at large are marginal, but be oriented to progressively raising the level and quality of the technology-, entrepreneurship- and skilled-labour-intensity of the local production.

Having argued the potential benefits of including local content legislation as a component of industrial as well as macro-economic policy, it must be emphasized that the examination of the

experience of such regulations* suggests that the policy is not without its costs. In particular, numerous studies (see Westphal [16] and the discussion in section C below) present estimates of unit costs of production under local content policies in developing countries sometimes exceeding the unit cost under best international technology by well over 100 per cent; one striking example quoted by Lim [17] is that of the Philippines, where local content requirements were raised from 10 per cent in 1973 to 62.5 per cent in 1978, and where prices of locally assembled automobiles also rose by 100 per cent or more between 1973 and 1978. And clearly even with the falling minimum efficient scale of production that has characterized automobile production over the last three decades (see table 4 below), the minimum size of at least 200,000 units - which is only for one model - is well beyond the marketing capabilities of almost all developing countries.

But, as White [18] has argued, a one-make company would have a difficult time surviving in a highly variable and unpredictable market. A company therefore needs at least two models to protect it from a wrong guess on styling or engineering and to insure itself against risk of loss. The realistic minimum efficient scale is therefore twice that normally quoted. But the logic of this argument would suggest that three models, and therefore three times the quoted minimum efficient scale, would be optimal. But there are relatively few developing countries with a local market for even 200,000 units; in 1980 only Argentina, Brazil and Mexico surpassed this level [19], with the Republic of Korea expected to reach it by 1985-1986 [20]. This forcefully argues for a policy of "southern content" on the part of developing countries in vehicle assembly and production at the level of the subregion, the region and the South as a whole.

Minimum efficient scale is therefore an extremely effective barrier to entry into automobile production, as it is in many sophisticated capital goods. Policy-makers in all developing countries except the very few with highly sophisticated industrial sectors have wisely focused on assembly operations and on production of components, both of which have an appreciably lower minimum efficient scale. But since such operations generally employ markedly less sophisticated technology and make considerably less demand on entrepreneurship and skills, policy-makers must be particularly careful to ensure that the policies formulated are designed to attain the desired spin-off for the macro-economy as a whole.

Caution must also be exercised in examining the scale of production of all capital goods in developing countries with respect to the technology employed, since even if a developing country produces at the minimum efficient scale, this will only be relevant for the specific technology available to them. But it can be expected that there will exist technologies in operation in the

*See the case studies presented below and the literature cited therein.

more advanced industrial countries that will have a maximum-efficient-scale curve lower than that of developing countries at all output levels; in other words, the technologically more advanced country can always produce cheaper than the developing country, no matter how efficiently the developing country employs its existing technology.

This does not mean the developing country should not produce the specific component or product in question, a point which is reinforced by the infant-industry argument. Moreover, entry into production under local content protection is one possible policy tool to help developing countries to make the jump into high-technology components, or to a new technology with a lower unit cost curve. But it does mean that the policy-makers must have a constant awareness of the extra costs that are clearly going to be involved in decisions to adopt local content policies, as well as of the presumed benefits which led to the decision to impose local content regulations in the first instance, and regularly weigh the one against the other to determine whether remedial action is needed to bring the implemented policy closer to that originally conceived.

3. An overview of local content policies in developing countries

Table 2 shows the various forms of local content policies in twenty developing countries or areas and the industries in which they are applied. In almost all the countries considered, some form of local content policy has been adopted. In a study of this nature, the very limited resources preclude an accurate assessment as to how extensively the diverse policy forms are applied. Certain countries, including Brazil, India, Mexico, Philippines and, recently, Nigeria, are known to emphasize local content. In general, the more closely a country follows a strategy of import substitution, the more comprehensive are the local content regulations. Nonetheless, in some developing countries such as Argentina and Chile, which are attempting to liberalize their trade policies, local content regulations are still enforced, albeit in a more relaxed manner. Even in the "outward-oriented" Province of Taiwan and the Republic of Korea, this form of protection is not alien, although it is more applied on a narrower, more case-specific basis. Explicitly stated local content rules for 22 developing countries or areas are listed in table 3.

Tables 2 and 3 also reveal the striking feature that the automobile industry is almost invariably a candidate for direct local content regulations (see also table 1). Other sectors where local content rules are observed include the appliance industries (Mexico, Peru, Philippines, Venezuela), electronics (Colombia, Peru, Philippines), television (Peru, Philippines, Venezuela), capital goods in general (Brazil, Mexico), pharmaceuticals (Mexico), tobacco (Venezuela) and some processing industries.* Technically, any

*The lists of industries and countries or areas have been limited by the information available in Vienna and are therefore not exhaustive.

Table 2. Formal and indirect local content policies in selected developing countries or areas

Country or area	Sectors in which formal local content rules are applied	Indirect policies
Argentina	Automobiles, tractors	
Brazil	Automobiles, capital goods (steelmaking, railroads, electric energy etc.)	
Chile	Automobiles	
China (Taiwan Province)		Foreign investors may be obliged to meet local content targets (if they fail to export a specified amount of production). Requirements are formulated on a case-by-case basis, and are normally applied in the automobile industry
Colombia	Automobiles, electronics	Exporters who wish to qualify for tax credit have to satisfy certain local content requirements. Under the "buy Columbian" policy, State organizations give preference to local products (defined as incorporating more than 50 per cent local value added)
Egypt	Automobiles	Foreign exchange shortage has resulted in pressure for local sourcing
Hong Kong, Territory of	No rules	Its trading partners increasingly require some level of local value added as a condition for importing products from the Territory of Hong Kong

continued

Table 2 (continued)

Country or area	Sectors in which formal local content rules are applied	Indirect policies
India	No formal rules	Local content requirements are decided at the time of foreign investment approval. Maximum use of local components, raw materials and equipment is sought
Indonesia	Automobiles, pharmaceuticals	Firms processing local materials are highly favoured
Kenya	Automobiles	Local content requirements may be written into foreign investment agreements and have been emphasized since the trade deficit has grown considerably
Malaysia	No formal requirements	To be eligible for extended incentives, manufacturers of certain products must meet local content requirements. Firms whose products contain over 50 per cent local content are entitled to one extra year of tax holiday, or a 5 per cent additional investment tax credit
Mexico	Automobiles, pharmaceuticals, appliances	A firm whose products have 50 per cent local content is considered Mexican, and as such it can participate in tenders limited to local firms. Procurement of locally manufactured capital equipment gives an entitlement to tax credits in the range of 5-15 per cent, depending on local content. The Government explicitly favours domestic products in its procurement services, and has allocated a fund of 750 billion pesos for the purpose

continued

Table 2 (continued)

Country or area	Sectors in which formal local content rules are applied	Indirect policies
Nigeria		A recent comprehensive programme has been established that aims at "maximization of local value added". Under its new economic policy, the Government will avoid commitments with high foreign exchange content - serious attention would only be given to projects based on locally available resources
Pakistan	No formal rules	Foreign investment approvals often depend on a commitment to increase local content. Non-essential consumer industries may have to rely on local materials alone. The 1982/83 import policy enforced the "deletion" programme and limited the number of parts and components that may be imported for such products as television sets, refrigerators and air conditioners, and for motorcycle assembly plants
Peru	Automobiles, tricycles, appliances, electronic, musical and television equipment	
Philippines	Automobiles, motorcycles, appliances	To qualify for "pioneer" status, firms use local materials whenever possible
Republic of Korea		Local content is negotiated individually with foreign firms. For instance, in a recent joint venture in the automotive industry between General Motors and Daewoo Motor, all components are expected to be supplied locally

continued

Table 2 (continued)

Country or area	Sectors in which formal local content rules are applied	Indirect policies
Singapore	No formal rules	Products with high local value added are heavily promoted under the new economic policy
Thailand	Automobiles, motorcycles	For promotional status, very favourable consideration is given to projects incorporating local content
Venezuela	Automobiles, appliances, tobaccos	

Sources: [8], [21]-[26].

Note: The information given is not exhaustive with respect to either industries or countries.

Table 3. Selected local content rules and specific requirements in developing countries

Country	Sectors	Local content requirements (percentage)	Specific requirements and other information
Argentina	Automobiles	88	
Bolivia	Automobiles	45	Three-year grace period to attain this level
Brazil	Automobiles	85-100	Local content achieved by automobile industry is close to 100 per cent by weight
	Some capital goods (steel, electric energy etc.)	80-90	
Chile	Automobiles (less than 850 cc capacity)	30	
	Light commercial vehicles	15	
China (Taiwan Province)	Automobiles	32-70	Most manufacturers also agree to produce certain types of components
Colombia	Automobiles		Local content requirements currently being revised
	Electronics		Manufacturers are required to use the maximum possible amount of local materials and to export a quantity equivalent to their imports. Opposition in principle to local content requirements on the grounds that they lead to high cost and inefficient production
Egypt	Automobiles	40-60	Announced goal of 100 per cent
India	Automobiles	98	

continued

Table 3 (continued)

Country	Sectors	Local content requirements (percentage)	Specific requirements and other information
Indonesia	Automobiles	25	
Kenya	Automobiles	20	Local content specified by item (but not necessarily enforced)
Malaysia	Automobiles	18	Planned to rise to 36 per cent by 1994
Mexico	Automobiles	50 (current), to rise to 60 by 1987	Local content measured as value of import content divided by total value of a typical unit
	Commercial vehicles (light)	65, to rise to 70 by 1985	A minimum of 40 per cent local content for exports, but local content regulations may be waived on new lines designed for exports
	Medium and heavy vehicles	65, to rise to 80 by 1987	
	Automobile components	80	
	Pharmaceuticals	43, to rise to 65 by 1987	Generic labelling rather than brand names is required, so as to reduce dependence on imported ingredients and to increase domestic raw-materials production
	Domestic appliances		From 10 to 25 per cent of parts may be imported, depending on the output of basic appliances such as refrigerators and washing machines
Morocco	Automobiles	40-50	The 60 per cent requirement is for new investment and must be attained after three years

continued

Table 3 (continued)

Country	Sectors	Local content requirements (percentage)	Specific requirements and other information
Nigeria	Automobiles	15	
Pakistan	Motorcycles	77	
Peru	Automobiles	30, to rise to 47 by 1988	Local content is based on value. Exports of components are considered in calculating local content requirements
	Automobile components	10	
Philippines	Automobiles	60 (planned 1984)	The previous plans are now being revised downwards
	Appliances		Varying levels of local content
Republic of Korea	Automobiles	20-95	Requirement depends on model, with most cars having 60-95 per cent local content
Thailand	Automobiles	45 (1982) 50 (1983)	Government has recently abandoned its schemes for pushing local content beyond the present targets. Indeed, the 50 per cent target has been abandoned
	Motorcycles	55	
Turkey	Automobiles		Varies by vehicle type and with foreign exchange situation

continued

Table 3 (continued)

Country	Sectors	Local content requirements (percentage)	Specific requirements and other information
Venezuela	Automobiles	59	Local content based on weight and value. Local content of about 50 per cent has been achieved, though it is short of the original plan to achieve 62 per cent by 1975. Firms may meet up to 30 per cent of the requirements by exporting locally manufactured automotive parts. This figure will decline to 15 per cent by 1985
	Cigarettes	100	Achieved 98 per cent
	Domestic appliances		Local content rules apply to assembly of refrigerators, air conditioners, televisions and washing machines. Specific components are listed for local manufacture after consultation with assemblers
Yugoslavia	Automobiles		Local content percentages and other performance requirements are negotiated with each assembler

Sources: [8], [21]-[27].

Notes: The data are for the end of 1982.

The information given is not exhaustive with respect to either industries or countries.

industry in which the production process can be decomposed into many separate stages or operations is conducive to the application of such a policy. In this type of manufacturing, a large number of intermediate inputs make up the final product. Thus industries such as chemicals, where continuous processes are involved, are not suitable for a gradualist approach to increasing local content (apart from the raw materials inputs). In automotive manufacturing, on the other hand, thousands of components are required with a wide variety of supply sources.

While the above rationalization for local content regulations is clear, the balance of costs and benefits associated with their application is a fundamental issue that has to be addressed.

4. Costs and benefits of local content: some issues

Import-substitution industrialization has been severely criticized by a number of economists who argue that protection has led to costly, inefficient industries as well as biases and distortions in the economy as a whole. Many examples of ill-conceived import substitution policies in developing countries could be cited where very high rates of effective protection were provided without generating significant or tangible benefits ([28], [29]). In some cases, as is frequently pointed out, negative value added at world prices was all that the protected industry could show for its favourable treatment. Writing on the automobile industry in the 1960s, Baranson [30] emphasized the problems created by high cost, poor quality and unreliability of local suppliers in developing countries where the pace of buying local inputs was forced by the Government.

Indeed, there is evidence to show that the automobile industry in developing countries has been typically high-cost [31]. A study of the automobile industry of Iran (Islamic Republic of) in the early 1970s estimates that the various local content requirements and tariffs on imported components amounted to between 536 per cent and 2,555 per cent effective protection rates for the automobile firms [32]. Such high rates, indicative of (static) inefficiency and welfare loss in terms of resource misallocation, may not be untypical of the automobile industry in developing countries.* High-cost production is not, however, entirely attributable to local content requirements. And, while it is clear that the criticisms of import substitution are well grounded, there are also distinct limitations to the static efficiency analysis. Its tendency to emphasize the short-term costs, and to downplay important externalities, such as the benefits of a wide diffusion of technological learning, limits its value for policy-oriented analysis of regulations such as those relating to local content.

Further, while it is quite correct to point out the failures, such analyses omit the experience of the success stories of

*Estimates including the effects of local content protection for other developing countries are not available.

industries which have "grown up" under protection. The industrialization history of developing countries (not to mention developed countries like Japan) is not lacking in such cases. Even the outward-oriented Province of Taiwan and Republic of Korea, both regarded by orthodox economists as examples to be emulated by other developing countries, have combined selective import-substitution (with relatively high protection rates)* with export promotion; but this fact is often not discussed.

At the same time, the infant industry argument is the oldest and best-known rationale for intervention, and is generally considered to be a possible legitimate exception to the case for free trade. The argument presupposes first that, over time, a small (and therefore uneconomic) industry could develop in such a way that costs would decrease sufficiently to repay initial excess costs. Secondly, at least part of the decrease in costs must consist of externalities, since otherwise private producers should be willing to incur the costs in order to reap the benefits. Finally, the protection should be temporary ([2], p. 522).

In fact, when local content regulations have been applied in the automobile industry in developing countries, no attention has been paid to attaining a savings from large-scale production sufficient to repay initial excess costs with an acceptable rate of return; simply attaining a pattern of production characterized by falling unit costs has become an end in itself. Moreover, vested interests in the maintenance of protection have clearly been created. And whereas it could be argued that part of the decreases in unit cost has entailed externalities, so do manufacturing projects almost by definition in developing countries. Indeed, it can be argued that the manufacturing sector as a whole in developing countries (rather than any one industry) can itself be seen as the infant with externalities proceeding from the sector no matter what is produced.

These externalities have, however, in fact often been less than expected because the countries concerned embarked on the assembly of vehicles, or even the production of components, with little experience in machine-building. Further, a preferred method of entry was through the assembly of vehicles from completely-knocked-down kits, a process that is rather simple technologically and highly labour-intensive. As such, government policy backed a mode of entry that minimized the critical skill requirements, but at the cost of not generating any significant technological spin-off.

Recent empirical research further suggests that the process of learning is not as straightforward as is usually assumed. The "implicitness" in technology, difficulties in imitating and teaching, and uncertainties regarding what modifications will work

*See Nam [33] for evidence on protection in the Republic of Korea.

and what will not, combine to make effective technology transfer and learning a complex and difficult process [34]. Summarizing the evidence, Westphal ([16], p. 12) concludes that "even for an 'efficient' infant industry, and evaluated at prices that properly reflect relative scarcities, the domestic resource cost of production might initially be as much as twice the value of the foreign exchange saved (or earned), with up to a decade being required to bring costs down to competitive levels."*

It has, in addition, long been established [36] that a production subsidy to producers** could provide the same benefits at a lower cost to consumers over the period during which the infant industry becomes efficient. But it has clearly been a consideration of developing countries that the policy measures adopted applied to transnational corporations in such a way as both to generate guaranteed markets and reduced risk for local suppliers and to create more propitious conditions for capturing technological externalities that cannot be appropriated by the transnationals, while not imposing expenditure obligations on the Government (as a production subsidy would).

It is a basic principle of the design and application of industrial and commercial incentive measures that the more direct the instrument, the less likely it is to create costly side effects, and conversely [10]. Local content policies encourage local production by restricting imports, but also tend to raise the price of the protected products, thus reducing the marketability of the product, discouraging consumption and probably creating an unnecessary welfare loss for society. A more direct production subsidy, or a direct subsidy for employment or new technology-intensive investment, would be expected to cause fewer distortions in the economy; but even if financed by a neutral tax, such a production subsidy involves a direct, overt burden on society, whereas local content regulations impose the overt burden on the foreign producer and only imply a potential indirect burden for the local economy.

Emerging from this brief discussion is the point that both import substitution and infant industry arguments have certain theoretical and empirical justifications, but also that there are very clear reasons why they have not always worked. This suggests, as with the examination of industrial development in developing countries in general, that the issue is not one of principle, but of the application of the principle in practice, and of the careful examination of why protection has succeeded in some cases, but failed in others.

*He further notes that the rate of effective protection implied at the start of production is as much as 100 per cent. See also Bell [35].

**Or, equivalently, a tariff and a consumption subsidy in like amount.

While it is correct to argue the local content case in terms of dynamic effects and externalities, local content controls can also be analysed in a partial equilibrium setting analogous to that employed for tariffs, quotas, import licences and the like. It can then easily be demonstrated [1] that local content policy can be regarded as the equivalent of tariff protection for intermediates coupled with a subsidy to producers of final goods. But it appears that for developing country policy-makers the appeal of local content regulations has often been centred on truly dynamic aspects such as the potential for technological overspill, while less importance has been attached to the implications of such controls for increasing costs (leading to higher consumer and producer costs and welfare losses). The data given below and the case-studies presented later will both show clearly that higher unit costs have indeed been the norm, and such a static analysis is presented later as part of the discussion of local content in developed countries.

In appraisal of costs and benefits of the imposition of local content regulations by national policy-makers, the behaviour pattern of the other major actor in the relationship, the transnational corporations, must also be considered. Locational decisions by transnational corporations are traditionally highly influenced by factors such as the degree of political stability, the terms for the transfer of profits and repatriation of capital, the pattern of discrimination against foreign ownership and control and the level of regulation and control.* Further, the extent to which future conditions in the country can be predicted (country risk analysis) and the degree of arbitrariness in local government policy (that is, the degree to which the relevant rules and codes are established in advance) ([37], pp. 111-112), as well as the nature of the assurance regarding compensation in the event of nationalization, may be even more important factors in influencing decisions by foreign corporations to invest in export-oriented industries.

In many developing countries the nature of such factors has been - or still is - such as to increase the risk and uncertainty, and hence to reduce the rate of return, to foreign firms associated with investing in the specific country. In order to encourage such investment, trade and exchange rate, as well as tax and subsidy, policies particularly conducive to foreign firms have therefore often been introduced in developing countries, in combination with local content policies. The net effect of this combination of policies depends on the extent to which the local content policies are designed in harmony with the comparative advantage and national resource allocation, as well as with existing tariff and exchange rate controls and incentives, tax concessions, and employment and technology policy. Local content compliance can often only be extracted from foreign firms at a price, such as tax and tariff exemptions.

*See W. H. Diamond and D. B. Diamond, cited in Galenson ([10], p. 5).

But these measures can be very costly to the treasury, to which must be added the fall in tax revenue, as well as the welfare loss of domestic consumers when reductions in production efficiency lead to high costs of production (and loss of exports). And, to the extent that the non-policy considerations mentioned above, as well as basic economic performance, are often considered more important by transnationals than special incentives - because the latter tend to increase the visibility and vulnerability of the firm, as well as being too volatile or transitory ([36], p. 112) - the question immediately arises as to the wisdom of such a comprehensive "carrot-and-stick" policy.

An evaluation of the costs and benefits of local content should therefore extend beyond the traditional analysis of the development of new industries, often from scratch, to manufacture products previously imported. This perspective has already been reflected in the focus of the analysis thus far more on dynamic considerations related to the industrial policies and strategies of developing countries than on consumer and producer welfare costs as in the analysis of tariffs and quotas. But it should be extended to an evaluation not only of local content policy as part of an attempt by developing country Governments to come to terms with the reality of transnational corporations and their role in the national economy, but also of their role, including that of transnational banks, in international trade in manufactures and international finance. A developing country must deal with the impact of these actors on its economy as part of its process of developing a long-term strategy of industrialization and development, and local content regulations are clearly one possible step in this direction. In this respect, the costs of local content are not just to be compared with its benefits as traditionally seen, but also with the opportunity cost of allowing the transnational corporations to proceed unconstrained and without the involvement of the developing country.

B. Case-studies in local content in developing countries

Introduction

As with an evaluation of import substitution policy, so must one analyze local content policy within the broader context of overall government national industrial strategy. A basic result of the analysis presented here is that a local content decree by itself, without a battery of complementary policy instruments, is bound to fail. Given the ambitious and multiple objectives of local content policy discussed above, an integrated strategy is necessary.

Because of the lack of data and the quantification problems, no attempt will be made fully to evaluate the net costs and benefits associated with local integration strategy in the case-studies presented here. Because of a time constraint, the only sources of information were those available at UNIDO headquarters, and no original research or field study could be carried out. The study therefore has drawn extensively on the work of other United Nations bodies, such as the United Nations Centre on Transnational Corporations and the United Nations Conference on Trade and Development,

as well as on previous studies by UNIDO itself. Moreover, the purpose of the study was not to pass judgement in any way on any one particular policy in any given country. This does not mean, however, that no conclusion may be reached regarding the effectiveness of local content regulations. As will be shown, in many cases government policies leave a great deal to be desired. In so far as the objectives or benefits of local integration strategy have not been realized to any appreciable extent, and the initial costs of the policies have been high, then they may be said to have failed.

Given the prevalence of local content regulations in the automobile industry and the ready availability of information on the industry, the case-studies presented here will be mainly concerned with local integration policy in this sector. Many policy considerations and conclusions, however, are applicable to other sectors where local content rules are enforced, since the economics of local sourcing is not unique to the automobile industry.

Mention was made earlier of the traditional production characteristics of the automobile industry - with thousands of components provided by a wide range of suppliers - that make it suitable for local content regulation. In addition, the automobile industry has been regarded as a strategic pole for industrial growth, in part because of the rapid expansion of demand as incomes increase, and it has been believed that a large and growing automobile industry would yield considerable benefits. In particular, the variety of engineering and other skills required, as well as the extensive linkages involved, have seemed to make local content legislation almost irresistible. Furthermore, the automobile industry is viewed in many cases as a prestige or priority sector, its establishment a symbol of industrial maturity.

The industry is clearly an important one in the industrial system of the countries that have already successfully industrialized, a fact which clearly influenced developing countries. Thus, in Canada, for example, automobiles and parts are the largest export item and account for over half of Canada's exports of finished manufactured goods ([38], p. 473). In addition, the automobile industry is a highly technical industry, and is becoming increasingly so. After the military, they are the biggest customers of high technology in the United States. Further, the automobile industry is one in which Governments have traditionally imposed a full gamut of industrial and commercial policies.*

*Thus, it is claimed that Japan stimulates automobile exports by forgiving a commodity tax on exports, and that by acquiescing in the undervaluation of the yen, Japanese exporters enjoy an even greater advantage in the United States market [39]. Crandall [40], however, cites differences in wage rates, labour productivity, management practices, and inventory costs as the dominant sources of the cost disparity, and is supported in this view by a study by the National Academy of Engineers [41].

The automobile industry is also a global industry in which low-cost, offshore production is a byword. In such an environment, there can be a positive interaction between the global production and marketing strategies of transnational corporations and the national development strategies of developing countries. Thus, chairman Kim Woo-Choong of the Republic of Korea's Daewoo Motor speaks of combining United States technology and low-cost Korean labour "to compete head-on with Japan" ([42], p. 126). To the extent that United States car makers see such offshore processing as part of a global survival scheme, then it is very rational that developing countries should respond with local content regulations. And the need for the potential benefits of such contacts is illustrated by the fact that, to quote the results of a study by one developing country government research organization, the automobile components of the country concerned suffer from "low quality and lack of reliability" [42].

Before turning to examine case-studies of local content in the vehicle and components industry, however, it seem appropriate to take a quick look at the data on economies of scale in the industry, since the scale of production is perhaps the most important determinant of the efficiency of the industry, and hence of the rationality of the local content regulations applied.

1. Economies of scale, costs of production and local content in the automobile industry

Despite the labour cost advantage of developing countries, none of them can be said to have a competitive advantage in automobile production. The reason is not simply that labour productivity is lower than in developed countries, but much more the fact that wages account for a small proportion of costs; capital intensity, scale economies and technical know-how are far more important determinants of efficiency in the automobile industry.

While it is dangerous to apply data on economies of scale from one country to other countries at different periods in time, it is nonetheless very clear that the production of certain parts and particular processes are characterized by enormous scale economies. They have been estimated by the United Nations Centre on Transnational Corporations ([31], p. 73) to be 1 to 2 million units for body pressing, 1 million for casting of engine blocks, 100,000 to 750,000 for other castings, 600,000 for power-train machining, 500,000 for axle machining and assembly and 250,000 for painting, and by Bhaskar [43] at 1 million for stamping, 500,000 for engines and 250,000 for assembly (see also Pratten [44], Rhys [45] and Bloomfield [46]).

At the same time, it is clear that differences in engineering capability, technological sophistication and adaptability, industrial structure, managerial flexibility, patterns of work organization, labour productivity and the communications and information network can markedly affect the minimum efficient scale in the sector. This means that specific data on minimum efficient scale, such as that presented in table 4, can only be seen as

presenting the most general frame of reference for discussion purposes. But at the same time one should note the very clear tendency for the value of the minimum efficient scale to fall. The most recent figures of above 200,000 as efficient production levels contrast sharply with the much higher figures that have often been quoted in the literature, and appear to put the efficient production of automobiles back in the realm of possibility for more than a tiny minority of developing countries.

Table 4. Estimates of the minimum efficient scale of production in the automobile industry

Publication date	Author	Country of reference	Estimated minimum efficient scale (units/year)
1956	Joe S. Bain	United States	600 000
1958	George Romney	United States	400 000
1969	Society of Automotive Engineers of Japan	Japan	240 000
1971	C. F. Pratten	United Kingdom	250 000
1982	Stuart Sinclair	World	200 000+

Sources: Row 1 - Bain [47]; rows 2 and 4 - White [18]; row 3 - Society of Automotive Engineers of Japan, Zidosha Kogaku Handbook (Tokyo, Tosho Publishers, 1969), quoted in UNCTAD [15]; row 5 - Sinclair [48].

Note: Due to publication delays, the figures given in the table will generally refer to the technological situation some time prior to the publication date given.

Nevertheless, the engineering, technological, managerial, and information requirements mentioned above are binding constraints on many of even the more industrially advanced developing countries, and mean that even at the, for them, relatively high output levels (of plus 200,000 units), production can still be, in international terms, inefficient and non-competitive. And these are minimum figures for just one model. For a modern automobile producer to be both internationally competitive and profitable a figure of up to 2,000,000 units per year is still considered valid ([28], [49]). Taken together, this suggests that in almost all cases the attention of developing countries is best devoted to the production of components or other segments of the vehicle sector and to fostering policies of southern content.

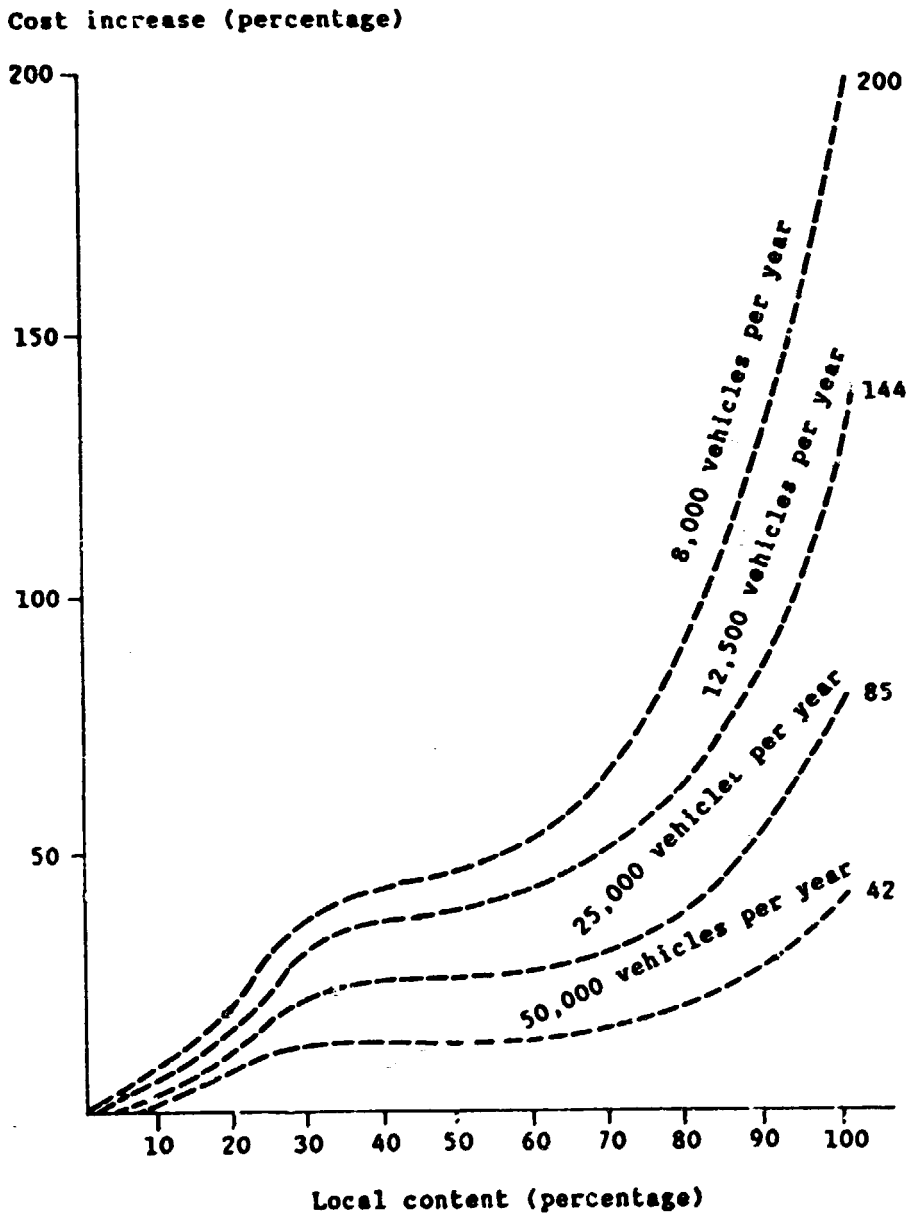
The production of commercial vehicles, on the other hand, particularly in the medium-heavy (over 5 tonnes) range, is much less subject to scale economies. Thus, most major producers in developed countries manufacture between 20,000 and 40,000 medium-sized, and between 5,000 and 6,000 heavy vehicles of a given model ([31], pp. 20-21). These estimates should, however, be interpreted with care, since most were based on technology in use in the early 1970s; and it must not be forgotten that the market for such vehicles is also much smaller than for automobiles, and the importance of finding the right niche even more critical. The situation with respect to economies of scale, as well as market size, is also much more favourable for so-called low-cost vehicles [50].

The fact that scale economies escalate from relatively modest level for completely-knocked-down assembly to high levels for manufacturing particular key components, and even higher levels for complete production of automobiles, has obvious implications for production costs at varying levels of local content. If the market is small, rising local content leads to higher production costs. As will be seen, however, in at least some developing countries, the problem is not so much that the domestic market is too small to justify a relatively high degree of localization, rather it is the fragmented market structure, which in turn is often the result of poorly designed government policy which encouraged the proliferation - or at least did nothing to discourage it. This being said, it is undoubtedly true that for developing countries with small markets, complete or near-complete local integration has very high-cost penalties.*

One attempt at representing the cost penalty of local content (for Brazil) is shown in figure I. At a low level of local content (up to about 20-25 per cent) different scales of output appear to make relatively little difference to costs over a range of 8,000 to 50,000 units per year, while above that level, cost increases for small-scale production become high. And when local content exceeds 65 per cent, cost disadvantages of small-scale production are enormous (this corresponds roughly to the body stampings stage which entails appreciable economies). Such an attempt at depicting the relationship between local content and cost at varying production scales cannot, however, be generalized to all developing countries, since it depends, among other things, on the industrial structure of the specific country, the sophistication and efficiency of application of the technology employed, and the degree of refinement of the local content policies applied.

*Clearly export promotion is one possible solution to the problem of limitation of domestic market size, but export promotion in the automobile industry, without a fairly long period of protection, has not been possible for any developing country. The technical complexity of automotive production requires a lengthy period of learning before international competitiveness can be attained.

Figure I. Cost increase as a function of local content



Another major factor that tends to raise production costs in developing countries is the technical complexity of many components. As was mentioned previously, this is reflected in the high initial costs of importing and, more importantly, of assimilating the technology in terms of quality problems, delays, rejections and the learning process. Over time, these costs tend to fall as producers gain industrial experience. These two factors - scale and technological complexity - combine to make the costs of launching automotive production extremely high.* If localization is pushed too far and too fast, and if the policies are not sufficiently sophisticated, the consequence can only be inefficient production. Experience suggests that a successful local content programme can require a gestation period of 20-25 years, during which time the legislation must pass through a number of stages, each of which must be flexible in its implementation.

The discussion has focused on the minimum efficient scale in the automotive sector because the attainment of economies of scale is traditionally seen as the key to attaining the cost reductions that will allow a firm to produce competitively. While the case for the production of passenger cars in developing countries appears only potentially promising for a few developing countries, the outlook for production of commercial vehicles appears brighter, and that for vehicle components even more promising, at least from the point of view of the volume of output required to attain economies of scale in production. Although this discussion has been confined to the vehicles sector, the capital goods industry in general is characterized by economies of scale, and scale considerations must always be taken into account. In fact, however, the situation is more complex - and much more challenging - than a simple examination of the minimum efficient scale would suggest.

Thus, while the stage of complete automobile production has been reached in selected developing countries or areas, including Malaysia, the Province of Taiwan and the Republic of Korea, at least in the latter two cases it has also been pointed out ([11], [42]) that this production was fostered by United States and Japanese producers** primarily to circumvent the voluntary export restraint agreement between the United States and Japan, and more recently to reduce the volume of Japanese imports into the United States, and

*These are not, of course, the only reasons for high costs found in many developing countries. Other factors include the taxes and tariffs on components and raw materials, and the cumulative effect of import substitution policy on the cost of input.

**The Hyundai Pony is a multinational product, with a Mitsubishi engine and transmission, a body designed in Italy (and partly stamped out in France), mechanical and electrical components and technical assistance from the United Kingdom, and financial support from Barclays Bank and other overseas institutions (see Bloomfield [46] for an extended discussion of these developments).

not because of the product cycle, economies of scale, lower labour costs etc. Indeed, even though in 1980 hourly wage rates in vehicle production in Japan were seven times that in the Republic of Korea, the Ministry of Commerce of the Republic of Korea has estimated that in 1979 Hyundai's production cost for the Pony built in that country was \$3,972, compared with \$2,300 for a Toyota Corolla made in Japan [19].

Further, even if production is efficient, it is only so for the technology employed in the developing country. But because of the very rapid introduction of new materials and new technologies into automotive production [25], there will be a continuous movement downward and outward of the supply functions of the transnational corporations, and it will be exceedingly difficult for developing countries to match these advances and remain competitive. This is particularly true since the introduction of new materials and new technologies generates an ever smaller labour input, and hence fresh possibilities for savings through lower labour costs. To quote from the results of the Massachusetts Institute of Technology study on the future of the automobile industry: "The future for anyone plotting a low-wage, high-labour-content strategy to gain world export markets is bleak" [19].

The nature of these advances underscores the necessity for developing countries to negotiate agreements with the transnational corporations to ensure that component producers in those countries will enjoy the benefits of the new developments. And a key policy instrument for developing countries to use in the negotiations is local content legislation. While in most cases the transnational corporations, as the purveyor of the advances, may be seen to have the upper hand, those developing countries with relatively large internal markets can use local content legislation literally to charge admission to their (potential) domestic markets (but they must shop intelligently). On the other hand, by offering preference to southern multinational enterprises, developed countries could also use local content as a vehicle for fostering the development of an independent southern capital goods sector.

2. Local integration of the automobile industry in Argentina, Brazil and Mexico

The development of the automobile industry in Argentina, Brazil and Mexico - the three largest producers in Latin America, and among the largest in developing countries - set the pattern of assembly operations, followed by components import substitution and local integration, and leading to the maximum possible degree of local content, which was to be repeated in other developing countries that attempted to set up an automobile industry. Since the early 1970s, outward orientation began to assume its importance and took the form of export promotion in Brazil and Mexico and import liberalization in Argentina.

The early phase of the development of the automobile industry was characterized by assembly activities with minimal local content and high import dependence. In Brazil, imports of vehicles and

parts accounted for 11 per cent of the total import bill in the early 1950s, and a similar level of imports was reported in Mexico ([31], p. 101). The heavy import dependence naturally gave rise to concern and was a chief motivation for designing policies aimed at the establishment of an integrated automobile industry. The package of government policies included heavy protection (both tariffs and import restrictions), very liberal treatment accorded to transnational corporations, various tax concessions and large fiscal and exchange subsidies for foreign investments.

The local content requirements were imposed in the late 1950s in Argentina and Brazil and in the early 1960s in Mexico, and the various regulations aimed at a highly integrated automobile industry. Local content was to be 98 per cent for trucks and 99 per cent for cars by 1961 in Brazil, 80-90 per cent by 1964 in Argentina, and 60 per cent by 1964 in Mexico ([51], pp. 53-54). With its imposition of local content requirements in 1962 Mexico effectively gave birth to the Mexican automobile industry [52], and saw the measures as a means of conserving foreign exchange, creating jobs, and promoting other related industrial sectors of the economy.

The immediate consequence of the various policies was the proliferation of firms in all three countries. In general, "all the firms that met the requirement of promotional legislation had their investment plans approved, and no attempt was made to limit the number of firms entering the industry" ([31], pp. 105-106). Argentina alone attracted 21 assembler firms; there were eleven in Brazil and eight in Mexico. Though the number was reduced during the 1960s, overall market fragmentation remained mostly unchanged. The reason for the proliferation of firms lies in the fact that once a transnational corporation sets up manufacturing and assembly activities in a protected and lucrative market, the other firms, if permitted, have little choice but to follow suit in order to safeguard their market shares. Further, the industrial policy-makers in the countries in question failed to develop the appropriate policies to harmonize with the policy-making being carried out in their foreign trade and external finance sectors. And in reality, the situation was even worse, since local content policies for different sectors were also not co-ordinated.*

*At this point one should at least mention what is perhaps the most startling use of local content in the automobile industry. In 1964 the Government of Chile prohibited imports of foreign-built cars in order to protect and foster domestic production. At the same time, a minimum local content requirement of 27 per cent was imposed and the percentage was raised every year. Maddison [53] presents estimates which suggest that Chile paid from \$2 to \$4 of domestic resources for every dollar of import substitution in the automotive industry. New firms that wished to enter the industry were forced to locate 1,600 km from Santiago. As domestic aviation was heavily subsidized and aircraft were imported at a favourable exchange rate, some of the finished cars were delivered to Santiago by air.

(a) The role of transnational corporations

The liberal policies towards transnational corporations as reflected in the general lack of screening and restrictions of direct foreign investment resulted in a situation where the transnationals' better access to capital and technology gave them the decisive edge over national firms [51]. During the 1960s the major transnationals increasingly penetrated the market and acquired former licensees and local firms, aided by the lack of government action to strengthen the latter (by means of mergers, for instance). By the late 1970s, transnational corporations accounted for over 95 per cent of the terminal industry in Argentina, Brazil and Mexico ([31], p. 108).

More importantly for the purpose of assessing local integration strategy, penetration by transnational corporations in the components sector is also extensive. A large part of the technologically more sophisticated parts and components are produced by foreign firms. The tyre industry, for instance, is almost totally accounted for by the major transnationals. In the early 1970s, about half of the production of components was by foreign-owned firms - 50.4 per cent in Argentina (1972), 47.5 per cent in Brazil (1974), 65.6 per cent in Mexico (1970).^{*} Recent data do not show any sign of the process slowing down, although the precise extent is not known. In Mexico, among the ten principle component firms, eight have equity participation from the United States. In Argentina, a majority of the 50 firms that account for three-quarters of the market have foreign participation.

The evidence on Brazil is unclear. One source reports that transnational corporations are the principal suppliers to the foreign vehicle producers, the latter relying on equity holding in parts producers to increase their control and "at least 15 of the main products required by the vehicle industry have been so verticalised" ([25], p. 120). "Of the 100 major suppliers, 52 had foreign equity participation; and half of the local supplies purchased by Volvo of Brazil came from transnational corporations or foreign affiliates" ([25], p. 135). At the same time, a World Bank study on Brazil found that, in order to meet the local content requirement, Volkswagen, by far the largest producer and exporter, had developed local suppliers who were given technical training and financial assistance. "In 1957, VW had 150 suppliers, increasing to 1,300 in 1965, 3,000 in 1970 and 4,300 in 1974 (only 900 of which were foreign). Many of the suppliers produce not only vehicle parts, but also machines, machine tools, castings, forgings etc. which were also used in other industries. The auto industry had helped to stimulate Brazilian technological developments in industry through backward linkages to such suppliers of parts and components and probably even further back to basic industries such as steel, glass, rubber and plastics." (World Bank [54]).

^{*}This may be compared with other Latin American developing countries where liberal policies requiring less local content have been adopted, but where there is less foreign penetration (see UNCTC [31], p. 108).

The important issue so far as externalities are concerned is the extent of indigenous (Brazilian) involvement in the suppliers industry and the learning as a result of linkage formation. The evidence given by the above World Bank study, as well as results of other World Bank work (for example [55]) which emphasized the rise in the "rationalization index" - defined as the share of domestic (as opposed to imported) equipment purchased for investment projects - during the 1970s, is inadequate in this respect, for it does not reveal the nature and significance of the operations of the large numbers of Brazilian suppliers. Yet the foregoing optimistic conclusion depends crucially on the extent to which key national suppliers are indeed local and not merely foreign affiliates situated in a developing country, are engaged in the technologically more sophisticated sectors of automotive component manufacturing, are co-ordinated with overall macro-economic policy (which the World Bank study [55] argues was not the case) etc.

Against the general background of the permissive open-door policies towards transnational corporations, it is no coincidence that in the three countries with the highest local content, participation by foreign-owned or -controlled firms is most extensive. It has been noted that a chief consideration behind the local content regulations was the saving of foreign exchange. But in forcing the pace of increase in local content, greater participation by transnational corporations was all the more necessary to reach the demanding targets (given the relative weakness of domestic firms). The result of this is the creation of a large transnational network of terminal and component firms which in many respects is a reproduction of the subcontracting relationships found in developed countries. As a corollary, the linkages with indigenous firms, and hence the various potential technological and other spin-offs which would have accrued to them, were minimized. Thus, the objective of foreign exchange saving has often been in conflict with the goal of fostering an indigenous suppliers' industry and capability.

Moreover, despite the emphasis on the conservation of foreign exchange, the industry continued to have a negative impact on the balance-of-payments in the early 1970s. This reflected an outflow of profits and royalties to parent firms and a continued inflow of imports of machinery, parts and components, and raw materials. The outflows were not compensated for by exports, partly because the automobile products were still uncompetitive, and partly because of the restrictive practices by transnational corporations limiting exports in many agreements. In Brazil, vehicle producers represented a net outflow of foreign exchange of \$114 million in 1974, equivalent to 12.2 per cent of the country's balance-of-payments deficit. In Argentina, the vehicle manufacturers had a trade deficit of \$80 million in 1971, equal to 20 per cent of the total payments deficit over the 1971-1975 period. In Mexico, six transnational corporations producing vehicles had trade deficits of \$143 million in 1971, equivalent to over 16 per cent of the total trade deficit in that year ([31], pp. 113-114). While these data do not show the precise impact of the local integration strategy on the balance of payments, they suggest that the amount of foreign exchange saved (compared to a situation without the local content

policies) was probably not that significant. Nevertheless, in a long-term analysis, a local content policy could still be deemed successful because of the multitude of objectives at which the policy could be said to be aimed.*

(b) The situation in the 1970s

The industry in the early 1970s was still characterized by inefficient production. A study of the effect on production costs of the small average firm size concluded that "the average Argentinian car in 1967 cost 122 per cent more than in the country of origin. Fifty-seven per cent, or almost half of this excess cost, could be accounted for by the low scale of production in Argentina and this could be further broken down into 44 per cent accounted for by differences in scale economies in the terminal industry and 13 per cent by differences in the parts industry" ([51], p. 198). In the case of commercial vehicles, the requirements for virtually full domestic value by the end of the 1950s and early 1960s led to local production of some very complex parts at extremely high cost, which contributed to the high prices charged for those vehicles. It was not until the 1970s, that is, after a fifteen-year learning period, that levels of output were reached which supported efficient production of those items ([55], p. 44).

Apart from the mushrooming of firms already mentioned, oligopolistic practices of transnational corporations gave rise to a proliferation of models and their frequent changes. Product differentiation was heavily relied upon after the initial boom years, once the demand slowed down. The range of models produced by the nine most important car producers in Argentina increased from 10 in 1960 to 48 in 1974. In Mexico, the number of models produced has fluctuated around 40 since 1965. The average production was 4,950 units per model in 1975, about the same as in Argentina, and well below the minimum scale requirements taking into account the levels of local content ([51], pp. 185 and 199). Hence fragmentation of the automobile industry in the major Latin American producing countries has been a much more important factor in explaining the high price of locally produced vehicles than the small absolute size of the market. In other words, a high level of local content would not necessarily be incompatible with efficient production if the industry were rationalized.

*Such legislation may also serve other purposes. In Mexico, government regulations strengthened the country's bargaining position in negotiations with International Business Machines and led to an increase of over 1,300 per cent in the capital investment to be made by that corporation in Mexico, as well as to the agreement that it would develop a horizontal industry including largely Mexican suppliers (see The New York Times, 24 July 1985, p. A1).

Since the early 1970s, local integration strategies have been reformulated in response to the problems that beset the automobile industry. The major problems, as discussed above, were the continuing balance of payments difficulties and the costly production. Broadly speaking, Brazil and Mexico have devoted greater attention to export promotion, while export promotion and import liberalization have been pursued jointly by Argentina. This outward orientation represents a shift of strategy away from relative self-sufficiency with only limited links to the international economy to one that is more integrated into the location and production plans of the transnational corporations. Nevertheless, as a result of the previous localization programmes, local content in the three countries has been progressively rising so that by the 1970s the ambitious targets set earlier have been largely achieved. In Brazil, approximately 90 per cent local content was reached, in Mexico 58 per cent, and in Argentina 80 per cent ([25], p. 149).

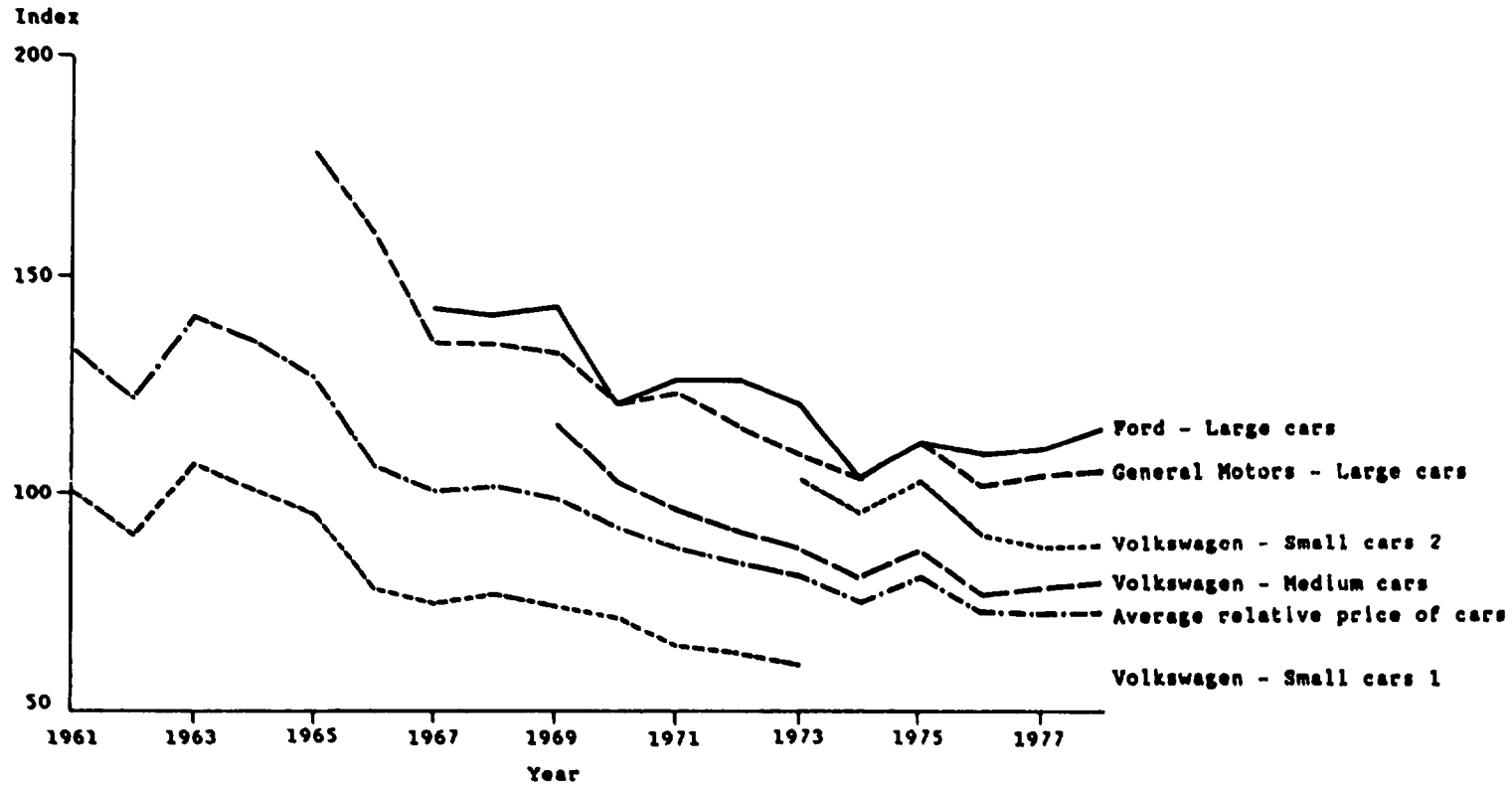
As a result of the foreign exchange crisis of the early 1980s, and of the excessive costs arising from the fragmented state of the market and its incompatibility with export promotion, the Government of Mexico issued a decree in September 1983 that further increased the minimum levels of local content - from 50 per cent in 1984 to 60 per cent in 1988 for passenger cars, and from 65 per cent to 70 per cent for light vehicles - while also requiring each manufacturer, over this four year period, to reduce their range to a single type, available in up to five models. In addition to these efforts at reducing fragmentation, the industry was also required (by an unspecified date) to become self-financing for the foreign exchange needed for component imports.

At the same time there is evidence, at least in Brazil, of an increasing efficiency in automotive production. Indirect evidence is supplied by the average weighted index which shows that the relative price of a Brazilian passenger car fell by 100 per cent during the period 1961-1978 (see figure II). Moreover, prices of Brazilian vehicles compare favourably with those of similar foreign models (World Bank [54], p. 122).

On the basis of this account of the development of the automobile industry in the three Latin American countries, it might appear that the traditional industrialization strategy of a period of import substitution leading to export promotion has been vindicated by the Brazilian and perhaps the Mexican automobile industry. Thus, the World Bank study [54] concludes that "the rapid development of the Brazilian auto industry over the past 20 years is a success story of infant development". While a full assessment of local integration strategy - even if it were possible - is not appropriate to this study, such a confident pronouncement must be critically examined.

First, although the data on Brazilian price efficiency seem to suggest that the problem of costly production observed in the late 1960s has been solved, caution is necessary. As the same study points out, for example, while the Brazilian prices are lower than those of the foreign vehicles, they are not directly comparable

Figure II. Evolution of Brazilian car prices, various models



because of differences in quality. Moreover, the factors that brought down the costs need to be understood. To what extent was increasing efficiency due to economies of scale and to technological learning? It would appear that since the cost improvements were mainly made before 1974 - that is, during the "miracle" growth period when the automobile industry saw rapid expansion - they were largely attributable to increasing scale. If this is true, and given the fragmented market, then the cost efficiency of the Brazilian industry was conditional upon rapid growth of the economy. And once the economy stagnates or declines, as in recent years, the cost problem may once again come to the fore unless rapid export expansion is achieved.

Moreover, the Brazilian case is somewhat special because of the relatively large domestic market. Certainly the market of few other developing countries can support the type of proliferation of types and models found in Brazil. Recent data on the market structure suggest that the proliferation of models persists, and not only in Brazil but in all three countries (see table 5). On the other hand, such data conceal the wide variations in scale between different firms and models, and firms such as Volkswagen in Brazil and Mexico account for a large part of production in the two countries, and are therefore in a relatively good position to reap the benefits of economies of scale. But, on the other hand, the efficiency of other segments remains a serious problem.

Table 5. Car models produced and average output per model, 1980

Country	Models	Average output per model
Argentina	33	6 622
Brazil	79	12 301
Mexico	40	7 576

Source: UNCTC [31], p. 110.

With respect to the export performance which might indicate the success of an industry in reaching maturity after a protracted period of protection, certain points again need to be borne in mind. The dramatic expansion of exports has been mainly the result of generous government incentives as well as pressure on the automobile firms. To preserve or expand their market shares, the firms were required to undertake export promotion. The value of fiscal incentives granted to the Brazilian automobile industry was 62 per cent of the value of exports in 1971, and 67 per cent in 1975 ([31], p. 116). Under the BEPIEX scheme introduced in 1972,

exporters were exempted from restrictions on imports and received large deductions in various taxes on imported equipment, components and intermediate products. In addition, a 26 per cent export subsidy was given.* In Mexico, exporters received fiscal incentives equal to 11 per cent of the exports, and various tariff incentives were also provided to those which met local content and export requirements. Fiscal and various incentives and subsidies in Argentina could add up to around 60 per cent of the export price for cars and 75 per cent for heavy trucks ([31], pp. 115-116).

All of this suggests that the costs of export promotion in terms of revenues foregone by the Governments have been very large. It also raises the questions whether a reduction in incentives could generate the same level of exports, and whether the automobile industry in these countries has really matured and is internationally competitive in the longer term. For one thing, the policies adopted towards transnational corporations made no attempt to restrict their numbers, and their take-overs of national firms continued over the period. There was also a failure directly to rationalize the structure of the industry and adequately strengthen domestic industrial capability, and the pace of local content increase was determined without due regard to local capacity.

The impact of the local integration strategy on the balance-of-payments and employment is extremely difficult to evaluate. Up to the early 1970s there were continuing deficits associated with the automobile industry, and it is doubtful that the foreign exchange saving was significant. Since the early 1970s, the deficit attributable to the automobile industry has been turned to a surplus in Brazil thanks to the rapid expansion in exports, while the Argentinian and Mexican automobile industry continued to exhibit deficits. With regard to the employment impact, the increasing capital-intensity as local content is raised makes the automobile industry a poor and costly source for generating employment opportunities.

Perhaps an even more important question is the impact of local integration strategy on linkages and technical progress. In this respect, although the evidence is far from complete, the result appears to be disappointing. Under the open-door policy there has been a denationalization in the terminal industry and the components sector has come under foreign dominance. Consequently, the technological and other spin-offs which could have strengthened the indigenous industrial capability have been smaller than expected. One important contributing factor in this respect has been the failure to integrate industrial and commercial policy on local content with technology policy. In conclusion, it is not clear whether the high costs associated with the type of local integration strategy adopted in the three Latin American countries in the form of subsidies to the automobile industry by both the Government and

*This subsidy was granted on the condition that production had at least 78-95 per cent local content, depending on the type of vehicles (see World Bank [54], p. 121).

the consumers has paid off. Certainly, the policy would have been a greater success had there been a greater degree of harmonization of different elements of government policy, had stronger measures been taken to control fragmentation of the market, and had more attention been given to monitoring the total costs of the local content programme and the presumed benefits from linkages to other sectors of the economy.

3. The Peruvian automotive industry and linkages

An examination of the Peruvian automotive industry provides an important supplement to the previous section and focuses on the linkage aspects of local integration policies, an important area which has been generally neglected.* Partial assembly mainly of commercial vehicles began during the 1940s in Peru. Under the import substitution strategy, a local content requirement of 30 per cent was decreed in 1963 to be achieved within five years of initiating production ([51], p. 56). As in the other Latin American countries, an open-door policy was adopted. Thirteen firms (nine of which were passenger car firms), each with some foreign ownership, were assembling 18 makes and over 25 models of vehicles by the late 1960s. The total number of vehicles produced was around 12,000, which meant that average output per model was around 500.

In this highly fragmented market, even the largest producer used no more than 30 per cent of the installed capacity. Beginning in 1970, when the costly policy became all too obvious, a degree of rationalization in the context of the Andean Pact programme was carried out and five assemblers were selected to produce vehicles classified by type of use and weight, and no assembler was permitted to enter the market before 1981. Following these measures, the number of vehicles assembled grew considerably up to 1978, when Peru was hit by economic recession. But even at the peak of production in 1976, the average number of vehicles produced by each firm was no more than 7,000.**

Despite the relatively modest local content goal set in the early 1960s, the actual achievement fell far short of it - around 10 per cent in the late 1960s. This was because of the relatively underdeveloped industrial capability, the small and fragmented market, the lack of standardization of components which hindered economic production of high value-added components, and the inadequate local integration strategy (see below). In spite of the failure to meet the target, the local content requirement was revised in 1969 to 70 per cent. By 1974, the number of component and parts suppliers grew to 191 (including 33 producers of car bodies and related products). Of this group, most of whom were small-scale producers, 11 had foreign equity participation.

*The information is drawn from UNCTC [56], unless otherwise specified. For a general discussion of vertical linkages and transnational corporations, see Lall [57].

**The largest producer, Chrysler, produced around 10,000 vehicles, while the smallest, Volvo, had an output of 1,100 in 1974.

Unlike its counterpart in the other Latin American countries examined, the Peruvian components sector has not seen the same degree of denationalization, though firms with foreign interests did occupy the more important components sectors. This appears, however, to be due less to a conscious government policy to restrict foreign participation than to the small market. The local content reached in 1973 was between 25 and 35 per cent ([51], p. 61), but the distinction between real and nominal local content ought to be noted. The high target set for 1973 was repealed because of difficulties in meeting the requirements to allow the inclusion of all Peruvian inputs as local content regardless of their import content. This "makes local content requirement next to useless as a policy tool: in Peru, 95 per cent of tire producers' and 54 per cent of components suppliers' raw materials are imported" ([25], p. 131).

The study of linkages based on a sample of firms reveals a number of things. Locally replaced components were often relatively simple metal items (springs, fuel tanks, brackets, radiators, various nuts and bolts etc.), some relatively simple unrelated items (glass, mirrors, seat covers etc.) and a number of relatively complex unrelated items (tyres, tubes, paints, electrical cables). Notably, the latter were produced by foreign affiliates, although some local firms were also producing under foreign licence. The largest proportion of the value of items purchased from outside firms was accounted for by tyre firms owned by transnational corporations. Technologically sophisticated or large-scale capital-intensive production was beyond the capability of local suppliers and had to be imported. It was also found that production costs for many local components were much higher than for comparable imports.

The government did not specify the items to be produced by foreign assemblers and firms and by local suppliers. This non-distinction renders the formation of local linkages, technology transfer and assistance to indigenous producers more difficult because, if permitted, the transnational assemblers would take the easier route of either in-house manufacture or subcontracting to other foreign firms, even where indigenous suppliers, given assistance, might attain economic production in the longer term. The policy adopted was designed simply to avoid the extra costs of seeking and launching new suppliers, transferring technical knowledge, and upgrading the capability of the suppliers. Not surprisingly, few, if any, of the local component firms were launched by the foreign assemblers; most of those firms owed their existence to the market for spares and replacements before the assembler firms began operations in Peru. Furthermore, it was discovered that the technical linkages created were minor and mainly took the form of quality control. And "though there are quality control procedures, these seem to be very simplified and are often obviated by keeping in-house the production of items that require more quality control" ([56], p. 44).

More advanced forms of technical linkages involved assistance in design improvements, or actual in-house design and development work by the assembler to suit the capabilities of the supplier, and assistance in solving production problems which already existed.

The lack of technology transfer and other assistance could be attributed to deficiencies in the local integration policy, which simply stipulated the local content requirement and failed to facilitate stronger co-operation (where feasible). As a result, the transnational assemblers simply fulfilled the local content requirements by purchasing mostly standardized simple items from the local suppliers. And there was little incentive for the transnational corporations to establish any closer technical linkages with the larger suppliers, since the latter mainly produced technologically unrelated items. In sum, transnational assemblers in Peru have not formed the type of close linkages which could result in a transfer of more sophisticated technical know-how to the local suppliers and a long-run upgrading of their technological capability.

There was also no attempt made to assist or merge the large number of small component firms producing simple items. The keen price competition between the producers made their position vis-à-vis the large assembler firms even weaker and probably hindered the development of a strong local components industry.

In conclusion, the linkages formed in the Peruvian automotive industry have given rise to increased production and thereby increased local value added and employment. To this extent, some benefits have been gained. However, the benefit from an upgrading of technological capability of component suppliers has not been maximized by an appropriate integration policy. Furthermore, the costs of fostering an automobile industry with suboptimal scale must have been large. The market in 1980 remained fragmented with five car models and an average output of 2,140 ([31], p. 108) and the recession has further exacerbated the problems of the industry. Price efficiency therefore leaves a great deal to be desired, and exports from the automobile industry have been negligible. The infant, after two decades or more of production and local integration strategy, has hardly reached the adolescence stage.

4. Local integration in the Indian commercial vehicle sector*

Assembly operations were initiated in the Indian automobile industry in the inter-war period. After independence, the Government promoted national ownership of production facilities and set a target of 56 per cent local content by 1956. By 1969 all assemblers had indigenous content in excess of 94 per cent. Constrained by the low level of incomes, faced with the problems of older technology, and allocated relatively low priority by the Government, the passenger car sector has, however, been stagnant for years. The take-over by Suzuki of production facilities in 1984, with the promise of attaining 70 per cent local content within three years [48], could, however, augur well for the future. The commercial vehicle sector, on the other hand, is one of the success stories of local integration strategy.

*This case-study draws mainly on UNCTC [56] and Lall [58]. Other information comes from UNCTC [31] and Chaudhuri [59].

Unlike the fragmented market of many developing countries, the Indian market for commercial vehicles is almost entirely accounted for by two manufacturers (AL and TELCO)* which supply over 90 per cent of the heavy trucks (over 7.5 tonnes) in India. In 1978 TELCO made around 35,000 vehicles, and AL 9,000 of essentially one model, both large enough to gain the scale economies of truck manufacturing (normally reckoned to be reached at 5,000-6,000 units, though for certain components the required volume is higher). Strict quality control, production adaptation, improvements based on indigenous research and development and government encouragement have led the two leading truck manufacturers to emerge as major exporters (mainly to developing countries), AL and TELCO exporting around 10 and 15 per cent of their output, respectively. Exports of trucks make up a substantial proportion of automobile exports (about 62 per cent in 1977). More recently, TELCO has itself gone multinational with a joint-venture affiliate in Malaysia and licensed assembly operations in other developing countries. Furthermore, exports of components rose from \$6 million in 1970 to \$66 million in 1978. All of this suggests that the Indian commercial vehicle sector has come a long way in achieving international competitiveness. Indian commercial vehicle technology, however, is not as modern as that of developed country manufacturers; its design is relatively old; and its engines are not as fuel-efficient. Nonetheless, the trucks are well-known for being rugged and appropriate to the type of conditions prevalent in many developing countries.

While in 1956 imports amounted to between 35 and 45 per cent, in compliance with the local content regulations enforced by the Government, both manufacturers lowered their imports to less than 4 per cent of their total requirements by 1979. The commercial vehicle sector is an example of a successful local integration strategy which has resulted, therefore, in efficient production after a period of learning.

Linkages in the commercial vehicle sector are extensive; AL bought out components and parts equivalent to 59 per cent and TELCO 35 per cent of sales, while keeping the rest for in-house manufacture. Apart from the relatively developed industrial capacity, and the scale factor which enabled efficient components production, the local integration policies of the Government have influenced the creation of extensive linkages. It has prevented the terminal firms from acquiring suppliers through its monopoly and foreign investment regulations, and from expanding into their activities by its licensing policies.

The government also actively encouraged the growth of a supplier industry by specifying (since 1965) a reserved list of items

*A transnational corporation (British Leyland) has majority ownership of AL, while TELCO is almost entirely owned by a group of Indian companies, though Daimler-Benz, the original licensor, still has some non-voting equity.

that had to be bought out, subject to price and quality considerations, from independent firms and by providing various incentives to small-scale producers. The implementation of the reserved list was gradual and pragmatic. Most of the items reserved for independent suppliers were, by traditional truck manufacturers' practices, farmed out in any case. While some had initially been produced in-house, the installed capacities were allowed to be used, and only additional output was to be farmed out. Furthermore, "the clause regarding satisfactory cost and quality meant that the farming out was achieved without damaging performance, and with due regard to the 'learning' period required by new suppliers to reach the required standards" ([58], p. 213).

The reserve list policy induced the automobile firms to search for and develop new suppliers. It accelerated the process of dividing optimally the operations between the automobile firms and their suppliers. The former incur the costs of locating and launching the latter, in return for the longer-term benefits of cheaper supplies. The truck manufacturers have found local procurement cost-efficient after the initial investment and provision of all sorts of assistance. Such effort was probably justified on broad macro-economic grounds, for it led to a wide network of local supplier industries which, after a period of protection, had grown up, and, in contrast to the Peruvian experience, to extremely widespread technical linkages. These have given rise to a great deal of learning and its diffusion. Technical knowledge has been transferred through various mediums, ranging from input specifications and systematic quality control, through joint design and assistance in production techniques, to in-house design and development work (by the manufacturers) to suit the capabilities of its suppliers.

The type of externalities mentioned are extremely difficult, if not impossible, to quantify, but such difficulties should not deter investigation in a murky but vitally important area. The UNCTC [56] and Lall [58] studies on vertical linkages in the Indian and Peruvian automotive industries are noteworthy for the insights offered into the process of linkage creation, and they also show how variations in government policies in the two countries have made the difference between success and failure.

Benefits apart, there may certainly be social costs associated with the initial inefficiencies of pushing the pace of local procurement, and with the risk of monopolistic-type collusion by the firms involved in the linkage formation. But as Lall ([58], p. 244) concludes, "there seemed little evidence in our case study that these costs were significant in the longer term". Admittedly, the conclusion has deliberately abstracted from an evaluation of the broader import-substitution industrialization. To the extent that these costs may be high, they have to be taken into consideration.

5. The automotive industry in the countries of the Association of South-East Asian Nations*

In the early stages of the development of the automotive industry in the countries which comprise the Association of South-East Asian Nations (ASEAN) - Indonesia, Malaysia, the Philippines,

Singapore, and Thailand - the objectives for establishing a local assembly industry were usually cited as employment creation, foreign exchange savings and technology transfer, with the latter associated to some extent with possibilities for developing inter-industry linkages. These objectives were set, however, without any rigorous criteria or machinery for monitoring performance, and most of these schemes did not set out in the initial period to achieve high levels of local content. Thus, the programme for developing local content in the Philippines - one of the most ambitious undertaken in developing countries - proposed a schedule which, had it been adhered to, would not have passed the 60 per cent mark until 1985** and the Malaysian Government - whose national car project represents a major departure from observed behaviour in ASEAN countries, and which signalled the de facto end to the ASEAN efforts to co-operate in making a joint car - is only aiming at a 36 per cent local content target by the end of the 1980s, a goal which represents a doubling of the level attained at the middle of the decade.

Recently, increased attention has been devoted to the foreign exchange implications of local content and related policies in the industry, and less to the old objectives of employment creation, technology transfer and inter-industry linkages. It seems agreed, however, that on this criterion the automobile industry in ASEAN does not perform well. Thus, all countries of the region - except Singapore, which effectively ended local assembly operations when it removed tariffs on fully assembled cars in 1980 - have been trying to reduce their reliance on imports of fully assembled vehicles and to develop local assembly and production as the major source of supply, often introducing "inordinately high levels of effective protection" (World Bank [61]) to achieve this end. But so far the trend has not been sufficient to reduce the import bill, and indeed Japan, the major supplier of vehicles to ASEAN, has continued to expand its sales in the region.

Viewed generally, the development of the industry has in no country (with the exception of recent declarations in Indonesia and Malaysia) been made part of a coherent industrial planning framework. This contrasts sharply with approaches to the automobile industry in, for example, the Republic of Korea and the Province of Taiwan, where automobile development has been firmly within a setting of expansion of heavy industry. The ASEAN region has also not been a pole of attraction for foreign investment in the sector, with Governments tending to restrict their role to tariff and local content legislation affecting the assembly and component industries, while steering away from any more direct forms of commitment. Thus far, no country in the region has succeeded in obtaining long-term involvement from important components producers

*This information is drawn mainly from UNIDO [4].

**For a detailed evaluation of local integration in the appliance and motorcycle industries in the Philippines, see Hill ([24], [60]).

to promote local technological development on a substantial scale. Here the experience of the Philippines, where major producers have been generally unwilling to provide substantial assistance to local suppliers in the absence of a guarantee of capturing in return the benefits arising from the strengthened suppliers ([24], pp. 267-268), appears typical for the ASEAN countries. The most recent example of this is the decision by General Motors to close its car plant in the Philippines, possibly for good [62].

In examining the potential for local content in the components sector in the ASEAN countries, it is important to note the differences with countries such as Mexico, in that at least part of industry production in the latter country is aimed at the world market. This type of component production does not exist within ASEAN, where the component industry has been almost entirely developed from replacement market production, the underlying philosophy appearing to have been that small firms would develop from such replacement market output towards competitive performance in the original equipment market. This focus on the domestic market has been reinforced by the fact that incentive systems have generally been oriented towards the home market.

In practice, there have been several limitations on the development of the component sector. First, there has been no consistent government support for ancillary industry output in any country of the region. Secondly, replacement items cover a much narrower range than do original equipment items, and therefore the prospects for moving from one to the other are confined to a small range of products; to go beyond that means a qualitative jump into new areas. Thirdly, and of vital importance, quality standards in the replacement market are by no means the same as those in the original equipment market. In the latter case, the producer transnational corporations are the buyers and thus the quality arbiters, and they impose requirements which are more demanding than in the replacement business. Fourthly, and related to the previous point, entry into the original equipment market almost certainly means establishing technology transfer arrangements with either the transnational corporation itself or with established component suppliers. Fifthly, the original equipment field is now one of considerable technological innovation, closely integrated with changes in design engineering, where local ASEAN firms are clearly at a disadvantage.

With reference to the new made-in-Malaysia car, called the Proton Saga, the aim of the \$320 million project is to establish a car factory with Japanese assistance that will transfer the latest industrial skills to Malaysian workers and nurture home-grown makers of car components. Because the expected output (by 1994) is still less than 120,000 cars a year, and in view of the conclusions drawn from the data contained in table 4, the factory cannot hope to attain the economies of scale necessary to become internationally competitive [63]. As mentioned earlier, however, local production of components is to rise so that by 1994 local content levels will be approximately 36 per cent, with components produced in other member countries suitable for incorporation in the Proton Saga model being treated as part of this local content.

Despite this project, Malaysia is currently in a much weaker position regarding component production than are some of its ASEAN neighbours, especially the Philippines and Thailand. In the late 1960s the Government introduced measures regarding local content, but the oil price rises and other shocks led the administration quietly to play down those schemes, presumably because of the judgement that cost rises for local content stemming from greater local inputs would have been unpalatable. So it is that the Proton Saga scheme was launched at a time when local component production covered only a very small number of original equipment items.

Moreover, the quality level of existing production appears to be quite varied, and an evaluation of the Malaysian components industry by the Japanese awarded ratings in both quality and reliability of supply only to producers who either have technical co-operation agreements with Japanese producers, as in the case of wire harness, batteries, glass, alternators, starters and leaf springs, or who are affiliates of transnational corporations, as in the case of tyres and paint. The remaining firms, which had no technical co-operation agreements, were rated poorly either in terms of quality or reliability, and sometimes on both criteria.* This suggests that the road to developing a local components industry will be slow and arduous.

The Government of Malaysia has initiated discussions with the Mitsubishi Motor Company concerning expanded possibilities for components production, and Mitsubishi has submitted a list of 282 items which could be produced in Malaysia provided quality, price and delivery conditions were met. The Government has established a co-ordinating committee for handling the components industry, and this committee is now examining the Mitsubishi list with a view to developing the more promising areas. It seems that the aim is to establish several new joint-venture companies, as opposed to expanding already-existing ones, which would conclude technical assistance arrangements with their Japanese counterparts.

Despite the negative Japanese evaluation of many components, the experience gained by local firms cannot be, and should not be, easily jettisoned. Examination of the parts industry shows that some enterprises have in fact learned very much in the components field, and even if that does not take them to the quality level set by Mitsubishi, this does not mean that their capabilities are inadequate. The results could also be interpreted as indicating the need for refinement in government policy towards the sector, including local content regulations. Indeed, the Proton Saga project is already having ramifications in other sectors of industry, where there is now a growing demand for preferential treatment through policies in areas such as local content. In launching the Proton Saga project, the government has thus thrown itself into the centre of decision-making regarding industrial structure.

*See Investigations on Automotive Industry Policy and Trends in the Market Abroad (Tokyo, 1984), quoted in [4].

By way of comparison, in Thailand automobile assembly based on completely-knocked-down kits started in the early 1960s, and in 1970 the import tariff on completely-knocked-down kits was also raised from 10 per cent to 30 per cent for trucks and from 30 per cent to 50 per cent for passenger cars in order to stimulate the domestic manufacture of parts and components.* In 1976 a target of domestic content of 25 per cent, calculated basically as a proportion of the value of the domestically produced components to the cost of production, was established. In 1978 the method of calculating the domestic content ratio was revised to reflect more accurately the technological priorities of the Government in the machine-building field.

According to a points system elaborated by the Government with a total of 100 points, some parts and components were assigned proportionately more (and others fewer) points than suggested by the relative share in average production cost, reflecting a higher (or lower) priority given by the Government. The assemblers were thus encouraged to produce those parts and components with relatively high points (for example, main body work requiring press work, which constituted one of the government priority areas). Nevertheless, they were free to choose the parts from the list. They were, however, obliged to raise the 25 points already achieved in the initial period to 50 points by the end of the fifth year.

As a result of these policy measures, the assemblers started to produce some parts and components within their own plants. However, they also began to subcontract this production to other local firms, including some which were joint ventures with foreign automotive parts and component makers. In addition to the subcontracting component makers, there are said to be several hundred small-scale units which supply the spare parts market. Domestic production was to be reinforced by the requirement to raise the local content requirement to 50 per cent by the end of 1985, but under pressure from assemblers this requirement was retracted.

Such localization was not without its costs, however, and a study by the Thai Government in the 1970s comparing the cost of locally procured parts with the corresponding c.i.f. values of completely-knocked-down parts for a small Japanese passenger car showed that the difference between the cost of processing the parts domestically and the value of the components in the completely-knocked-down kit expressed as a percentage of the latter was 60 per cent for radiators, 175 per cent for starters, 146 per cent for regulators and 180 per cent for wiper sets. A similar example from Malaysia based on 1971 data showed cost penalties of 93 per cent for shock absorbers and 152 per cent for oil filter elements [64].

The conclusion of a recent UNCTAD study [15] as to the fundamental reason why the cost difference was so high was the same as that discussed earlier for the automobile industry in developing countries in general, as well as for large parts of the capital

*This study draws mainly on UNCTAD [15].

goods sector: the small size of the domestic market for the vehicles did not permit the parts and components manufacturers to enjoy the scale economies associated with this activity in the industrialized countries. In other words, the minimum efficient scale of production of the parts and components is larger than the scale which the size of the domestic market would justify. Table 6 also shows that the domestic market, in Thailand as well as in the ASEAN countries generally, is further fragmented by numerous companies and their makes and models. Combined with the fact that the assemblers tend to engage many subcontractors in order to spread risks for missed delivery dates and a high rate of defects, the size of individual orders placed with the component makers by the assemblers is usually quite small [15].

Table 6. Fragmentation of the automobile market in selected ASEAN countries and the Republic of Korea

Country	Number of firms	Estimated number of makes	Estimated number of models	Vehicles assembled 1978	
				Total (thousands)	Commercial vehicles (percentage)
Indonesia (1977)	15	37	43	108	86
Malaysia (1977)	9 _{a/}	27	42	78	18
Philippines (1977)	14	19	48	70	50
Republic of Korea (1978)	5	10	18	158	45
Thailand (1975)	15 _{a/} b/	32	31	66	68

Source: Adachi, Odaka and Ono [65], tables 1 and 7.

a/ Only those in operation.

b/ Counting passenger car assembly and commercial vehicle assembly separately; the actual number of firms is 12.

In addition to the scale economy factor, there are certain technical weaknesses of the component makers themselves which tend to push up the production cost. According to Nawadhinsukh [66], these weaknesses are reflected in poor quality of castings (cited by five of 16 firms interviewed), poor quality of equipment (three firms) and poor production organization (three firms). Also mentioned are poor plant layout, deficiency in heat treatment technology, and lack of tooling technology for high-precision products.

The poor product quality of the components supplied may be due to the shortage of certain skilled labour (for heat treatment and alloy metallurgy, for example) and to inconsistency in the quality

of the raw materials used. This inconsistency is due at least partly to the small size of individual orders mentioned above, for the component makers are reluctant to enter into more permanent arrangements concerning the raw material procurement. Because of the small size and the irregularity of orders the component makers hesitate to invest in the upgrading of production facilities and especially in skilled manpower, particularly for quality control, which would imply high fixed costs. Furthermore, the practice of production control to ensure the quality of the products has not yet been established, since the component manufacturing activity linked to assembling is still relatively new.

Unreliability in meeting delivery dates is another complaint Nawadhinsukh found directed against automotive component suppliers. While the observance of delivery deadlines is essentially a matter of production management for these firms, from the point of view of the assemblers the observance of delivery dates is inseparable from the guarantee of product quality. Observance of delivery dates is not meaningful if the rate of rejection is high. In fact, both problems arise at the same time with component suppliers with limited production management capability, and this has been an important reason why the assemblers now tend to manufacture key components within their own plants.

The position of the pure domestic firms in the Thai vehicle components industry relative to that of joint venture firms with foreign co-operation agreements is clearly related to the degree of capital-intensity and of intensity of skilled labour, with investment per worker being 150 per cent higher in foreign than in domestic firms (in the mid-1970s). In addition, Adachi, Odaka and Ono [65] argue that the gap between these two groups of firms is widening, as the former become primarily spare parts producers while the latter become dominant in the more technologically sophisticated design- and skilled-labour-intensive manufacture of vehicle parts and components. These results appear to be representative for the entire ASEAN group of countries, and there appears a general requirement for local content policy (and tariff policy) to focus more on stimulating independent local supplier firms, as distinct from vertically integrated assemblers, since in-house manufacture (by foreign subsidiaries or foreign-controlled assemblers) markedly limits intranational transfer and diffusion of technology and deprives local firms of important manufacturing experience.

6. The automobile industry in the Republic of Korea

Until as recently as 1974, the automobile industry in the Republic of Korea was still essentially at its assembly stage with a relatively low level of local content. In that year, the Government formulated a long-term development plan for the industry. The policy objectives were as follows: a 95 per cent localization of components and parts by the end of 1975; development of an automotive suppliers industry; horizontal integration of components manufacturers; promotion of supportive systems for the automobile industry; and improvements in assembly plants and technology. First priority was given to product development of smaller cars with high

local content. Further, each of the three major firms were allocated specific segments of the passenger cars market in order to avoid market fragmentation. Under this plan, Hyundai and Saehan (now Daewoo Motor) produced 1,300 c.c. and 1,400 c.c. engine models, respectively, and KIA produced 1,000 c.c. subcompact models [67].

This is a case of a well-formulated and highly interventionist government policy aimed at local integration and subsequently export promotion. The Government has deliberately avoided an open-door policy to pre-empt the possibility of proliferation of transnational corporations and their dominance in the domestic market, with non-tariff restrictions in such areas as local content playing an important role in the protection of import-substitution industries [33]. In fact, foreign equity participation has been strictly screened and controlled to ensure a more independent industry, while foreign technical assistance was actively sought.* At the same time, as mentioned earlier, special circumstances led Japan and the United States to assist in the development of an automobile industry in the Republic of Korea [42]. These included the efforts of Japan to use developing countries in such a way that cars could be sold in third markets (particularly in the United States and Western Europe) as not-wholly-Japanese products [48].

A number of other favourable factors have also contributed to the success of the local integration strategy. First, dynamic economic growth has led to rising incomes and strong demand for automobiles. Secondly, as in the case of Brazil, the existence of machine-building experience and a considerable pool of skilled manpower prior to initiating such efforts contributed to making this successful. And sustained expansion in the supporting industries (iron and steel, electronics, mechanical engineering etc.) have made localization easier to develop - though in crucial areas such as design, metallurgy and electronics, the technological basis for their automobile industry is still judged as weak by some observers ([20], p. 90).

Finally, as mentioned above, an integrated government strategy - including a system of effective protection which has increasingly become more and more discriminatory in the incentives provided to individual subsectors (Nam 1981) - has given maximum support to the industry. Under these favourable conditions, local integration was rapidly speeded up. The main model (Pony) manufactured by Hyundai, for instance, is reputed to have a local content of 96 per cent. Underscoring the point that high local content in a developing country does not necessarily lead to inefficiency, the Pony is now internationally competitive after a period of protection of the

*Daewoo Motor has the most substantial foreign equity (50 per cent owned by General Motors). Chrysler has a joint venture for the procurement and eventual production of automotive parts, and Ford has a 50-50 joint venture with Mando Machinery to manufacture automotive components (and is reported [68] to be holding discussions with KIA Motors concerning the possible purchase of equity in the company).

industry. It is sold in about 50 (mainly developing) countries, and is expected, with the help of Mitsubishi, to continue its penetration of key foreign markets.

In addition, the high degree of local integration in the industry has been accompanied by technology transfer from transnational corporations to firms of the Republic of Korea. Technological assistance ranges from assembly know-how and training of workers to product designs and the production of engines [67]. And under a technology agreement, Ford provides Hyundai with assistance in the local procurement of components.

The domestic automotive suppliers industry has been considerably strengthened under the government policies. By the end of 1975, there were 258 subcontractors which supplied a third of the total material procurements of the three automobile firms. In recent years, the number of automotive parts firms has more than doubled to around 600. And while no detailed study of local linkages is available, it would seem that a strong domestic suppliers industry has been established and has contributed to the success of the local integration policies.

C. Local content legislation in developed countries

For purposes of comparison and contrast, the experience of developed countries with regard to local content regulations will be briefly examined. The earliest case of such regulations in developed countries appears to have been that of Canada, where they have been employed in the automobile industry since the mid-1920s [38], and where the present system of protecting the automotive industry dates from the tariff revision of 1936 [36]. Examples of regulations in several other developed countries are given in table 7, and in three of the countries mentioned (Australia, Greece and Spain) these regulations are complemented by other performance requirements, while in Australia and Spain they are also combined with export incentives.

Though often more informal, local content requirements also exist in other developed countries, recent examples of which are as follows: the switch by General Motors of sourcing from the Federal Republic of Germany to local sourcing in the United Kingdom of Great Britain and Northern Ireland - under direct pressure from the United Kingdom Government - of castings for Vauxhalls produced by General Motors in that country [69]; the United Kingdom policy of requiring 80 per cent local content in a new Nissan project [70] - 80 per cent being also the local content goal of China for the Volkswagen joint venture for Santanas by 1990 [71]; and the requirement that the new Hondas made in the United Kingdom have a 50 per cent European Community content or else they will fall under the tight quotas imposed by France and Italy on imported Japanese automobiles.

The most vigorous recent debate in developed countries - albeit a barren one, since the proposed legislation has not been passed - has been that which took place in the United States concerning the bill to establish "The Fair Practices in Automotive Products Act", which will be the focus of this section.

Table 7. Local content rules in the automobile industry in selected developed countries

Country	Local content requirement (percentage)	Import duty on cars	Local content rules established (year)
Australia	85 (can be reduced through exports)	35-57.5 per cent <u>ad valorem</u> , depending on stage of assembly 150 per cent for imports over quota	1976 (closely monitored since late 1940s)
Greece	25	11 per cent <u>ad valorem</u> for countries non-members of the European Economic Community	1964
Portugal	22 (upon Portugal's entry into the European Economic Community, replaced after four years by Community content regulation)	\$0.045 per kilo (\$400-700 per car) For imports originating in the Community, dismantled within seven years of Portugal's entry into the Community	1963
South Africa	66 by vehicle weight	100 per cent <u>ad valorem</u> on assembled cars 20 per cent on knocked-down imports	1961

continued

Table 7. (continued)

Country	Local content requirement (percentage)	Import duty on cars	Local content rules established (year)
Spain	55-60 (upon Spain's entry into the European Economic Community, replaced after four years by Community content regulation)	68 per cent <u>ad valorem</u> plus 13 per cent import tax and 24 per cent luxury tax	1964
		For imports originating in the Community, dismantled within seven years of Spain's entry into the Community	

Sources: United States [27] and author's information.

Notes: The data are for the end of 1982. The information given is not exhaustive with respect to either industries or countries.

The foremost reason behind the growing demand for a more protectionist trade policy in the United States has been the rapid growth of imports and the consequent loss of actual or potential domestic employment in the sector concerned. In fact, local content requirements have existed for many years in the United States, for example in government-subsidized purchases of buses, railroad logging stock and, until recently, ships ([72], pp. 7-8). An explicit local content requirement has existed since 1965 under the United States-Canadian Automotive Products Trade Agreement Act of 1965, which allows the duty-free flow of automobiles between the United States and Canada, but also contains a content provision under which automotive products entering Canada from the United States must have not more than 50 per cent foreign content in order to qualify for duty-free status ([72], pp. 8-9). Another law that relates to local content is the 1980 amendment to title V of the Motor Vehicle Information and Cost Saving Act, "Improving Automotive Efficiency", which allows foreign automobile manufacturers who establish assembly facilities in the United States to count their United States production as part of their requirements relating to the corporate average fuel economy ([72], p. 8).

The record trade deficit and the high unemployment rate in the United States have recently prompted several protectionist proposals. One of the proposals is House Resolution 5133, a bill to establish "The Fair Practices in Automotive Products Act", commonly referred to as the domestic content bill, which was primarily designed to force Japanese industries to use United States parts in cars to be sold in the United States. This content bill passed the House of Representatives twice during 1982-1983, but was never taken up in the Senate (and therefore never became law). The discussion generated around the bill is nevertheless relevant to an analysis of local content policies in developing countries.

The foremost argument for such legislation has been that it would create or preserve jobs in the United States automobile and supplier industries by increasing demand for their products and reducing foreign competition. The focus of the arguments presented, then, have been basically static ones, rather than the more dynamic and long-term factors and strategic considerations that have been presented above for developing countries. In addition, the presentation was similar to that used in describing the effect of tariffs.*

Imposing local content on (foreign) automobile producers in the United States would mean that the lowest-cost sourcing could no longer be fully exploited, and automobile prices would rise. Such a price rise would lead to a reduction in domestic car consumption, and create a welfare loss for consumers. Those who would gain at the expense of the economic interest of the entire community would be the producers of import substitutes, whose previously over-priced products would have been made more "competitive" due to the policy measures (that is, local content regulations) imposed on the lowest-cost producer.

It follows, however, that cuts in demand due to an increase in price could offset some of the gains in employment generated by the high-cost sourcing imposed on manufacturers that sell cars in the United States. Since imports still would remain on the market, and consumers would continue to demand competitive prices for cars, United States firms would face pressures to reduce costs. One way of doing this would be to substitute capital for labour, thus leading to a further reduction of the domestic labour force in the United States automobile industry. Such substitution is currently being pursued, often in a very vigorous way, as in the case of the new General Motors Saturn, and this underscores the special-interest nature of the proposals in the United States.

The arguments in favour of local content legislation presented by the United Auto Workers rest on the assumption that it is increasing competitive imports that cause the problems in the United States automobile and supplier industry [76]. Like any other trade

*See Munk [3] and also Wonnacott and Wonnacott [73], Johnson [74], Corden [75] and Grossman [1].

restriction, however, local content requirements impose the greatest burden on customers in the home country, since they must pay the higher domestic price for the good (both imported and domestically produced). In the case of local content legislation, consumers pay twice for it, once in the form of higher domestic prices and again in the form of the potential benefits from foregone government revenues if tariffs had been used instead of local content requirements. Local content legislation would also redistribute income within the economy, but it would be done in a hidden way. Estimates suggest that the annual cost to consumers per automobile worker re-employed range from \$245,000 to \$1,125,000 [77], this cost to consumers including the revenue transferred to the domestic economy. Open redistribution of this amount of money through lump-sum subsidies to car manufacturers would be highly controversial, but redistribution through a local content requirement is hidden redistribution.

The gains from trade through specialization and exchange will not be realized if local content regulations are adopted as long as Japanese industries have a comparative advantage in the production of automobiles relative to the United States. The overall impact of local content legislation on the United States economy would seem to be reduced efficiency in the United States and counter-measures by United States trading partners which would result in a lower demand for United States exports and a decrease in overall United States economic activity and employment ([26], p. 61).

As part of the local content discussion in the United States, the Congressional Research Service considered alternatives to local content, including measures to increase competitiveness in industry in general, to reduce the enforcement of anti-trust legislation to allow more integration (and supposedly increased efficiency) in the automobile industry, to promote automobile exports, to increase access of United States firms to the "after-market" in accessories and repairs of imported cars, and to attempt to decrease local content requirements in other countries (to allow United States firms greater ease in locating abroad) [72]. Just as the discussion of the costs and benefits of local content policies was carried out with reference to the effect on employment in an existing automobile and components industry, so are these proposals specific to an industrialized free market economy. Unfortunately, little in the United States debate appears of relevance to developing countries in their attempts to formulate and evaluate local content policies as a component of their industrial strategy.

D. Conclusions on the use of local content policies to promote industrial development in developing countries

Any policy to stimulate investment in the local economy of a developing country depends on a certain degree of health of the economy and political stability in the country, and is made easier by the presence of basic resources and inputs as well as of a suitable market. All of these factors can in turn be influenced both directly and indirectly by an appropriate set of government policies - which could include local content - with regard both to specific production and input sectors and to incentive policies.

In the absence of such preconditions and of the appropriate complementary measures, policies designed to increase the degree of localization of the economy cannot attain their full effectiveness. At the same time, even in their presence, the objectives of poorly conceived policies such as those relating to local content may be unachievable (because, for example, the required local capacity is not available), or, even if achieved, may be of limited impact (because, for example, the local content provision is met through buying in industrially unimportant products, or because it was achieved at a very high cost in subsidization or tax credits). Local content protection can also fail to achieve the desired protectionist objectives motivating the policy because the degree of protection imposed is variable and difficult to predict,* and because the timetables are often only weakly monitored and severe penalties are often not imposed for failing to adhere to them.

The effectiveness of local content policies is also difficult to determine when there are problems of measuring the precise degree of local content or of verification of its attainment. But this question has been deemed to lie outside the framework of this study, as has the practice of transnational corporations of sometimes agreeing to comply with local content regulations, while having no intention of doing so in anything but the formal sense. Further, in some future, more comprehensive examination of industrialization strategies and policies for developing countries, attention should be devoted to evaluating alternative methods of attaining the objectives which local content regulations are designed to achieve. Alternative policies certainly exist to deal with employment generation, fostering of entrepreneurship, development and application of technology, infant industry protection, the domination of transnational corporations and foreign exchange problems, and the relative effectiveness of policies on local content in each area must be critically examined. Only when more extensive studies of local content as a long-term industrialization policy have been carried out will it be possible properly to assess the appropriate role of local content in the long-term industrialization and development of developing countries.

But those sectors where local content regulations have traditionally been applied, which includes the majority of the sectors of the capital goods industry, represent important industrial sectors in the industrialized market economies which are large employers, account for a large share of foreign trade, play a central role in the development and diffusion of management techniques and practices and are an important engine of growth. For developing countries today they represent modern industrial sectors, with all the positive things that implies, are a rapidly growing component of consumer and industrial demand, employers of skilled labour, and potential sources of savings on imports and earnings for exports, and represent a tool for investment policy planners and an important source of growth.

*On this last point see Baldwin ([78], p. 608).

These sectors also have a number of intrinsic features in common, including the requirement of a long planning period for developing the industry, a long gestation period for the human and physical capital utilized in the industry, important economics of scale, crucial linkages with existing small-scale industry, as well as with other government policies in areas such as technology, entrepreneurship and skill development, close ties with the entire supplier chain (materials, components and capital equipment), and a global industrial structure dominated by transnational corporations. All of these features help to create very policy- and strategy-intensive industries. They also all represent reasons why national governments have a direct interest in the performance of these industries, and why local content policies have often been applied in them.

It is fully understandable that many developing countries feel that it would be of enormous benefit to them to import equipment for the capital goods sector, even when the equipment is not optimally factor-biased. But it has been argued in this study that if new techniques are regularly transferred en bloc from developed countries, this drastically reduces the possibilities for a learning process in the design and production of capital goods to take place. As Rosenberg ([79], p. 166) argued, "reliance on borrowed technology perpetuates a posture of dependency and passivity. It deprives a country of the development of precisely those skills which are needed if she is to design and construct capital goods that are properly adapted to her own needs".

These appropriate skills are best - or perhaps can only be - acquired through an intimate association between the user and the producer of capital goods. This is particularly true when one realizes that the process of technological change, which is generally seen as the most important source of economic growth, is not just a series of major scientific breakthroughs, but also, and perhaps more importantly, "a continuous stream of innumerable minor adjustments, modifications, and adaptations by skilled personnel, and the technical vitality of an economy employing a machine technology is critically affected by its capacity to make these adaptations" ([79], p. 166). And these are skills that cannot be purchased in bulk, but which must be home-grown in the native environment.

The discussion of local content policies in individual developing countries has illustrated the importance of local content today in the developing world. And while tables 2 and 3 made it clear that this has been primarily a policy instrument of the more industrialized of the developing countries, the use of local content regulations is growing - both in terms of the number of countries introducing them and in the number of sectors where they are applied. As the Wall Street Journal [80] puts it: "There is little chance that companies trying to do business in the developing world will escape this rising tide of local content demands".

Some of the countries studied can demonstrate clear benefits from their policies, but for many there was a failure to develop a

national production structure, to foster exports, and to give appropriate attention to commercial vehicle production where the minimum efficient scale is much lower than for automobiles - this was the case in Japan, where the development of productivity engineering techniques in passenger car production was based on developments in commercial vehicle production [51]. These are all critical areas where the automobile industry has often gone wrong, and where macro-economic, industrial, and foreign trade policies need to be co-ordinated with local content policies. The problems may be traced to the location in industrial market economies, where the reference space is the larger global situation, of key decisions on the automobile industry in developing countries, where the individual developing country is just one parameter.

While the analyses quoted in the earlier review of local content policies included reservations on some of those policies, the simple fact of their growth and application by developing countries attests to a certain measure of perceived success for the simple reason that rational government planners would not support the implementation of a policy which was a proven failure in other countries. The initiative in establishing relationships with developing countries has been taken by a growing number of foreign companies that satisfy local content requirements by methods such as the following: self-contained direct investment; designating a country, regional or world-wide export base for certain products or parts; countertrade; and making investments unrelated to their business but that support national objectives. This is at least in part because "the increase in the number of international competitors fighting for the same markets has diminished substantially the ability of companies to resist local content pressure" [80].

In reviewing the development of local content policies it is also important to draw lessons that will aid policy-makers in evaluating the wisdom of such policies for the future of developing countries, taking into account the pattern of current developments in competition, in automation of information flows, in industrial supply policy, and in macro-economic change in developing countries themselves.

First, in the automotive industry, the capital goods sector where local content policy is most prevalent, the components industry is shrinking and becoming progressively more dominated by transnational corporations from industrial market economies. At the same time, the share of components imported into the markets of industrial market economies is expected to grow [81], but much of this growth could very well be in-house production by foreign corporations abroad, rather than real domestic production - a distinction that much of contemporary local content legislation fails to make.

Secondly, not only in automobiles, but also in other sectors such as aircraft, the suppliers industry is being transformed by the development of unified automation systems which contain communications rules by which all suppliers must work and which enable the computerized systems in the production plant as well as

in all supplier plants to understand each other and work together under unified control. The specifications developed by General Motors (known as the manufacturing automation protocol), for example, appeared less than two years ago, but has already been accepted by hundreds of suppliers in Canada, Australia, Japan, the United Kingdom, the United States and other countries of western Europe [82].

Thirdly, the major automobile producers are moving away from short-term supply arrangements to multi-year contracts, a policy which means that, in the words of one United States automobile consultant, "the relationships formed now will last through the turn of the century" (Macosko, quoted in [81], p. 88). Combined with the development of automated factory supply systems, it is clearly going to be extremely difficult for new suppliers in developing countries to break into the market in the future.

Fourthly, the rate of change in materials used in producing automobiles and automobile components, in ceramics, plastics, aluminium and new steels, is extremely rapid and will impose very large demands on any developing country that attempts to compete internationally. Indeed, these forces are already causing serious problems in established components and automobile producers in developed countries (for example, Smith [83]). The companies and countries that are successful will have to invest highly in research and development, capital equipment and people, and only then can local content policies have a change of success.

Finally, there is the simple fact that per capita income, and hence demand, in developing countries themselves is currently growing more slowly than in the past, and therefore the short- and medium-term demand prospects for the sector have diminished. To this must be added that with the fall in growth rates has come a fall in investment, and hence in the injection of new technology into the industry in developing countries, which certainly reduces the ability of assemblers and component producers to compete in the medium term. Taken together, these two factors must reduce the relative priority previously accorded to the sector in many countries.

The fundamental changes taking place therefore seem to imply that the successes achieved by selected developing countries using local content in the automobile sector and in other sectors of the capital goods industry will not be easily repeated in the future.

At the same time, the sheer scale of the investment programme of the automotive transnational corporations means that developing countries must rely on the transnationals if they are to play a role in the automobile industry. And one of the only hopes for their participation is through some type of local content programme, since very few developing countries are in a position even to attempt to develop their own independent automobile industry. Government awareness of this fact in developing countries is one reason why Governments have taken a close interest in the evolution of the automotive industry from the start.

At the same time, the transnational corporations have been devoting more attention to exploiting local government incentives to the maximum, as part of attempts to minimize costs. This has been complemented by increased interest by the transnationals in the possibility for greater outsourcing in developing countries. These points suggest areas of a possible congruence of interests between the transnationals and developing countries.

The cost to the developing country of these incentives can be very high, including the revenue lost from such measures as the exemption of new cars assembled under local content regulations from duties on imported parts, the duty-free import of machinery and equipment, bans on the import of (taxed) finished products, and exemptions from income taxes and property taxes. In addition, there is the real cost of assistance from special development funds, investment promotion activities, export tax rebates, low-interest loans etc., as well as from preferential prices for raw materials.

There is also a growing risk of trade barriers in the North prohibiting many of the imports from the South, a circumstance that could replace the potential congruence of interests with a possible conflict of interests between developed and developing countries. But to the extent that the major investors are transnational corporations, they can be counted on to lobby for outsourcing. Developing countries also stand to benefit from the attempt by the transnationals to diversify their sources of production, with, for instance, Japanese corporations co-operating in automobile production (through partial ownership) in developing countries, the finished product then being shipped to markets where wholly Japanese products would be at a competitive disadvantage.

It has also been argued in this study that the full potential impact of local content policies on the national development effort has often failed to materialize, particularly because the linkages to technology, entrepreneurship and skills were too weakly developed, and also because of the insufficient linkages either to the existing industrial structure - defined to include factors such as basic repair and maintenance facilities (and small-scale enterprises in general) upon which the localization programme could build - or to the desired competitive industrial structure. The policies were also often very costly, both in the sense of driving up local prices and of misallocating scarce resources.

The various case-studies have partially identified some of the factors which explain why local integration has been judged successful in some cases, and deficient in others. One conclusion that emerges is that a high level of local content may be consistent with efficient production. The conventional view that the problem derives from the small absolute market size is not relevant for the larger developing countries. But even for the majority of small and medium-sized developing countries, the problem of size can be overcome through co-operation among developing countries.

A recurring criticism in this study of existing local content policies is that they have been designed in isolation from other key

policy and strategic considerations that are integral to the national development effort. Moreover, local content policies in individual countries are, with a few notable exceptions, almost exclusively designed from a purely national perspective. At the same time, it is well known that the potential for the development of the capital goods industry within developing countries through trade in manufactured goods is considerable, an observation that is underscored by the fact that roughly half of the exports of capital goods by developing countries are currently destined for other developing countries [5].

The logical extension of this argument would be that, in the course of implementing their local content policies, developing countries with relatively less experience in the assembly and production of components could avail themselves, through licensing and other agreements, of the co-operation of more experienced firms based in selected developing countries. This could follow the lines generally suggested for co-operation among developing countries in the transfer of technology for capital goods production, making use of the experience of firms in developing countries in negotiating licensing agreements with, and local content regulations applicable to, suppliers from developed countries, taking advantage of the skills (including entrepreneurship) available in developing countries for training schemes, and encouraging the exchange of technical information.*

Looking specifically at automobiles, one of the leading scenarios for the United States automobile industry is that, as a natural consequence of maturity, the local content of United States car sales will decline, one estimate [41] suggesting that as much as 65 per cent of all cars sold in the United States would be produced in foreign countries. Much of these imports would be inputs - components of non-North-American origin - into the over 1 million Japanese cars that it is estimated [49] will be produced in the United States by 1990, but others would be imported from developing countries - primarily Mexico and Brazil - by United States producers, and cheap cars imported from countries or areas like the Province of Taiwan, the Republic of Korea and Yugoslavia. It can be expected that the present focus on Japanese imports into the United States will be replaced by a focus on Japanese production inside the United States.

It is difficult to imagine that this will not lead to calls for increased protectionism - and national local content regulations - in the United States. And with their relatively greater unemployment problem and excess capacity of 2.3-2.5 million units in the automobile industry, Western European Governments can only be expected also to increase their already strong pressure on foreign producers for local sourcing. This pressure would be increased if the excess capacity created in the United States market

*See UNCTAD [15] for a similar discussion related to the capital goods industry.

were then to generate increased exports to Western Europe of United States-built Japanese cars, as well as more Japanese production in Western Europe. Nevertheless, it is to be expected that there will be a market for selected developing countries here, and therefore for local content legislation directed to the production of automotive components as a component of development strategy in developing countries. But the market will most probably be dominated by developing countries that are already established in the components sector, these producers also perhaps having production agreements with Japanese industries or producers from other developed countries.

On the other hand, an alternative scenario for the automobile industry in the North would involve United States firms moving to concentrate on more performance-oriented competition and the more expensive end of the market. This would, in turn, prove very beneficial to producers of cheap cars such as the Province of Taiwan and the Republic of Korea. In this strategy also there would be a key role for developing countries, but again most probably those already established in the industry.

This study has argued that, in developing their automotive industry, like their capital goods industry in general, developing countries should think largely in terms of their own market, that is, the southern market. For it is here, and not in the North, that future growth can be expected. Thus, to quote the forecasts of Altschuler and others [84], demand in developing countries is expected to grow from 3.4 million units in 1980 to 5.2 million in 1990 and to 11.5 million by the year 2000. But it must be noted that they may increasingly find themselves facing competition from joint United States-Japanese or Western European-Japanese production specifically designed for developing countries.

This would lead to recommendations for the development both of export policies oriented to the southern market and, particularly for the majority of developing countries where the domestic market is too small to allow the realization of economies of scale, of a policy of southern content. Under such a policy, with variations for regional groupings, a requirement would be made that a certain percentage of the product came from the South or from the regional grouping. And the countries that so benefited would then show a preference for the import of the finished products into their home market. Like well-conceived local content policies, such a policy could have a significant impact on the level and structure of industrial production, and become a basic policy for restructuring industry.

An example of the spirit of this proposal would be the automotive industry programme adopted by the Andean Pact countries in 1977. Since the group represents a market for cars which is expected to exceed 600,000 by 1988, it is a ready-made market, but for subregional, rather than national, policy-making. Under the automotive industry programme member countries are obliged to produce or use components of national manufacture, those components

which are commonly used in great amount having been allotted to specific member countries for specialization. After fulfilling its national local content requirement, a producer in a member country can manufacture components for use in vehicles assigned to other member countries. If that component is produced efficiently, the Board of the Andean Pact (which functions as the secretariat of the Pact) can allocate to it a subregional status which entitles it to preferential treatment in relation to products imported from third countries.*

Another important point is that a major problem of the automobile industry in many developing countries arises not so much from their inward-looking strategy, but rather from the liberal open-door policies towards transnational corporations. This has meant that the firms which gained handsomely from the local integration strategy were the international firms and not indigenous producers or consumers. Rationalization is clearly difficult to implement for reasons related to political economy rather than economics per se; once a large number of transnational corporations have invested in the country and productive facilities have been set up, the manoeuvring room of the host Government to regulate and control these firms is seriously limited. For developing countries with a local content policy that has not gone very far, however, the possibilities of rationalization do exist. But, where rationalization is directed at reducing the number of firms, it must be complemented by measures to ensure that the limited number of producers actually yield spin-offs for the domestic economy.

The history of local content also suggests that a selective approach to local integration and a concentrated effort at developing specific industries in which the country may possess a long-

*In cases where national or subregional producers cannot meet the required local content level, the Board can authorize a higher import content. At the same time, to protect against "over-protection", the Board from time to time assesses the levels of protection in accordance with the movement of national and international prices for similar products. Local content is also interpreted in a subregional sense, in that provision is made for co-production in agreements entered into between two or more countries sharing the assignment of the same vehicle, as well as in joint agreements for the production of parts and components required in both countries, the objective of the agreements being that member countries could specialize in the production of certain parts and components, and thereby more easily attain the required "critical mass". Finally, the automotive industry programme also contains provisions for the subregional exchange of information covering new foreign investment commitments, the development of new technology in the automotive industry, product specifications and certification of quality. All of these measures are complementary to the objectives of local content regulations and in the long run would help to strengthen the technical and economic base of the automotive industry in the subregion.

term competitive advantage is more likely to succeed than an across-the-board, non-discriminating strategy. In this respect, it must be understood that a local content policy is not necessarily a "quick" nor a "clean" solution to development problems, but rather that it is a policy to be used as a component of a long-term, sector-wide plan. In addition, it requires caution in its implementation to ensure that it does not become a "dirty" solution, in the sense that local content requirements become an institutionalized method for "backing losers" in the form of perennially inefficient firms and subsectors.

It has been emphasized throughout this study that a basic principle in rational policy-making in the industrial field is that any policy such as local content regulations must be integrated, both in its conception and in its implementation, with government policies in other fields, and most particularly with those concerned with carrying out the technological transformation of the country, fostering and developing its entrepreneurship capacity, and increasing and diffusing labour skills within the economy, as well as with other policies simultaneously being applied at the micro-level in the same sectors and firms. This is one of the areas of minimum involvement generally agreed upon as appropriate for the operation of government policy and planning activities in developing countries today.

For example, a policy of local content in the assembly and manufacture of components must be combined with a policy to reduce the number of domestically produced makes and models of the products concerned, in order to allow the domestic producers to attain, or at least to approach more closely, the minimum efficient scale of operation. Or, also in the area of scale economies, greater priority in the field of vehicle assembly and components production operations should be attached to commercial vehicles than passenger cars in view of the smaller scale economies associated with the former.

Further, in the formulation and implementation of government policy towards transnational corporations, appropriate attention should be devoted to the elaboration of a carefully designed local content policy as an integral component of government policy in this field. Such policies should include detailed measures to promote the involvement of domestic producers in design work for the products assembled and produced; should increase the specialization of domestic producers within the entire range of products being produced and assembled; and should be based upon the priorities established at the national, macro-economic level for the creation of technological linkages, the fostering and development of entrepreneurship, and the enhancement of labour skills.

These principles can serve as general guidelines for the design and implementation of local content policies both for countries which are engaged in assembly operations and for those which have progressed to the actual production of more complex components. Such a policy should also ease the process of transition to the production of capital goods for developing countries not engaged in

such production at present. In each case, however, a recent UNCTAD [15] study on the capital goods industry argues that current ad hoc policies need to be transformed into a well-articulated plan, not just for the specific branch in question but also for the capital goods industry as a whole, for other key spheres of the economy (such as technology, entrepreneurship and labour skills) and for the entire national economy.

Where the industrial capacity is underdeveloped, local integration policy must be adopted in conjunction with policies to strengthen domestic firms and suppliers. Such policies may encompass managerial training, skill enhancement encouragement of mergers, an active search for technical assistance to ensure the transfer of know-how, and assistance and various incentives to local firms to alleviate constraints (where appropriate). The issue of technology transfer is particularly critical in view of the general failure to relate policies on local content to those on technology. Certainly in the automobile industry, despite some technological learning, the core technologies must in many cases still be obtained.

In this regard, one primary objective of government policy in a developing country must be to stimulate a steady graduation of the country through the stages of learning-by-doing, in terms of the implementation, adaptation, assimilation and improvement of imported technology. Such learning can apply to many subsectors of the capital goods industry where production involves a large number of parts and components (for example, electrical appliances, agricultural machinery and motor vehicles), and includes simple learning by doing, learning by adapting, learning by improving design, learning by setting up complete production systems and learning by innovation. It requires a policy of technological unpackaging for its successful implementation and can be fostered by a set of appropriately differentiated local content policies.

As far as local content policy itself is concerned, it is desirable to specify not only the particular items to be sub-contracted, but also the division of labour between the assembly or terminal industry and the suppliers industry. Further, as far as possible, the suppliers industry should be reserved for indigenous producers. To the extent that the assembly or terminal industry is dominated by foreign affiliates, policy should be directed towards maximizing the linkages between the former and the domestic suppliers. In all of this, consideration must be given to the balance of long-term competitive advantages between foreign and local, large and small firms. This approach is more likely to lead to a widespread diffusion of learning without placing an excessive burden on the local industry. In addition, standardization of components to ensure scale economies is obviously an important policy issue that has to be tackled. These comments apply not only to the automobile industry, but also to other sectors if local integration is to be implemented.

The setting of the numerical targets is also a very critical point. On the one hand, local content requirements have in many

cases not been fulfilled and have been relaxed precisely because of the difficulties of the companies in meeting the supposedly over-optimistic targets. At the same time, target-setting in local content regulations is a perfect place for the Government to apply the doctrine of "taut planning", under which targets are purposely set above the level that existing resources would suggest is possible in order to extract hidden or unknown resources, including new technological ideas or better management practices, which otherwise would not have been forthcoming. At the same time, wise policy-making would interpret local content targets flexibly in light of the trade-off between the level of local content and the level of costs, rather than pursue the maximum level of local content as an end in itself.

In the case-studies of local content it was also possible to discern some current trends regarding local content in developing countries as a result of the balance of payments and debt crises, which are leading many developing countries to strengthen their local integration strategy and to place greater emphasis on export promotion and import restraint. In particular, large subsidies are often required to support export promotion. A local content policy may, however, conflict with other policies designed to advance indigenous capability, in so far as the former requires a closer integration of the local industry with the global operations of foreign firms (the activities of which may be strongly discouraged by the policies adopted). An ill-conceived export promotion strategy is therefore not unlike badly formulated import substitution policies, in that both lead to excessive costs and uncertain benefits.

For the automobile industry, and by extension for much of the capital goods industry, it is clear that what happens in the South-East Asian and Latin American developing countries, will in future be decided, to a far greater extent than in the past, by the dominant forces in the industry world-wide, and that the attention paid to certain developing countries by the automotive transnational corporations will be very much a function of the changing patterns of the international situation. In this context, it may be a "serious distortion of reality" [4] to talk of industrial policy in these sectors as a matter for individual developing countries.

More generally, the future prospects for the industry in the majority of developing countries has been fundamentally shaped by the response in the industrial market economies, and especially the United States, to the crisis and economic dislocation of the 1970s. Their strategy was designed to extend the mass-production model globally by linking production facilities and markets of the industrial market economies with the most industrialized developing countries. This in turn represents another example of the phenomenon analyzed by Piore and Sabel [85], where transnational corporations operate to stabilize markets in a world where the forms of co-operation among countries can no longer do the job.

The result of these developments is that there remains a real role in the global industry for only a handful of developing countries or areas, including in particular Brazil, Mexico, the Province

of Taiwan, the Republic of Korea and perhaps Argentina. This outcome is reinforced by the growth of transnational corporations in the components as well as the assembly industry, the dominance of which is growing very rapidly, and by allied factors such as the advent of requirements by major automobile producers for component suppliers to be connected to their automated data communications system. In addition, rather than disrupting this new order, Japan in the 1980s is being smoothly absorbed into the new global system.

Despite the lack of a significant recovery in the industrial market economies in general, in the capital goods industry a major programme of investment in automation, robotics and computer-aided design is currently under way and is drastically reducing the labour content of output, a trend that threatens to leave behind all northern producers who do not do likewise. This risk is clearly much greater for developing countries. The pace of technological acceleration and robotization is so rapid both in terms of products and of production processes that in developed countries today many capital goods sectors, as Garel Rhys argues, can almost be regarded as new infant industries rather than ones entering the final stages of maturity.*

There are at least three major implications for developing countries in these trends. The first is that pressures will remain at a high level in industrial market economies for protectionist measures to counteract the threatened losses of employment due to the technological revolution. The second is that, in consequence of these pressures, it may not be politically acceptable for Governments in developed countries to allow imports from lower-cost developing countries or areas such as the Province of Taiwan, the Republic of Korea or Yugoslavia, because it could imply further plant closures in the North. And, perhaps most importantly, with this total revolution in production technologies in the North, the countries of the South, with only a few exceptions, may run the risk of being caught in "the wrong technological revolution".**

A more positive conclusion of this study would, however, be that local content policies, provided they are based on careful analysis of the costs and benefits and are carefully monitored, represent a rational policy option for developing countries to consider for specific sectors of the capital goods industry (including the automobile sector), not least because of the considerable positive linkages in the areas of technology, entrepreneurship, labour skills and indigenous industrialization which well-designed policies can bring. They also represent a policy alternative for fostering - through technology unpackaging, standardization and local manufacture - industrial development and co-operation among

*Rhys, quoted in Painton [86], speaks only in terms of the automobile industry, but there appear to be solid grounds for extending this to many subsectors of the capital goods industry as well.

**This danger is examined in UNIDO [87].

developing countries, building on and expanding the existing industrial capacity of enterprises in even the smaller countries.

Local content regulations must also be seen to represent one policy element of a long-term strategy to develop an industrial structure that is complementary to the industrial structure of industrial market economies. By continuing to produce in the traditional industries such as textiles, developing countries, while appearing to follow the dictates of international comparative advantage and to industrialize in a way that would harmonize with development in industrialized market economies, are putting themselves in a de facto position of competing directly with residual northern producers. These, often being situated geographically in the old industrial areas, are precisely those industries that are not profiting from the newest impulses to industrialization in developed countries. This produces a North-South conflict situation that leads to the introduction of protectionist barriers by developed countries and constrains the potential impulses to global development generated by expanding international trade.

On the other hand, rather than competing for shares of a static market as in the case of textiles, developing countries could strive to become one of the elements in an international production network in harmony with the more modern and advanced sectors in developed countries, thereby helping to create a complementarity of industrial production within the framework of the intra-firm (or intra-transnational-corporation) and intra-sector trade that grows in direct relationship with increases in demand for the output of northern industries. An example of complementarity would be the production in developing countries of components for automobiles produced in developed countries, the demand for the imported components increasing hand-in-hand with the demand for the (at least partially exported) assembled automobiles, thus resulting in offsetting import and export flows rather than import flows in direct competition with goods produced primarily for domestic consumption.

Such a long-term development strategy requires, however, conscious government policy to develop the appropriate industrial sectors, one of the possible policy alternatives being local content regulations to establish industries to participate in the growing volume of intra-firm and intra-sector trade. An assessment of the benefits of local content regulations must therefore be based not only on an analysis of infant industry and import substitution strategies, but also on the broader consideration that they enable developing countries to deploy a strategy that is more forward-looking and more consistent with flourishing North-South trade flows than the old inter-firm and inter-sector strategy recommended to them in the past.

In the final analysis, a properly conceived policy on local content can be employed to foster the development of indigenous capital goods and electronics industries, and hence make a critical contribution to the success of an independent industrial policy. It may also generate positive spin-offs for the national economy,

particularly in the technology, entrepreneurship and skill areas, externalities which are often as important as, if not more so than, the direct benefits of the policy. It must be flexible, industry-specific and part of an innovative set of policy instruments. If ill-conceived, it may simply contribute to the inefficient production of simple products which make no positive contribution to the overall development effort and reduce the efficiency of the allocation of resources generally. As in many other areas of the formulation of policies and strategy for industrial development, there is no a priori answer as to the efficiency of local content regulations; it is rather a question of wise design, implementation, monitoring and evaluation.

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Introduction

The purpose of the present article is to provide the latest available data on the world industrial situation in relation to the recommendations of the Lima Declaration and Plan of Action on Industrial Development and Co-operation, the New Delhi Declaration and Plan of Action on Industrialization of Developing Countries and International Co-operation for their Industrial Development, and the International Development Strategy for the Third United Nations Development Decade.

The data provide information on the growth and composition of industrial production and trade. The first section refers to each of the major economic groupings, to developing regions and to income groups, while the second section concerns the least developed countries. The statistics were derived from the UNIDO data base, which was developed by the Statistics and Survey Unit of the Division for Industrial Studies and is maintained and updated by that Unit. Primary sources of information are data compiled by national statistical offices, the Statistical Office and the Office of Development Research and Policy Analysis of the United Nations Secretariat, the regional commissions, the World Bank, the International Monetary Fund and the Organization for Economic Co-operation and Development.

Because the basic data may reflect different statistical and accounting practices in reporting countries, the statistical programme of the Statistics and Survey Unit is focused on making adjustments in the data to ensure a greater degree of international comparability. The Unit prepares estimates for the latest years available. The recency of the statistics varies, however, according to the amount of detail required and the type of data being considered. The reader should note that several producers of the international statistics used here may revise country data for several preceding years at the same time that they update their statistical series. Thus, the figures are based on the latest available data for the entire period shown and may differ slightly from the corresponding estimates published in earlier years. Finally, where figures are stated in constant prices, the calculations were carried out from data expressed in United States dollars at 1975 prices. All growth rates are calculated from information for each year throughout the period indicated, using a semi-log regression over time.

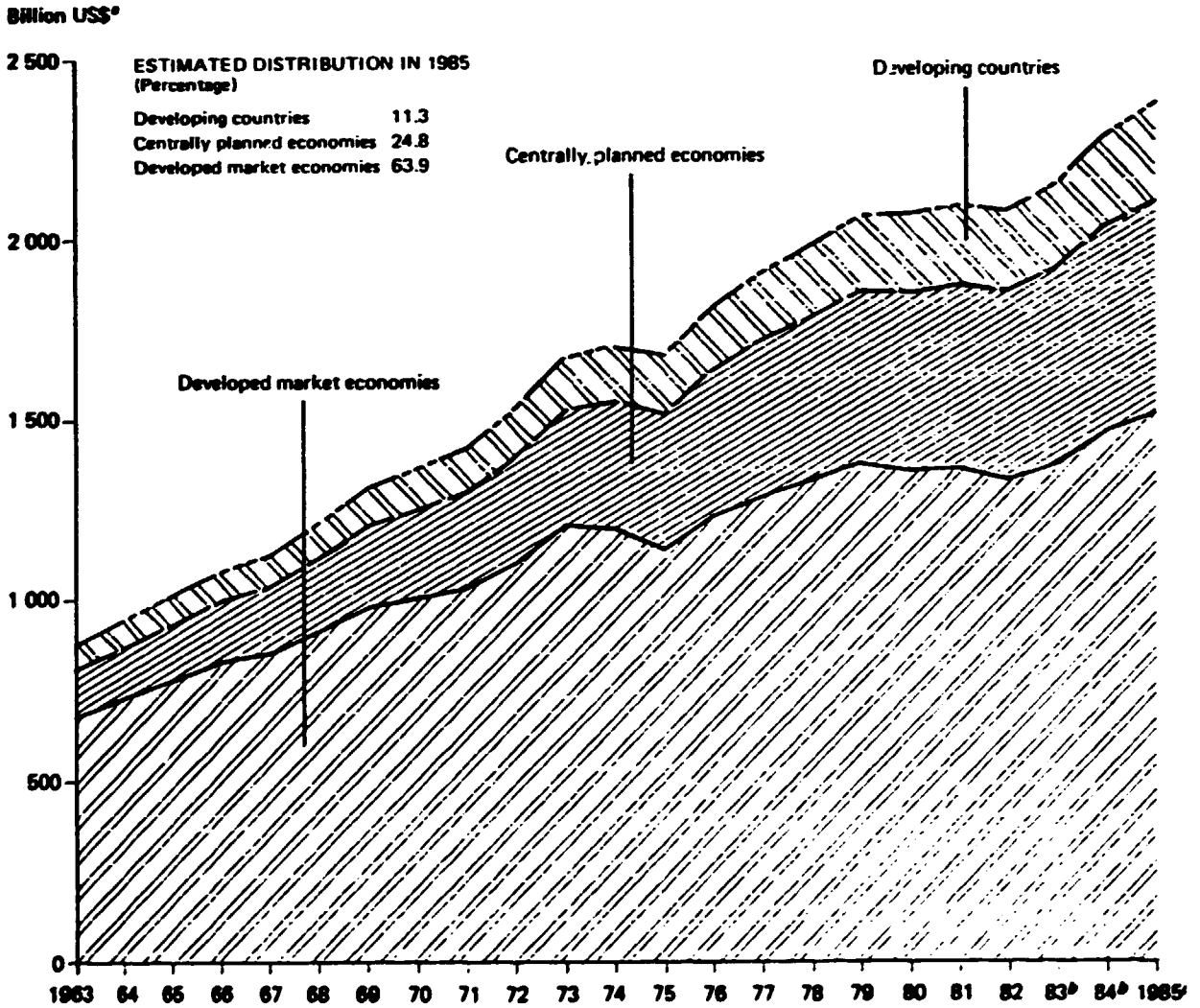
*Originally issued as UNIDO/IS.590.

The following classification of economic groupings is used in the text and in most tables in conformity with the classification adopted by the Statistical Office of the United Nations Secretariat: "Developing countries" includes the Caribbean area, Central and South America, Africa (other than South Africa), West Asia (other than Israel) and South and East Asia (other than Japan). "Developed market economies" includes North America (Canada and the United States of America), Europe (other than Eastern Europe), Australia, Israel, Japan, New Zealand and South Africa. "Centrally planned economies" includes Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary, Poland, Romania and the Union of Soviet Socialist Republics. Unless otherwise specified, "world" excludes Albania, China, the Democratic People's Republic of Korea, Mongolia and Viet Nam.

Inclusion of a particular country or area in, or its exclusion from, any economic or geographical grouping has been dictated by considerations of the availability of comparable data in statistics of the United Nations and other international agencies.

STATISTICAL DATA ON GROWTH AND COMPOSITION OF INDUSTRIAL
PRODUCTION AND TRADE, BY ECONOMIC GROUPINGS, BY
DEVELOPING REGIONS AND BY INCOME GROUPS

Figure 1. Manufacturing value added, by economic grouping, at constant (1975) prices, 1963-1985



Source: UNIDO data base; information supplied by the Office of Development Research and Policy Analysis and the Statistical Office of the United Nations Secretariat and the Economic Commission for Europe, with estimates by the UNIDO Secretariat.

^aOne billion = 1,000,000,000.

^bPreliminary figures.

^cEstimates.

Table 1. Distribution of world manufacturing value added, by economic grouping,^a at constant (1975) prices, 1980-1983

(Percentage)

<i>Economic grouping</i>	1980	1981	1982	1983 ^b
Developing countries	10.27	10.21	10.34	10.29
Centrally planned economies	22.92	23.25	24.00	24.18
Developed market economies	63.08	62.70	61.51	61.11
China ^c	3.73	3.84	4.15	4.42
World	100.00	100.00	100.00	100.00

Source: UNIDO data base, information supplied by the Office of Development Research and Policy Analysis and the Statistical Office of the United Nations Secretariat, with estimates by the UNIDO Secretariat.

^aIncluding China.

^bPreliminary figures.

^cCalculations based on the *Statistical Yearbook of China, 1984* and on unpublished information.

Table 2. Share of developing regions^a in world manufacturing value added, at constant (1975) prices, 1963-1985

(Percentage)

<i>Year</i>	<i>Africa</i>	<i>West Asia</i>	<i>South and East Asia</i>	<i>Latin America</i>
1963	0.78	0.47	2.13	4.44
1964	0.79	0.48	2.10	4.55
1965	0.80	0.49	2.08	4.47
1966	0.79	0.51	1.99	4.51
1967	0.76	0.53	2.04	4.50
1968	0.78	0.55	2.05	4.56
1969	0.79	0.56	2.09	4.58
1970	0.84	0.57	2.14	4.81
1971	0.86	0.59	2.19	4.96
1972	0.83	0.59	2.21	5.05
1973	0.83	0.60	2.24	5.08
1974	0.83	0.61	2.34	5.26
1975	0.87	0.67	2.54	5.49
1976	0.86	0.68	2.64	5.49
1977	0.87	0.69	2.75	5.44
1978	0.90	0.72	2.90	5.48
1979	0.93	0.71	2.92	5.64
1980	0.99	0.70	3.05	5.92
1981	1.01	0.70	3.20	5.71
1982	1.04	0.77	3.32	5.66
1983 ^b	1.01		4.35	5.30
1984 ^b	0.99		4.58	5.24
1985 ^c	1.00		4.79	5.28

Source: UNIDO data base, information supplied by the Office of Development Research and Policy Analysis and the Statistical Office of the United Nations Secretariat, the Economic Commission for Africa and the Economic Commission for Europe, with estimates by the UNIDO Secretariat.

^aExcluding China.

^bPreliminary figures.

^cEstimates. Regional percentages do not add up to the share of all developing countries in world manufacturing value added shown in figure 1, because of gaps in the coverage of developing countries.

Table 3. Growth of manufacturing value added per capita, by economic grouping and by developing region, at constant (1975) prices, 1963-1985

(Percentage)

Year	All developing countries	Least developed countries	Centrally planned economies	Developed market economies	Developing regions			
					Africa	West Asia	South and East Asia	Latin America
<i>Increase or decrease over previous year</i>								
1964	6.7	4.4	4.3	7.1	6.7	6.6	3.8	7.7
1965	3.7	6.5	10.0	5.3	5.4	7.1	4.1	2.5
1966	3.4	9.6	7.1	5.6	2.6	6.8	0.4	4.7
1967	2.0	4.5	10.4	1.8	1.7	5.9	4.1	1.2
1968	6.6	5.0	9.4	6.1	7.3	9.1	5.6	6.5
1969	6.9	4.6	10.4	6.5	7.6	7.4	8.2	6.0
1970	5.6	-2.9	8.1	1.4	7.9	2.6	3.8	6.3
1971	4.6	-3.9	7.3	2.0	3.4	5.1	4.0	4.8
1972	5.7	-1.7	7.8	6.0	0.6	4.2	6.0	6.5
1973	7.7	15.1	7.7	8.5	6.6	7.6	8.5	7.3
1974	2.8	0.7	9.4	-1.6	0.3	0.4	4.1	2.9
1975	1.6	-0.6	5.9	-5.6	0.4	4.8	4.3	0.1
1976	6.5	-1.5	6.8	7.4	3.0	6.2	10.0	5.4
1977	3.4	2.3	5.8	3.8	3.0	3.8	7.0	1.5
1978	4.1	0.9	4.0	2.6	4.6	5.2	7.3	2.1
1979	3.9	-1.8	3.7	3.1	4.7	0.6	2.9	4.8
1980	2.5	-0.4	3.3	-2.4	4.0	3.3	2.6	2.8
1981	-1.9	-3.8	1.9	-0.1	0.2	-2.0	3.6	5.1
1982	-2.0	-2.6	2.1	-2.9	0.9	5.1	1.0	3.9
1983 ^a	1.0	0.6	3.7	2.4	2.0		8.0	5.3
1984 ^a	7.0	-0.9	3.5	6.1	1.3		9.6	2.6
1985 ^b	3.7		2.7	2.5	2.0		6.2	1.9
<i>Average annual growth rate</i>								
1963-1973	5.1	3.3	8.6	4.6	4.5	6.2	4.6	5.1
1973-1985	2.4	0.7 ^c	4.1	1.2	1.9		4.9	0.6

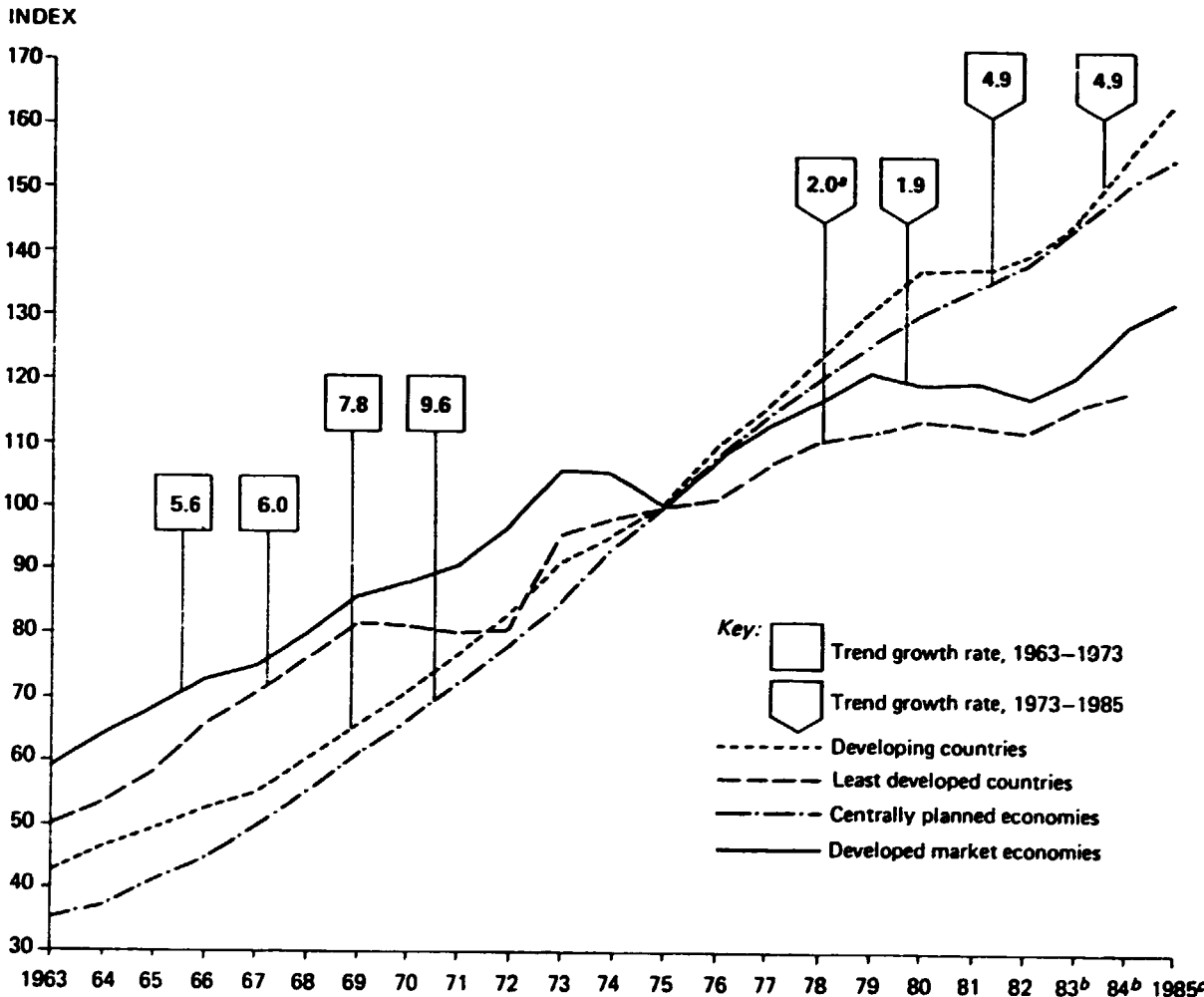
Source: UNIDO data base, information supplied by the Office of Development Research and Policy Analysis and the Statistical Office of the United Nations Secretariat, the Economic Commission for Africa and the Economic Commission for Europe, with estimates by the UNIDO Secretariat

^aPreliminary figures

^bEstimates

^cFigure refers to the period 1973-1984

Figure II. Indices of industrial production in manufacturing, by economic grouping, 1963-1985
(1975 = 100)



Source: UNIDO data base, information supplied by the Office of Development Research and Policy Analysis and the Statistical Office of the United Nations Secretariat, the Economic Commission for Africa and the Economic Commission for Europe, with estimates by the UNIDO Secretariat.

^aCovering the period 1973-1984.

^bPreliminary figures.

^cEstimates.

Table 4. Distribution and growth of manufacturing value added, by income group,^a at constant (1975) prices, selected years
(Percentage)

	1963	1973	1980	1981	1982	Growth rate of manufacturing value added, 1963-1982	Group share in population of the developing countries, 1982
Low income	18.5	13.3	11.8	12.4	12.5	4.4	50.7
Lower-middle income	10.0	9.4	10.5	11.2	11.5	7.5	17.9
Intermediate income	17.2	19.0	19.9	20.8	21.1	8.1	15.9
Upper-middle income	36.0	40.2	42.1	40.6	39.7	8.0	12.2
High income	18.3	18.1	15.7	15.0	15.2	5.3	3.3
Developing countries	100.0	100.0	100.0	100.0	100.0	6.9	100.0

Source: UNIDO data base, information supplied by the Office of Development Research and Policy Analysis and the Statistical Office of the United Nations Secretariat, with estimates by the UNIDO Secretariat.

^aIncome groups are defined in terms of the 1978 levels of gross domestic product per capita as follows: low income, < \$295, lower-middle income, \$295 to \$600, intermediate income, \$600 to \$1,320, upper-middle income, \$1,320 to \$2,415, and high income, > \$2,415

Table 5. Share of manufacturing value added in gross domestic product, by economic grouping and by income group,^a at constant (1975) prices, selected years
(Percentage)

	1960	1965	1970	1975	1980	1981	1982
Developing countries	14.2	15.4	16.6	17.7	19.0	19.0	19.0
Low income	11.2	13.6	13.8	14.1	15.0	15.2	15.0
Lower-middle income	11.0	12.3	13.5	14.6	16.4	16.5	16.6
Intermediate income	10.6	12.6	14.4	16.0	17.1	17.6	17.6
Upper-middle income	19.4	19.5	21.6	22.0	24.1	23.8	23.3
High income	17.2	16.4	16.2	17.0	17.2	17.1	17.9
Developed market economies	25.6	27.5	28.3	27.6	27.9	27.6	27.1
Centrally planned economies ^b	32.0	37.4	42.4	47.3	50.5	50.8	50.8

Source: UNIDO data base, information supplied by the Office of Development Research and Policy Analysis and the Statistical Office of the United Nations Secretariat, with estimates by the UNIDO Secretariat.

^aIncome groups are defined in terms of the 1978 levels of gross domestic product per capita as follows: low income, < \$295, lower-middle income, \$295 to \$600, intermediate income, \$600 to \$1,320, upper-middle income, \$1,320 to \$2,415, and high income, > \$2,415

^bFigures refer to the share of manufacturing value added (estimated) in net material product

Table 6. Share of economic groupings^a in world manufacturing value added, at constant (1975) prices, selected industrial branches, 1970, 1975 and 1982

(Percentage)

Branch ^b	ISIC code	Developing countries			Centrally planned economies			Developed market economies		
		1970	1975	1982	1970	1975	1982	1970	1975	1982
Food products	311/2	13.9	13.8	16.4	25.4	27.8	26.2	60.7	58.4	57.4
Beverages	313	12.8	14.6	19.1	21.7	23.6	24.2	65.5	61.8	56.7
Tobacco	314	28.1	29.0	33.6	14.7	16.3	16.6	57.2	54.7	49.8
Textiles	321	17.4	18.8	19.9	26.4	30.7	32.9	56.2	50.5	47.2
Footwear	324	10.0	11.3	12.0	36.5	41.4	46.3	53.5	47.3	41.7
Wood and cork products	331	9.8	11.1	13.8	20.0	23.3	24.6	70.2	65.6	61.6
Paper	341	6.7	7.7	9.0	7.2	9.6	9.1	86.1	82.7	81.9
Printing and publishing	342	6.4	6.9	6.4	5.7	7.3	7.3	87.9	85.8	86.3
Industrial chemicals	351	6.0	7.6	8.7	21.7	28.3	31.5	72.3	64.1	59.8
Other chemicals	352	13.4	17.4	21.4	6.5	8.0	7.3	80.1	74.6	71.3
Petroleum refineries	353	35.5	38.3	45.3	13.2	16.0	15.0	51.3	45.7	39.7
Rubber products	355	10.8	12.6	13.9	16.5	21.1	23.6	72.7	66.3	62.5
Pottery, china and earthenware	361	12.2	12.9	11.8	27.0	35.4	43.9	60.8	51.7	44.3
Glass	362	8.2	9.7	11.0	19.1	26.1	30.0	72.7	64.2	59.0
Other non-metallic mineral products	369	8.7	10.7	15.6	31.1	36.1	36.0	60.2	53.2	48.4
Iron and steel	371	6.2	8.1	11.4	19.5	23.9	26.6	74.3	68.0	62.0
Non-ferrous metals	372	8.6	9.2	10.1	29.7	36.6	38.9	61.7	54.2	51.0
Metal products, excluding machinery	381 ^c	5.9	6.9	7.1	18.7	26.6	33.6	75.4	66.5	59.3
Non-electrical machinery	382 ^c	3.0	4.9	4.3	17.6	23.8	29.6	79.4	71.3	66.1
Electrical machinery	383 ^c	5.1	6.3	6.3	18.6	25.3	27.4	76.3	68.4	66.3
Transport equipment	384 ^c	5.8	7.5	6.8	16.9	23.1	29.7	77.3	69.4	63.5

Source: UNIDO data base, information supplied by the Statistical Office of the United Nations Secretariat, with estimates by the UNIDO Secretariat

^aExcluding China

^bAccording to the *International Standard Industrial Classification of All Economic Activities*, Statistical Papers, Series M, No. 4, Rev. 2 (United Nations publication, Series No. E 68 XVII B)

^cShares for branches within ISIC 38 may be somewhat distorted owing to variations in the national reporting practices of several important producers of fabricated metal products, machinery and transport equipment

Table 7. Share of developing countries^a and developing regions in world manufacturing value added, at constant (1975) prices, selected industrial branches, 1970 and 1982

(Percentage)

Branch ^b	ISIC code	Developing regions									
		All developing countries		Africa		West Asia		South and East Asia		Latin America	
		1970	1982	1970	1982	1970	1982	1970	1982	1970	1982
Food products	311/2	13.92	16.43	1.86	1.66	0.56	1.04	3.46	5.08	8.04	8.65
Beverages	313	12.84	19.05	1.92	3.09	0.57	0.67	1.91	3.88	8.44	11.41
Tobacco	314	28.12	33.57	2.93	3.36	3.46	4.70	13.24	15.90	8.49	9.61
Textiles	321	17.42	19.90	2.17	2.32	1.26	1.27	5.89	8.48	8.10	7.83
Footwear	324	10.00	12.02	1.54	1.99	0.45	^c	1.79	3.23	6.22	6.10
Wood and cork products	331	9.80	13.81	1.32	1.51	0.41	0.47	3.65	5.63	4.42	6.20
Paper	341	6.69	8.96	0.68	0.80	0.25	0.43	1.45	2.30	4.31	5.43
Printing and publishing	342	6.41	6.37	0.54	^c	0.12	0.36	1.34	^c	4.41	3.64
Industrial chemicals	351	6.05	8.65	0.36	0.40	0.56	0.89	1.45	2.70	3.68	4.66
Other chemicals	352	13.42	21.36	1.10	1.50	0.57	0.70	3.31	4.45	8.44	14.71
Petroleum refineries	353	35.48	45.33	1.17	2.69	12.20	11.38	8.07	13.52	14.04	17.74
Rubber products	355	10.78	13.85	0.91	1.05	0.39	0.43	2.76	4.92	6.72	7.45
Pottery, china and earthenware	361	12.18	11.82	0.57	0.55	0.95	^c	2.53	2.30	8.13	8.35
Glass	362	8.17	11.04	0.52	^c	0.54	0.71	1.81	3.10	5.29	6.74
Other non-metallic mineral products	369	8.72	15.63	0.91	1.41	0.48	1.11	2.35	5.03	4.98	8.08
Iron and steel	371	6.23	11.43	0.36	0.50	0.51	0.69	1.27	3.17	4.09	7.07
Non-ferrous metals	372	8.57	10.07	0.78	0.67	0.36	0.50	1.75	2.60	5.68	6.30
Metal products, excluding machinery	381 ^d	5.88	7.05	0.56	0.68	0.30	0.37	1.21	1.78	3.81	4.22
Non-electrical machinery	382 ^d	3.00	4.27	0.10	^c	0.10	0.24	0.76	1.17	2.04	2.70
Electrical machinery	383 ^d	5.13	6.31	0.22	0.44	0.10	0.15	1.23	2.49	3.56	3.23
Transport equipment	384 ^d	5.75	6.84	0.26	0.56	0.16	0.20	1.01	1.85	4.32	4.23

Source: UNIDO data base, information supplied by the Statistical Office of the United Nations Secretariat, with estimates by the UNIDO Secretariat

^aExcluding China

^bSee table 6, footnote b

^cFigures not shown separately because the underlying data from which they would have been derived do not meet minimum standards of quality

^dShares for branches within ISIC 38 may be somewhat distorted, owing to variations in the national reporting practices of several important producers of fabricated metal products, machinery and transport equipment

Table 8. Growth of manufacturing value added, by economic grouping,^a at constant (1975) prices, 1963-1973 and 1973-1982
(Percentage)

Branch ^b	ISIC code	Developing countries		Centrally planned economies		Developed market economies	
		1963-1973	1973-1982	1963-1973	1973-1982	1963-1973	1973-1982
Food products	311/2	5.1	4.9	6.0	2.6	3.5	2.6
Beverages	313	6.5	7.5	5.5	4.6	5.1	2.2
Tobacco	314	4.2	4.9	4.2	2.9	2.4	1.4
Textiles	321	4.1	2.5	6.2	3.2	3.9	-0.3
Wearing apparel	322	3.7	3.8	6.2	4.8	3.2	-0.4
Leather and fur products	323	2.8	3.8	5.2	3.3	1.4	0.0
Footwear	324	3.0	2.4	5.6	4.1	0.8	-0.2
Wood and cork products	331	5.4	4.4	5.0	2.2	4.1	-0.6
Furniture and fixtures excluding metal	332	c	c	8.5	5.7	5.7	0.8
Paper	341	7.3	5.0	7.7	3.4	5.5	1.9
Printing and publishing	342	5.8	1.8	8.4	3.5	3.8	2.5
Industrial chemicals	351	11.8	6.1	12.2	6.4	9.1	2.0
Other chemicals	352	9.9	8.3	10.2	5.0	7.0	3.9
Petroleum refineries	353	9.4	5.5	13.7	3.6	6.9	0.8
Miscellaneous products of petroleum and coal	354	c	c	3.3	2.9	-0.1	-0.4
Rubber products	355	8.1	4.0	8.6	4.6	5.6	0.7
Plastic products	356	c	c	16.9	8.4	14.8	4.8
Pottery, china and earthenware	381	5.4	2.3	8.9	6.8	3.5	0.6
Glass	382	9.8	6.4	9.7	7.5	5.8	2.5
Other non-metallic mineral products	389	8.4	7.9	8.2	2.7	5.2	0.4
Iron and steel	371	7.9	5.7	5.5	2.4	4.7	-1.4
Non-ferrous metals	372	7.8	2.8	9.6	4.4	5.5	0.6
Metal products, excluding machinery	381	7.9	4.7			5.4	1.2
Non-electrical machinery	382	11.8	3.4			5.9	2.2
Electrical machinery	383	11.6	7.9	10.9	8.1	8.3	4.1
Transport equipment	384	9.1	3.5			5.4	1.5
Professional and scientific equipment, photographic and optical goods	385	c	c			6.3	4.0
Other manufactures	390	1.3	5.9	11.2	8.0	3.9	2.5

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations Secretariat, with estimates by the UNIDO Secretariat

^aExcluding China.

^bSee table 6, footnote b.

^cFigures not shown separately because the underlying data from which they would have been derived do not meet minimum standards of quality.

Table 9. Structure of manufacturing value added, by economic grouping,^a at constant (1975) prices, 1963, 1973 and 1982
(Percentage)

Branch ^b	ISIC code	Developing countries ^c			Centrally planned economies			Developed market economies		
		1963	1973	1982	1963	1973	1982	1963	1973	1982
Food products	311/2	19.0	14.5	14.6	15.2	11.8	9.2	10.4	8.4	9.5
Beverages	313	3.3	2.8	3.6	2.7	2.0	1.9	2.0	1.9	2.1
Tobacco	314	3.6	2.7	2.8	1.0	0.7	0.5	1.0	0.8	0.8
Textiles	321	14.0	10.6	8.5	8.7	6.9	5.5	5.4	4.5	3.7
Wearing apparel	322	3.7	2.6	2.4	5.4	4.7	4.3	3.5	2.8	2.4
Leather and fur products	323	0.9	0.6	0.5	1.0	0.7	0.6	0.7	0.4	0.4
Footwear	324	1.5	1.0	0.9	2.1	1.5	1.3	1.0	0.6	0.6
Wood and cork products	331	2.6	2.1	2.1	2.7	1.9	1.4	2.4	2.1	1.7
Furniture and fixtures excluding metal	332	1.4	1.1	0.9	1.4	1.4	1.4	2.0	2.1	1.9
Paper	341	2.3	2.5	2.4	1.2	1.1	0.9	3.8	3.8	3.6
Printing and publishing	342	3.0	2.4	1.9	1.0	1.0	0.8	5.1	4.3	4.7
Industrial chemicals	351	2.4	3.7	4.1	3.8	5.4	5.8	3.8	5.3	5.2
Other chemicals	352	4.5	5.9	7.7	0.9	1.1	1.0	3.4	3.8	4.7
Petroleum refineries	353	6.8	9.1	9.5	0.9	1.4	1.2	1.5	1.7	1.5
Miscellaneous products of petroleum and coal	354	0.5	0.7	0.6	1.2	0.8	0.6	0.6	0.3	0.3
Rubber products	355	1.7	1.8	1.6	1.1	1.2	1.1	1.4	1.5	1.3
Plastic products	356	0.9	1.4	1.2	0.3	0.7	0.8	0.9	2.0	2.4
Pottery, china and earthenware	361	0.9	0.7	0.6	0.8	0.8	0.9	0.6	0.5	0.4
Glass	362	0.7	1.0	1.0	0.8	0.9	1.1	0.9	0.9	1.0
Other non-metallic mineral products	369	3.2	3.5	4.6	5.2	5.1	4.0	3.0	3.0	2.5
Iron and steel	371	4.2	4.7	5.0	7.5	5.8	4.3	6.7	6.6	4.7
Non-ferrous metals	372	1.8	1.9	1.7	2.6	2.8	2.5	1.7	1.8	1.5
Metal products, excluding machinery	381	4.0	4.6	4.3	30.5	37.6	45.8	7.2	7.3	6.7
Non-electrical machinery	382	2.7	5.1	4.2				10.4	11.0	11.5
Electrical machinery	383	3.1	4.4	5.5				6.7	8.7	10.6
Transport equipment	384	5.2	7.0	6.1				10.3	10.3	10.0
Professional and scientific equipment, photographic and optical goods	385	0.4	0.4	0.4				1.7	1.9	2.3
Other manufactures	390	1.7	1.2	1.3	2.0	2.7	3.1	1.9	1.7	1.8
Total manufacturing	3	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: UNIDO data base, information supplied by the Statistical Office of the United Nations Secretariat, with estimates by the UNIDO Secretariat

^aExcluding Albania, China, Iceland and Luxembourg

^bSee table 6, footnote b

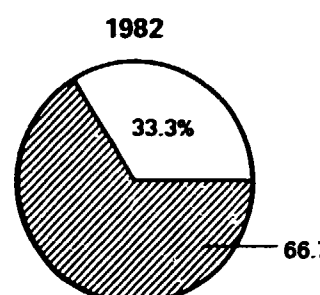
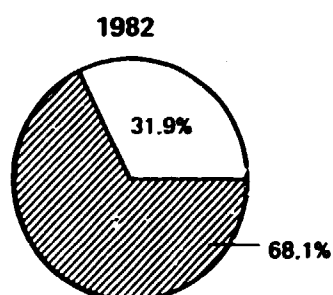
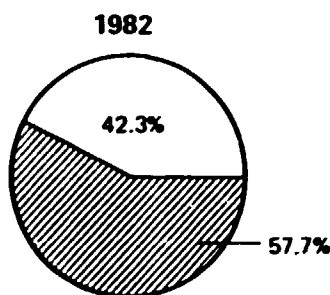
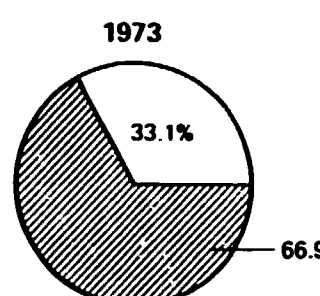
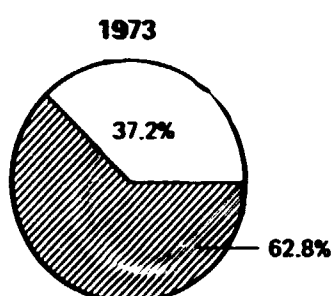
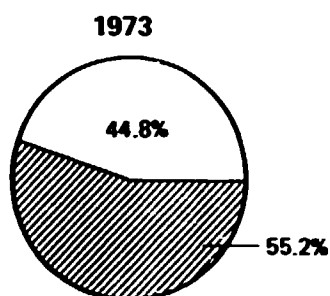
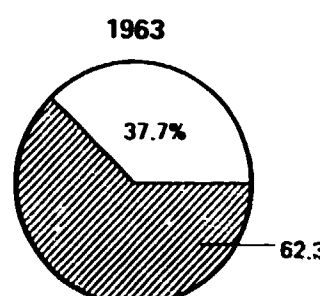
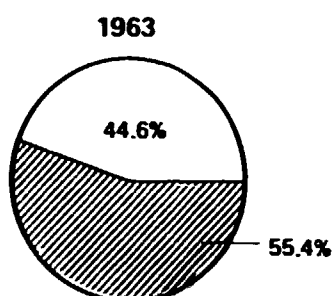
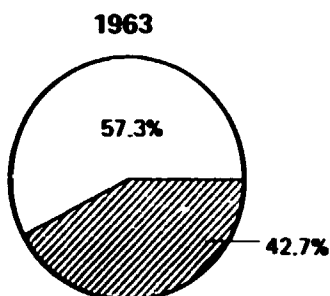
^cThe data for 1963 cover 73 countries, which, in 1975, accounted for 97 per cent of the manufacturing value added of all developing countries, the data for 1973 and 1982 cover 64 countries, which, in 1975, accounted for 92 per cent of the manufacturing value added of all developing countries. Therefore, although the structures for all years are probably representative of developing countries as a whole, the variation in country composition should be noted.

Figure III. Composition of manufacturing value added, by economic grouping, at constant (1975) prices, 1963, 1973 and 1982

Developing countries

Centrally planned economies

Developed market economies



Key:

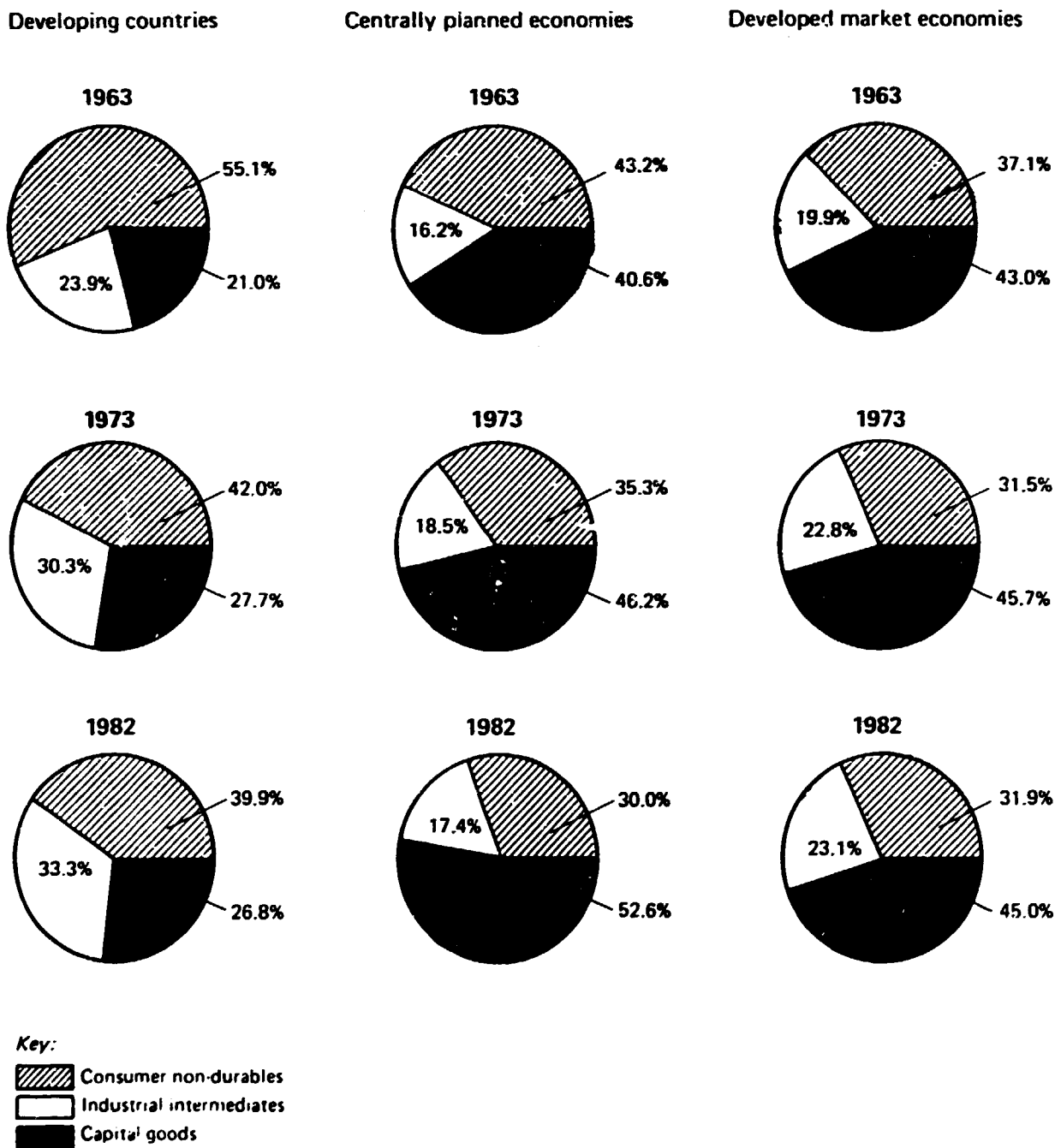
- Light industry
- Heavy industry

Source: UNIDO data base, information supplied by the Statistical Office of the United Nations Secretariat, with estimates by the UNIDO Secretariat

Light industry includes ISIC 311/2, 313, 314, 321, 322, 323, 324, 331, 332, 342, 355, 356 and 390

Heavy industry includes ISIC 341, 351, 352, 353, 354, 361, 362, 369, 371, 372, 381, 382, 383, 384 and 385

Figure IV. Composition of manufacturing value added, by end-use and by economic grouping, at constant (1975) prices, 1963, 1973 and 1982



Source: UNIDO data base, information supplied by the Statistical Office of the United Nations Secretariat, with estimates by the UNIDO Secretariat

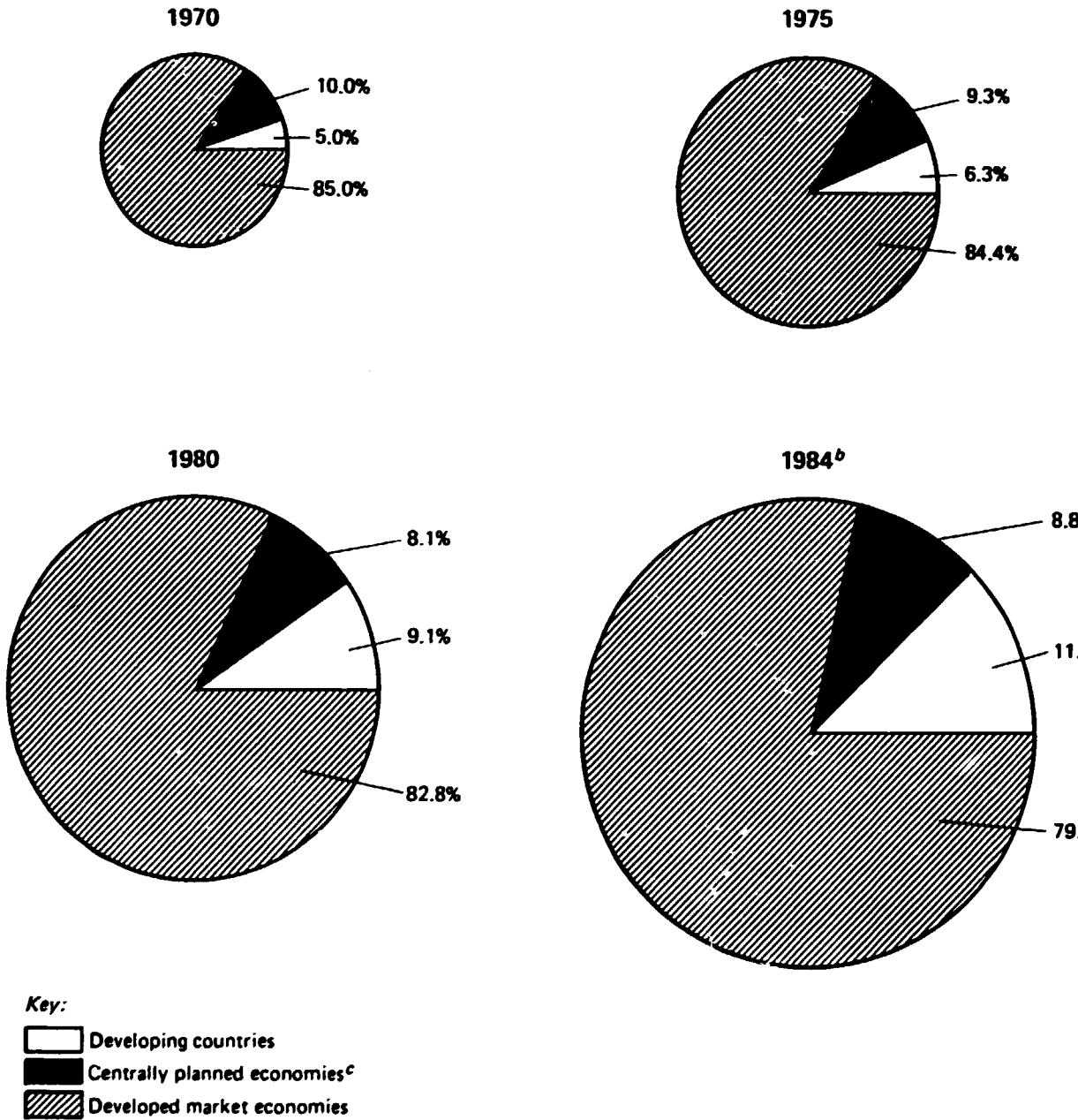
Consumer non-durables include ISIC 311/2, 313, 314, 321, 322, 323, 324, 331, 332, 342, 385 and 390

Industrial intermediates include ISIC 341, 351, 352, 353, 354, 355, 356, 361, 362 and 369

Capital goods (including consumer durables) include ISIC 371, 372, 381, 382, 383 and 384

In the case of the centrally planned economies, ISIC 385 is included in capital goods (including consumer durables)

Figure V. Share of economic groupings in world manufactured exports,^a selected years



Source: United Nations Conference on Trade and Development, *Handbook of International Trade and Development Statistics*, various issues, and United Nations, *Monthly Bulletin of Statistics*, various issues, with estimates by the UNIDO Secretariat.

^aCodes 5-8 (except 68) of the *Standard International Trade Classification, Revised* (United Nations publication, Sales No. E.81.XVII.6) (SITC, Revised). Shares of economic groupings are derived from current dollar values, whereas the relative size of each chart reflects the real value of world exports of manufactures.

^bEstimates.

^cExcluding trade among the centrally planned economies of Asia

Table 10. World trade in manufactures,^a by origin, destination and economic grouping, at current prices, selected years

Origin of exports	Year	Exports to developing countries		Exports to centrally planned economies ^b		Exports to developed market economies	
		Value (millions of dollars)	Share (percentage)	Value (millions of dollars)	Share (percentage)	Value (millions of dollars)	Share (percentage)
Developing countries	1963	1 404	41.2	102	3.0	1 902	55.8
	1970	3 231	33.7	559	5.8	5 808	60.5
	1975	11 935	37.9	1 172	3.7	18 352	58.3
	1980	37 580	38.1	3 221	3.3	57 784	58.8
	1983	41 479	33.8	4 630	3.8	76 533	62.4
Centrally planned economies ^b	1963	1 635	15.1	8 043	74.3	1 147	10.6
	1970	2 899	15.2	13 381	70.2	2 804	14.7
	1975	6 790	14.6	31 835	68.6	7 758	16.7
	1980	15 784	18.0	54 692	62.3	17 268	19.7
	1983	20 181	21.7	58 191	60.3	18 772	18.0
Developed market economies	1963	16 950	25.7	2 168	3.3	46 470	71.0
	1970	32 462	20.2	6 634	4.1	121 256	75.6
	1975	111 298	28.5	26 518	6.3	282 155	67.2
	1980	233 721	26.0	42 430	4.7	622 646	69.3
	1983	209 266	25.3	37 533	4.5	580 700	70.2

Source: See figure V.

^aSee figure V, footnote a.

^bExcluding trade among the centrally planned economies of Asia.

**STATISTICAL DATA ON THE GROWTH AND COMPOSITION OF INDUSTRIAL PRODUCTION
AND TRADE OF THE LEAST DEVELOPED COUNTRIES**

Table 11. Growth of gross domestic product and manufacturing value added, at constant (1975) prices, least developed countries of Africa, Bangladesh, all least developed countries and other developing countries, 1963-1984

(Percentage)

Year	Least developed countries of Africa		Bangladesh		All least developed countries		Other developing countries	
	Gross domestic product	Manufacturing value added	Gross domestic product	Manufacturing value added	Gross domestic product	Manufacturing value added	Gross domestic product	Manufacturing value added
<i>Increase or decrease over previous year</i>								
1964	2.4	9.3	1.8	4.3	2.0	7.0	7.5	9.3
1965	2.0	9.3	2.0	11.2	1.9	9.1	4.8	6.1
1966	3.2	16.4	-2.0	6.8	1.5	12.7	3.7	6.0
1967	2.1	6.5	10.5	14.6	4.2	7.4	4.4	4.6
1968	8.1	10.5	0.8	1.4	5.6	7.8	7.7	9.4
1969	-0.6	8.2	5.2	4.6	1.2	7.3	7.9	9.6
1970	2.5	0.2	-4.9	-14.2	0.4	-0.5	7.0	8.4
1971	5.3	8.7	-14.8	-46.1	-0.7	-1.4	6.6	7.5
1972	0.7	-5.3	2.2	58.4	0.9	0.8	5.9	8.6
1973	0.7	19.5	13.7	19.2	4.4	18.0	7.7	10.2
1974	4.1	-8.5	3.3	62.3	4.2	3.1	5.3	5.4
1975	2.7	-0.6	12.5	7.7	5.0	1.8	3.7	4.1
1976	4.5	-1.0	2.5	4.9	4.2	1.4	7.3	9.4
1977	5.3	3.2	6.4	7.5	5.3	5.2	5.6	6.0
1978	4.0	3.0	4.7	4.5	4.1	3.7	3.9	6.7
1979	0.5	2.3	2.8	-0.8	1.0	0.8	5.3	6.5
1980	2.3	0.7	6.6	8.7	3.2	2.2	3.5	4.9
1981	3.9	-0.8	1.0	-0.2	2.9	-0.9	0.8	0.6
1982	1.2	1.2	3.3	-1.6	1.7	0.4	1.0	0.9
1983 ^a	2.6	3.3	3.9	4.5	2.7	3.5	1.5	3.4
1984 ^a	0.9	2.0	2.3	2.0	1.3	1.9	3.8	9.1
<i>Average annual growth rate</i>								
1963-1973	2.9	7.6	0.5	0.2	2.1	6.0	3.3	7.8
1973-1984 ^a	3.0	0.9	4.4	5.4	3.2	2.0	3.8	5.0

Source: UNIDO data base; information supplied by the Office of Development Research and Policy Analysis of the Statistical Office of the United Nations Secretariat and the Economic Commission for Africa, with estimates by the UNIDO Secretariat.

^aPreliminary figures

Table 12. Growth of gross domestic product per capita and manufacturing value added per capita, at constant (1975) prices, least developed countries of Africa, Bangladesh, all least developed countries and other developing countries, 1963-1984

(Percentage)

Year	Least developed countries of Africa		Bangladesh		All least developed countries		Other developing countries	
	Gross domestic product per capita	Manufacturing value added per capita	Gross domestic product per capita	Manufacturing value added per capita	Gross domestic product per capita	Manufacturing value added per capita	Gross domestic product per capita	Manufacturing value added per capita
<i>Increase or decrease over previous year</i>								
1964	0.0	6.7	-0.9	1.5	-0.4	4.4	1.9	6.7
1965	-0.4	6.8	-0.6	8.4	-0.5	6.5	2.3	3.6
1966	0.6	13.4	-5.0	3.6	-1.3	9.6	1.1	3.3
1967	-0.5	3.9	7.2	11.2	1.5	4.5	1.8	2.0
1968	5.4	7.8	-2.1	-1.5	2.9	5.0	5.0	6.7
1969	-2.9	5.6	2.3	1.7	-1.3	4.6	5.3	7.0
1970	0.1	-2.2	-7.5	-16.6	-2.0	-2.9	4.4	5.8
1971	2.5	5.8	-16.8	-47.4	-3.2	-3.9	3.9	4.7
1972	-1.9	-7.7	-0.1	54.8	-1.6	-1.7	3.2	5.9
1973	-1.8	16.5	11.2	16.5	1.9	15.1	5.1	7.5
1974	1.6	-10.7	1.0	58.7	1.7	0.7	2.8	2.9
1975	0.2	-3.0	10.0	5.3	2.6	-0.6	1.3	1.7
1976	1.6	-3.8	-0.5	1.8	1.2	-1.5	4.7	6.7
1977	2.4	0.4	3.4	4.4	2.4	2.3	3.1	3.4
1978	1.2	0.2	1.8	1.6	1.3	0.9	1.5	4.2
1979	-2.1	-0.3	0.0	-3.5	-1.6	-1.8	2.9	4.0
1980	-0.3	-1.9	3.8	5.9	0.5	-0.4	1.2	2.6
1981	0.8	-3.8	-1.9	-3.1	-0.1	-3.8	-1.7	-1.8
1982	-1.7	-1.7	0.3	-4.4	-1.3	-2.6	-1.3	-1.4
1983 ^a	-0.3	0.4	1.1	1.7	-0.1	0.6	-0.9	1.0
1984 ^a	-1.8	-0.8	-0.4	-0.8	-1.5	-0.9	1.5	6.7
<i>Average annual growth rate</i>								
1963-1973	0.3	5.0	-2.3	-2.5	-0.5	3.3	3.6	5.1
1973-1984 ^a	0.2	-1.8	1.6	2.6	0.4	-0.7	1.4	2.5

Source: UNIDO data base, information supplied by the Office of Development Research and Policy Analysis and the Statistical Office of the United Nations Secretariat and the Economic Commission for Africa, with estimates by the UNIDO Secretariat.

^aPreliminary figures

Table 13. Share of the least developed countries in the manufacturing value added of all developing countries, at constant (1975) prices, selected industrial branches, 1970, 1975 and 1982

(Percentage)

Branch ^a	ISIC code	1970	1975	1982
Food products	311-2	4.57	3.05	2.67
Beverages	313	3.41	3.66	3.52
Tobacco	314	4.18	4.26	3.94
Textiles	321	4.73	4.31	3.76
Footwear	324	2.68	2.51	2.34
Wood and cork products	331	2.81	2.06	1.24
Paper	341	0.64	0.75	0.61
Industrial chemicals	351	0.83	0.89	0.96
Other chemicals	352	1.36	1.08	0.99
Petroleum refineries	353	0.71	0.38	0.26
Glass	362	1.50	1.12	1.00
Other non-metallic mineral products	369	1.73	1.32	0.88
Iron and steel	371	0.80	0.64	0.27
Non-ferrous metals	372	0.74	0.41	0.31 ^b
Electrical machinery	383	0.13	0.16	0.16
Total manufacturing	3	2.23	1.68	1.44

Source: UNIDO data base, information supplied by the Statistical Office of the United Nations Secretariat with estimates by the UNIDO Secretariat.

^aSee table 6 footnote b

^bFigure refers to 1981

Table 14. Distribution of trade by broad economic categories (BEC),^a selected least developed countries, 1970, 1975 and 1981^b

(Percentage)

Category	1970		1975		1981	
	Exports	Imports	Exports	Imports	Exports	Imports
Food and beverages						
Primary	42.1	4.8	45.9	4.4	44.5	3.6
Processed ^c	2.6	8.2	4.7	9.3	4.1	9.8
Industrial supplies						
Primary	46.3	2.8	38.7	3.6	40.1	2.5
Processed	4.5	29.2	4.7	31.0	4.1	23.4
Fuels and lubricants						
Primary	0.0	0.1	0.0	2.1	0.0	3.1
Processed	2.0	5.5	2.8	4.6	2.1	9.4
Capital goods except transport equipment	0.2	15.6	0.5	15.3	0.2	15.6
Transport equipment	0.1	15.3	0.4	15.0	0.2	15.3
Consumer goods not elsewhere classified	1.0	10.4	1.6	8.5	3.5	8.7
Goods not elsewhere specified	0.7	1.2	0.4	0.7	0.5	0.5
Non-processed goods ^c	88.4	7.7	84.6	10.1	84.6	9.2
Processed goods ^d	11.1	85.4	15.1	84.4	14.7	82.7
Total (less goods not classified under BEC)	99.5	93.1	99.7	94.5	99.3	91.9

Source: UNIDO data base

^aConsolidated categories from *Classification by Broad Economic Categories*, Statistical Papers, Series M, No. 53 (United Nations publication, Sales No. E.71.XVII.12)

^bTrade data were available for the following least developed countries: Burkina Faso, Central African Republic, Ethiopia, Haiti, Malawi, Mali, Niger, Samoa, Somalia, Sudan and United Republic of Tanzania. When data for given years were not available, data for the years closest to them were used.

^cPrimary food and beverages, industrial supplies and fuels and lubricants

^dAll categories other than those listed in footnote c above

Table 15. Imports of manufactures^a by source, selected least developed countries,^b 1970, 1975 and 1981^c

Category	SITC code	Year	Category share in total (percentage)	Sources by economic grouping ^d (percentage distribution)			
				Least developed countries	Other developing countries	Centrally planned economies	Developed market economies
Chemicals	5	1970	13.2	0.2	10.6	5.9	83.2
		1975	17.3	0.1	18.5	1.4	79.7
		1981	15.7	0.2	13.1	1.9	84.4
Basic manufactures (excluding non-ferrous metals)	6 ^e	1970	35.6	0.3	30.6	7.0	60.7
		1975	33.2	0.4	29.5	5.4	63.0
		1981	27.6	2.8	28.4	3.2	63.1
Machinery and transport equipment	7	1970	42.7	0.1	8.8	3.8	87.2
		1975	43.4	0.1	9.5	2.7	87.3
		1981	49.2	0.0	9.6	2.3	86.5
Miscellaneous manufactures	8	1970	8.5	0.7	31.9	4.3	62.3
		1975	6.1	0.5	26.6	2.4	69.3
		1981	7.5	0.2	23.2	1.3	72.7
Total manufactures	5-8 ^e	1970	100.0	0.2	18.8	5.3	75.1
		1975	100.0	0.2	18.8	3.3	76.8
		1981	100.0	0.9	16.3	2.4	78.7

Source: Based on data supplied by the Statistical Office of the United Nations Secretariat

^aSee figure V, footnote a

^bBurkina Faso, Central African Republic, Ethiopia, Haiti, Malawi, Mali, Niger, Samoa, Somalia, Sudan and United Republic of Tanzania

^cWhen data for given years were not available, data for the years closest to them were used

^dExcluding unspecified areas

^eExcluding code 68

Table 16. Exports of manufactures^a by destination, selected least developed countries,^b 1970, 1975 and 1981^c

Category	SITC code	Year	Category share in total (percentage)	Destinations by economic grouping ^d (percentage distribution)			
				Least developed countries	Other developing countries	Centrally planned economies	Developed market economies
Chemicals	5	1970	9.4	11.6	21.7	0.3	66.4
		1975	11.9	14.2	28.7	0.9	55.5
		1981	5.9	11.2	35.1	0.0	53.1
Basic manufactures (excluding non-ferrous metals)	6 ^e	1970	76.9	3.5	8.1	0.3	88.0
		1975	59.5	1.9	12.5	0.0	85.2
		1981	50.7	3.7	23.9	0.8	70.9
Machinery and transport equipment	7	1970	4.0	11.5	41.9	0.0	46.6
		1975	10.7	11.2	40.0	1.3	47.5
		1981	9.5	21.5	20.5	0.0	56.6
Miscellaneous manufactures	8	1970	9.7	4.7	27.0	0.0	68.0
		1975	17.9	3.3	18.7	0.0	77.8
		1981	33.9	1.7	21.3	0.0	76.8
Total manufactures	5-8 ^e	1970	100.0	4.7	12.6	0.2	82.4
		1975	100.0	4.6	18.5	0.3	76.3
		1981	100.0	5.1	23.4	0.4	70.5

Source: Based on data supplied by the Statistical Office of the United Nations Secretariat

^aSee figure V, footnote a

^bBurkina Faso, Central African Republic, Ethiopia, Haiti, Malawi, Mali, Niger, Samoa, Somalia, Sudan and United Republic of Tanzania.

^cWhen data for given years were not available, data for years closest to them were used

^dExcluding unspecified areas.

^eExcluding code 68.

BOOKS

THE MANAGEMENT CHALLENGE: JAPANESE VIEWS

Edited by Lester C. Thurow
Cambridge, Massachusetts, MIT Press, 1985. 237 p.
Price: \$15.69

Lester Thurow of the Massachusetts Institute of Technology (MIT) has edited a collection of papers presented by 11 Japanese experts at a conference held at MIT, evaluating Japanese growth and development experience of the 1960s and 1970s, the policies and measures adopted and reasons for success in the context of the historical background of the country and the socio-cultural traits of its people. Thurow has not only written an excellent introduction contrasting and comparing Japanese and United States experience, but also concludes each chapter with comments aimed at "reblending the American economic mixture", in other words, drawing lessons for the United States.

From the mid-1960s and particularly during the first half of the 1980s several excellent studies have been published in the Western world on the Japanese model. This study is distinctive in two respects. First, despite the title of the book it does not concentrate on the essentials of enterprise or corporate management. It is rather overwhelmingly concerned with macro aspects of the management of the economy. Secondly, the papers are contributed by well-known Japanese economists who have generally written positively and not defensively, objectively and not subjectively, not gloating over success and being keenly aware of the future perspective. Thurow himself contributes to exploding the myths and misunderstanding relating to Japan while being frank and critical of United States deficiencies.

The first three papers, "Motivation and productivity" by Hireschi Takeochi of the Long-term Credit Bank of Japan, "The impact of Japanese culture on management" by Masakazu Yamazaki of Osaka University and "The perceptions and the reality of Japanese industrial relations" by Haruo Shimada of Keio University not only deal with socio-cultural problems, but also with the labour market, allocation and development of human resources and productivity. Much more attention is paid in Japan to human resources allocation and utilization than to capital allocation and efficiency of capital utilization. Maximization of employee satisfaction rather than maximization of profits is the governing motive of Japanese management. Equality of treatment of employees (blue collar or white collar, management or labour union), job rotation, internal mobility of labour within enterprises or corporations, lifetime employment, length-of-service reward system and enterprise unionism, combined with the cultural traits of "agnosticism without nihilism", a high degree of moral ethics, working in groups and identification with the enterprise or institution, have all contributed to labour being a positive and dynamic element in enhanced

productivity, high quality of products and easy adaptability to technological change. While admitting the importance of "humanistic characteristics and cultural inheritances" Shimada is of the view that industrial success has been attained by Japan through intentional and rational efforts.

The paper by Hiroyuki Itami of Hitotsubashi University on "The firm and the market in Japan" comments on the relative use of organizational (command) and market principles in the allocation of resources within the economy. At the aggregate level there is more use of administrative guidance from Government and heavy bank involvement in day-to-day decisions, while at the micro-level the market and competition have more influence through internal labour mobility and bottom-up management.

A comprehensive analysis of "the Japanese Financial System: past, present and future" is made by Shoichi Royama of Osaka University. Bank financing has dominated the system, only 10 per cent of total funds - until recently - coming from the stock or bond market. There is over-borrowing by the corporate sector and over-lending by small and medium banks to big banks. An artificially low interest rate policy has been pursued through strict regulation by the Bank of Japan. The world economic situation in the 1980s, internationalization of financial markets and pressures from the United States and Western Europe have led to liberalization, development of money and bond markets and increase in interest rates.

The president of Seiko Instruments and Electronics, Ltd., Ichiro Hattori, in his paper on "Product diversification", explains management strategies involved in multi-dimensional operations, expanding from watches into scientific instruments, computer graphics systems and machine tool parts. To be successful, the strategic view from the top management has to be combined with information flow from the field.

Overseas marketing organization and methods of Mitsubishi Electronic Corporation is the subject of the paper by Takashi Kiuchi, one of its general managers, entitled "Strategy for overseas markets". Over a period of time more use has been made of manufacturing plants located overseas and local employees to reduce international friction.

Both "competition and co-operation among Japanese corporations" contribute to the dynamism of the Japanese economy. Munemichi Inoue of the Marubeni Corporation states in his paper that while the driving force for attaining technological and managerial excellence has been competition, co-operation exists for sharing funds and managerial know-how in overseas operations, joint ventures for new projects involving research and development etc. Concentration and cartelization have been consistently reduced in post-war Japan through the force of competition.

The last three papers in the book are policy-oriented. "Japan's industrial policy", according to Tashimasa Tsuruta, has evolved through the three post-war periods from protectionism and

promotion of infant industries to export orientation and finally market liberalization in an international system. The direct role of Government has declined, government-industry co-operation through the Ministry of International Trade and Industry and the concept of Japan Inc. are no longer considered dominant. Private enterprise, the price and market mechanism, democracy and internationalism, it is stated, are the order of the day. The role of private enterprise is again emphasized in the next paper of Suburo Okita on "Economic planning in Japan". He does of course concede the virtues of indicative planning and government guidelines. The plan which led to the doubling of national income in the 1960s emphasized the strengthening of social overhead capital and of human resources development. Japan is now working on a long-term perspective outlined in the report "Japan in the year 2000 - preparing Japan for an age of internationalization, the aging society and maturity". The accent is on transformation from energy-intensive industries to knowledge-intensive industries and services through rapid technological development into mechatronics and robotics. This long-term perspective is further elaborated in terms of anticipated changes in human resources, capital resources and productivity in the last paper included in the book, entitled "The Japanese economy: present and future", by Hisao Kanamori, President of the Japan Economic Research Centre. Thurow states that he is widely told that Japan's economic strategy is to achieve the world's highest per capita GNP by the year 2000.

Will Japan be as successful during the next 20 years as it has been during the past 20 years? Very recently, it has certainly been making sincere efforts towards internationalization, towards contributing to revitalization of the world economy and the creation of a positive-sum situation. The value of the yen, the rate of interest and consumer spending have increased and capital investment has fallen. The effects on trade balance and growth will take time. It is a moot question whether slow growth will make it possible for Japan to attain its objectives for the year 2000. A positive-sum situation for the world economy could be achieved only if Japan is able to keep its demand growing and change its economic structure and "culture" to allow imports to grow in pace with exports.

S. Nanjundan

INDUSTRIALIZATION AND DEVELOPMENT: A THIRD WORLD PERSPECTIVE

Edited by Pradip K. Ghosh

Westport, Connecticut, Greenwood Press, 1984. 566 p.

Price: \$47.21

The book under review is the first volume of a projected twenty-volume series of International Development Resource Books, being prepared under the auspices of the Center for Advanced Study of International Development, Michigan State University, United States of America. That industrialization has been selected as the theme of the first volume is an acknowledgement of its role, in the words of the preface, "as a dynamic instrument of growth essential to the rapid economic and social development of the developing countries, in particular of the least developed countries of Asia, Africa and Latin America". Although not explicitly so stated, it is presumed that other volumes in this series of resource books will deal with other sectors of development, such as agriculture, trade, transport, communications, health and education.

The book is divided into four parts. Part I includes 14 selections or readings - not 13 as stated in the foreword - on major issues of industrialization under the title "Current Issues, Trends, Analytical Methods, Strategies and Policies, Country Studies". Part II is a compilation of statistical information and sources. Part III is a bibliography of books, articles and publications. Part IV is a directory of information sources. Besides these four parts, there is a foreword, a preface, an introduction and an index.

Parts I and II are almost entirely reproductions of UNIDO reports and studies. Of the 14 selections in part I, four are from the UNIDO journal Industry and Development, two are from its predecessor Industrialization and Productivity, four are from the special issue of the Industrial Development Survey for the Third General Conference of UNIDO (World Industry since 1960: Progress and Prospects, published in 1979), one is a section from the UNIDO publication Industrialization and Rural Development, two are from the United Nations Journal of Development Planning (papers prepared for the pre-Lima meeting of the United Nations Committee for Development Planning held in Vienna in 1974) and the last one from the CEPAL Review, an article on Latin America by a staff member of UNIDO outposted to the Economic Commission for Latin America, Santiago. The 14 selections are as follows: a stock-taking of industrialization during 1960-1976 by Helen Hughes, a review of the role of industry in the Third United Nations Development Decade of the 1980s by H. C. Bos, an analysis of industrial redeployment and restructuring and international industrial co-operation required for the purpose, prepared by the UNIDO secretariat, a study of linkages in industrialization by K. N. Raj, a survey of current international issues affecting industrialization by the UNIDO secretariat, a survey of industrial plans of developing countries for the 1960s prepared by the United Nations Secretariat, an analysis of issues related to the role of industrialization in rural development by M. V. Hogg, a study of industrialization related to rural development in Bangladesh by M. T. Haq, a paper on

industrial development strategies by Ignacy Sachs and Kazmierz Laski, another paper on industrial strategies and policies by the UNIDO secretariat, a study of industrial financing by the UNIDO secretariat, an analysis of the role of the public sector in industrialization by the UNIDO secretariat, a discussion of problems encountered in implementing industrial projects by M. D. Kilbridge and finally an assessment of the industrialization debts in Latin America by H. Soze.

The statistical tables in part II of the book are either appendages of the articles in part I or from UNIDO sources. Also included is a useful bibliography of statistical information sources covering a broader scope than industry, while excluding such sources as the UNCTAD Handbook of International Trade Statistics. Parts III and IV also cover the broad development field, although the United Nations Information Series and the bibliography do not include UNIDO Industrial Abstracts, Guides to Information Sources etc.

While the book certainly brings together some of the outstanding UNIDO research studies for a wider audience, the *raison d'être* for the publication is not quite clear from the foreword (one page), preface (one page) and introduction (2 pages). The foreword stresses "third world concerns and priorities for industrial development". The preface emphasizes building up resource materials for a comprehensive look at issues and problems. The introduction points at two multifaceted purposes of the publication: to document and analyse trends and evaluate progress; and to provide the researcher with much-needed knowledge about sources of information and data. Neither of those purposes is fully served by the publication for reasons stated below.

The requirements of the general reader on development issues is met to some extent, but there are other well-focused publications available for the purpose. One of them is mentioned in the resource bibliography and has been published jointly by UNIDO and the World Bank, entitled Policies for Industrial Progress in Developing Countries edited by Cody, Hughes and Wall, Oxford, 1980. UNIDO itself documents and analyses trends and evaluates progress in its Annual Statistical Review of the World Industrial Situation and its biennial Industrial Development Survey. As for the researcher, the book under review will whet his appetite but not satisfy it by any means. The selections include practically nothing on the important questions of transfer and development of technology, feasibility studies, project selection and evaluation, human resource development for industrialization, the interface between energy and industry, and technical co-operation for industrialization, including co-operation between developed and developing countries and among developing countries themselves. There is a concentration on issues of policy and strategy, industrial planning, financing and rural development, to the exclusion of micro and practical problems faced in the process of industrialization.

Even though relying on the output of data, reports and studies by UNIDO, the book has been compiled without direct contact or co-operation with the UNIDO secretariat. Reliance has presumably been on information sources readily available in the United States, including United Nations Secretariat bibliographical sources in New York and World Bank and International Monetary Fund sources in Washington. Partly because of this, some mistakes have crept in. Closer contact with UNIDO might have provided a wider choice of materials, as well as more updated data. Much of the data is 6 to 10 years old, some even older. Use of different sources and bases makes comparison difficult.

The listing of third world countries could certainly have been improved. "Rhodesia" should have been replaced by "Zimbabwe", and the Republic of Korea (South Korea) included. Some other mistakes or lapses could be mentioned. Author's names are not always given on the first page of each article; for example, on page 152 the author is missing but his institute address is given. Note (1) on page 101 cites chapter II, which has not been included in the publication. On page 45, sixth line, the word "developing" repeats itself (instead of "developed"), thus making the sentence meaningless. On page 362, table IV, countries and column heads should be Cyprus, India, the Philippines, the Republic of Korea and Turkey, and not, respectively Brazil, Colombia, Dominican Republic, Ecuador and Panama. The reference cited for the article on page 30, viz. Industry and Development No. 5, 1978, is obviously wrong, since the article refers to events of 1979, and issue No. 5 was completed much later. The article on page 50 is from Industry and Development No. 3, 1979, and not No. 2, 1978. The bibliography lists the same publication of UNIDO on page 468 (No. 330) and page 474 (No. 352). Copyright acknowledgements made on page V to UNESCO and the Population Council cannot be understood, since no such materials have been included in the book. On the other hand, no such acknowledgement is made to UNIDO, although the foreword and the preface mention the inclusion of UNIDO materials.

Parts of some articles make strange reading in 1985 and could mislead the uninitiated. The growth rates of gross domestic product and economic sectors for the four scenarios for 1980-1990 in the section on page 33 are way beyond the actual figures during 1980-1985. The problems created through the huge budget and trade deficits of the United States, slow growth of the European economies, the trade surplus of Japan and the debt burden of developing countries, particularly in Latin America, and their effect on industrialization of developing countries could not be anticipated even in 1979, when the article was written! While the author pleads for sufficient capital to be transferred to developing countries to help finance trade deficits created by their high industrial growth rates, the actual position today is one of transfer of capital to a major developed country (the United States) to help finance its trade and budget deficit, as well as to meet debt repayment obligations of developing countries! Industrial growth rates have been low rather than high.

In another article written in 1973 or 1974 the low rate of domestic savings in India is lamented upon (page 74), whereas recent data indicate that the rate of savings is indeed high - what is low is the rate of investment!

A further example of outdatedness is the article on industrial planning (page 106 ff.), which analyses plans before 1972 or 1973. Not only is the data 15 years old, but also the goals and policies, the mechanics and modus operandi have tended to change with the change in the international economic environment. Liberalization of economies, increasing market orientation and competitiveness are the order of the day, rather than target-setting and allocation of physical and financial resources.

To sum up, the book under review is a useful introduction to the industrialization problems of developing countries, as seen from an international - not necessarily a third-world - perspective. Some parts of the book are outdated because of the rapid change in the world economic environment since the beginning of the 1980s. Nevertheless, research workers could benefit from the selected articles, the references, the bibliography and the directory of information. However, the usefulness of the book could have been enhanced through a comprehensive introduction by the editor not only explaining the coverage and limitations in the context of the changing world economic situation, but also analysing the role of international co-operation, and of UNIDO, in the field of industrialization. Closer contact and co-operation with UNIDO would enhance the quality and usefulness of any future edition of the book.

S. Nanjundan

RECENT UNITED NATIONS PUBLICATIONS PREPARED BY THE DIVISION
FOR INDUSTRIAL STUDIES, UNIDO

INPUT-OUTPUT TABLES FOR DEVELOPING COUNTRIES, VOLUME I

Sales No. E.84.II.B.6. 299 p. Price: \$30.00

INPUT-OUTPUT TABLES FOR DEVELOPING COUNTRIES, VOLUME II

Sales No. E.85.II.B.6. 316 p. Price: \$21.00

A methodological introduction in volume I of International Input-Output Tables helps to familiarize the reader with the basic problems of compilation and to establish a sound conceptual basis for the interpretation of input-output techniques.

The relationships of national accounts and input-output systems are presented, and the consistencies and divergencies between the two systems explained.

A theoretical overview of the interindustry system prepares the reader to enter into more detailed problems of the compilation. Possible variations in structure, the different valuation concepts, the use of different price definitions and the concepts and methods involved in handling imports have been treated extensively.

The conceptual introduction also serves the reader in the interpretation of the tables contained in volume II of International Input-Output Tables.

In volume I, 18 country tables (10 African, 5 Asian, 2 Latin American, 1 Southern European), and in some cases their detailed technical description, have been included. Although most of the tables are for the early 1970s, they range from 1959 to 1976.

In volume II, 15 country tables (7 Asian, 4 African, 4 Latin American) are included. The years covered are all in the early to mid 1970s.

INDUSTRY IN THE 1980s: STRUCTURAL CHANGE AND INTERDEPENDENCE

Sales No. E.85.II.B.8. 228 p. Price: \$15.50

Industry in the 1980s: Structural Change and Interdependence, the tenth edition of the Industrial Development Survey, was published in November 1985. The present issue has two main purposes: to review recent trends in fields of industry that have particular relevance for global developments; and to analyse various aspects of industrial interdependence in the context of those trends. The Survey consists of ten chapters which deal with various aspects of structural change and interdependence. Several of the chapters address issues which are international in scope. They include the evolution of global patterns of production and trade in manufacturing, an analysis of the slow-down in the growth of labour productivity and some of the implications of these developments for international policy.

Other chapters are concerned with more specific topics. An analysis of consumption patterns highlights the role of the external sector and the degree of self-sufficiency for key commodities. The results also provide a basis for international comparisons of the consumption of specific commodities. Changing patterns of comparative advantage in specific industries are the subject of another chapter. The Survey reviews methods of measuring this concept and reveals that, in many cases, some of the most efficient exporters are nevertheless large importers of the raw materials and inputs used in these industries. Efficient production is seen to depend on a country's ability to integrate its processing activities with those of its trading partners.

Among the other subjects which are considered is the role of industrial technology and its impact on patterns of trade. An empirical assessment of the relationship between technological capabilities and international competitive abilities is carried out for 90 industries. Using a heuristic concept of research and development orientation, these industries are broadly classified according to the impact which technological differences among countries have on patterns of international specialization. The following three chapters deal with aspects related to technology and labour productivity. An issue which is closely related to the emergence of new technologies is the changing requirements for skilled labour in different countries and industries. International comparisons of skill requirements which are carried out in the Survey show that the use of skilled labour increased most rapidly in industries which already employed a relatively skilled labour force. Moreover, skill-intensity tended to increase most rapidly in those industries which employed the most physical capital.

The Survey concludes with two case-studies which focus on industrial conditions in the least developed countries and the evolution of agro-food systems in both developed and developing countries. The former study looks at inter-industry linkages between industries and the tenuousness of the links between agriculture and the manufacturing sector. Finally, the evolution of agro-food

systems emphasizes the role of product development and technological change. These forces have led to an increasing standardization in patterns of food consumption and production which have placed a heavy strain in the traditional agro-food systems of developing countries. As countries shift their preferences to new staples, traditional food processing activities tend to be crowded out.

SOMMAIRE

Exportation vers les marchés de pays du Nord : élaboration
d'un indice de compétitivité industrielle

C. René Dominique et Muhittin Oral

Une étude récente parrainée par la Banque mondiale montre qu'un certain nombre de voies intéressantes s'ouvrent maintenant aux pays en cours de développement industriel qui souhaitent exporter vers les pays membres de l'Organisation de coopération et de développement économique. Cette entreprise est cependant pleine d'embûches. Le rapport propose donc un mécanisme opérationnel qui devrait permettre d'évaluer longtemps à l'avance la capacité des entreprises industrielles de pays en développement à se frayer une place sur les marchés visés. Le document utilise la notion d'efficacité X pour analyser toutes les caractéristiques essentielles de la structure théorique de l'entreprise, tout en faisant ressortir avec plus de réalisme tous les aspects de la concurrence en situation réelle. Il élargit ensuite le schéma de base en une procédure simple d'appréciation des améliorations réalisées dans la performance des entreprises nationales et considère certaines des implications de ces évaluations pour les industries nationales et les politiques industrielles des gouvernements.

Politique industrielle des pays en développement : analyse
de la réglementation relative à l'apport local

Secrétariat de l'ONUDI

Les politiques relatives à l'apport local exigent qu'un pourcentage déterminé du produit obtenu soit d'origine locale. Encore faut-il, pour que ces politiques soient efficaces, que les décideurs publics nationaux s'assurent, d'une part, qu'elles soient dûment coordonnées avec les politiques concernant la technologie, l'esprit d'entreprise et les savoir-faire des travailleurs, d'autre part, qu'elles se conjuguent aux politiques relatives au transfert non global de technologies et à la normalisation des gammes de production. Incorrectement appliquées, les politiques en question peuvent être inefficaces ou entraîner des gâchis de ressources considérables (en provoquant une élévation excessive des coûts de production unitaires). D'un autre côté, l'apport local peut fournir un élément d'un réseau international de production entretenant des rapports non de concurrence mais d'harmonieuse complémentarité avec les secteurs modernes et avancés des pays développés. En outre, pour les pays dépourvus de vastes marchés intérieurs, l'apport local peut être considéré comme un vecteur potentiel de développement d'un "apport Sud" dans des secteurs clefs tels que les biens d'équipement et l'électronique. Ce sont là quelques-unes des conclusions qui se dégagent d'un récent bilan des politiques relatives à l'apport local appliquées dans le secteur automobile dans un certain nombre de pays en développement.

L'industrie dans le monde : examen statistique 1985

Secrétariat de l'ONU

La première partie de l'examen annuel résume en dix tableaux et cinq figures les dernières statistiques disponibles sur le développement industriel de différents groupements de pays en développement et de pays développés. Elle fournit des indications, dans certains cas pour des années choisies et dans les autres pour toutes les années de la période 1963-1985, sur les parts des groupements dans la valeur ajoutée des produits manufacturiers, les taux de croissance ou les indices de production, à la structure de la production manufacturière et du commerce des produits manufacturés. On estime, par exemple, que la croissance par habitant de la valeur ajoutée des produits manufacturés s'est ralentie en 1985 dans les pays tant en développement que développés. La deuxième partie du document présente en six tableaux des statistiques analogues pour les pays les moins avancés. Un des tableaux montre, par exemple, que la croissance par habitant de la valeur ajoutée dans le secteur manufacturier a été négative dans ces pays toutes les années, sauf une comprise entre 1979 et 1984 (la dernière pour laquelle on dispose de données).

EXTRACTO

Exportación a los mercados septentrionales: elaboración de un índice de competitividad industrial

C.-René Dominique y Muhittin Oral

En un reciente estudio patrocinado por el Banco Mundial se señala que actualmente los países en vías de industrialización que desean exportar a países de la Organización de Cooperación y Desarrollo Económicos disponen de varias posibilidades interesantes, pero el camino no es nada seguro. En dicho estudio se propone un plan operacional para medir con gran antelación la capacidad de las empresas manufactureras de los países en desarrollo para competir en esos mercados. Se utiliza el concepto de eficiencia X (eficiencia de la gestión de las actividades internas de la empresa) para desarrollar todas las características esenciales de la teoría de la empresa revelando al mismo tiempo de una manera más realista todas las facetas de la competencia en la vida real. En este estudio también se amplía el plan básico transformándolo en un procedimiento sencillo para evaluar mejoras en el rendimiento de las empresas nacionales y se examinan algunas de las ramificaciones que esas evaluaciones tienen para las industrias nacionales y las políticas industriales de los gobiernos.

La política industrial en los países en desarrollo: un análisis de la reglamentación sobre el contenido local

Secretaría de la ONUDI

Las políticas relativas al contenido local exigen que un porcentaje fijo del producto sea de origen nacional. Para que esas políticas sean eficaces, los responsables de su elaboración deben asegurarse de que están estrechamente vinculadas con las políticas relacionadas con la tecnología, las aptitudes empresariales y las calificaciones de la mano de obra, y que se combinan con otras sobre desglobalización tecnológica y normalización de líneas de productos. Si se aplican de manera incorrecta las políticas relativas al contenido local pueden ser ineficientes y ocasionar una pérdida considerable de recursos (mediante unos costos unitarios de producción excesivos). El contenido local también puede proporcionar, dentro de una red de producción internacional, un elemento que armonice con los sectores más modernos y avanzados de los países desarrollados y los complementa, en lugar de competir con ellos. Además, para países que no tienen grandes mercados internos, se puede considerar el contenido local como un medio potencial de desarrollar un "contenido meridional" en sectores clave como los bienes de capital y la electrónica. Se ponen de manifiesto esos puntos en una evaluación de la experiencia adquirida en la aplicación de políticas relativas al contenido local en el sector del automóvil en diversos países en desarrollo.

Industria mundial: un examen estadístico
1985

Secretaría de la ONUDI

En la primera sección del examen anual se resumen en diez cuadros y cinco figuras las últimas estadísticas disponibles sobre el desarrollo industrial en diversas agrupaciones de países en desarrollo y desarrollados. Se dan datos, en algunos casos, para determinados años y en otros para todos los años desde 1963 hasta 1985, sobre las participaciones de los distintos grupos en el valor añadido en el sector manufacturero, las tasas de crecimiento o los índices de producción, la estructura de la actividad manufacturera y el comercio de manufacturas. Por ejemplo, se calcula que el crecimiento del valor añadido manufacturero por habitante disminuyó en 1985 tanto en los países en desarrollo como en los desarrollados. En la segunda sección se proporciona, en seis cuadros, estadísticas similares que se refieren concretamente a los países menos adelantados. Un cuadro, por ejemplo, indica que de 1979 a 1984 (último año para el cual se dispone de estadísticas) el crecimiento del valor añadido manufacturero por habitante en esos países fue siempre negativo menos un año.

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