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INDUSTRY AND DEVELOPMENT

No. 29



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Vienna, 1991

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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 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.

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ID/SER.M/29

UNIDO PUBLICATION
Sales No.: E.91.III.E.4
ISBN 92-1-106254-3
ISSN 0250-7935
02300P

Explanatory notes

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

In tables:

Totals may not add precisely because of rounding.

Two dots (..) indicate that data are not available or are not separately reported.

An em dash (—) indicates that the amount is nil or negligible.

Unless otherwise indicated, a minus sign (-) before a figure indicates an amount subtracted, and a plus sign (+) before a figure indicates an amount added.

The following abbreviations are used in this publication:

| | |
|---------|---|
| CMEA | Council for Mutual Economic Assistance |
| CSIR | Council for Scientific and Industrial Research |
| DRC | domestic resource cost |
| ECE | Economic Commission for Europe |
| EFTA | European Free Trade Association |
| ERP | effective rate of protection |
| ILO | International Labour Organisation |
| IRR | internal rate of return |
| ISIC | International Standard Industrial Classification |
| MIST | Ministry of Industries, Science and Technology (Ghana) |
| MVA | manufacturing value added |
| NPV | net present value |
| OECD | Organisation for Economic Co-operation and Development |
| OER | official exchange rate |
| R and D | research and development |
| SCF | standard conversion factor |
| SER | shadow exchange rate |
| SITC | Standard International Trade Classification |
| USSR | Union of Soviet Socialist Republics |

Countries are referred to by the names that were in official use at the time the relevant data were collected.

RECENT TRENDS IN FOREIGN DIRECT INVESTMENT FLOWS
TO EUROPEAN MEMBER COUNTRIES OF THE COUNCIL
FOR MUTUAL ECONOMIC ASSISTANCE*

Secretariat of UNIDO**

Introduction

The dramatic changes under way in the countries of Eastern Europe mark a turning-point in the economic and political history of the period since the Second World War. A profound transformation of the global economic landscape is taking place as a consequence of those changes, with repercussions on financial, trade and investment flows, and hence on all actors in the global competitive system.

Most European member countries of the Council for Mutual Economic Assistance (CMEA) are currently in a phase of transition and restructuring within the overall context of a major shift in industrial strategy and policies. Their economic reform programmes are designed to encourage reliance on market forces, promote private industry, enhance the flexibility of the economic system, and adjust economic structures so as to better utilize the comparative advantages of the countries concerned. Most of the programmes assign a major role to foreign direct investment as a means of bringing in modern technology and raising competitiveness and export earnings. To that end, many European CMEA countries have taken legal steps to create a climate more conducive to attracting foreign investment.

The increased emphasis on promoting the inflow of foreign capital occurs at a time when the determinants of foreign investment and the structure of international investment flows are subject to significant changes. In particular, the following features seem to be emerging:

(a) Foreign direct investment is gradually moving away from the export-oriented production of simple consumer goods and expanding into technologically more sophisticated production lines such as industrial electronics, machine tools and automobiles. Investment costs thus tend to be higher;

(b) Investors generally tend to favour locations allowing them to serve regional and international export markets and, at the same time, to have access to an attractive domestic market in the home country;

*This article is based on data for periods extending up to October 1989. Since then, further rapid developments have taken place that are not reflected in the present analysis.

**Regional and Country Studies Branch.

(c) An increasing share of total foreign direct investment is directed to the services sector, with the following key areas: banking, insurance and other financial services; wholesale and retail trade; and hotels and other tourism-related facilities;

(d) Labour cost differentials are gradually losing their significance as crucial determinants of foreign direct investment with the decline in the share of labour in the total costs of most industries, largely as a result of micro-electronics-related automation. More generally, lower production costs are being eclipsed by other qualitative investment determinants, such as technological and human resources;

(e) Medium-sized and even some small companies are becoming more active as investors in foreign countries. In many cases, such companies have built up a competitive position in certain product groups in their domestic markets but are subsequently forced "to go international";

(f) As more countries are offering substantial incentives to attract foreign direct investment, the international market for investment locations has become extremely competitive, thus increasing the bargaining power of potential investors;

(g) The growing regionalization of international trade, especially among member countries of the Organisation for Economic Co-operation and Development (OECD), seems to further accentuate the dominance of highly industrialized countries as both sources and recipients of foreign direct investment.*

Notwithstanding the high degree of competition in the international market for investment locations, the CMEA countries can be expected to establish themselves as attractive sites on the global map for foreign direct investment. It is no surprise, therefore, that Governments in traditional host countries for such investment - developed and developing countries alike - are concerned that present and future investment flows may be diverted from their territories to the European CMEA countries.

Yet it is far too early to fully appreciate the far-reaching implications of the changing global context of foreign direct investment, particularly with regard to the issue of investment creation versus investment diversion. The present paper therefore has the rather modest objective of providing a review of recent trends in the flow of foreign direct investment to CMEA countries and shedding some light on emerging patterns in terms of countries of origin and the distribution of inflowing investment by industrial branch. The potential implications for developing countries are also outlined.

*For a detailed analysis of these changes in global foreign direct investment flows, see United Nations Industrial Development Organization, Foreign Direct Investment Flows to Developing Countries: Recent Trends, Major Determinants and Policy Implications (PPD.167).

1. NEW LEGISLATION RELATING TO FOREIGN DIRECT INVESTMENT IN EUROPEAN CMEA COUNTRIES

Although interest in and opportunities for business ventures by transnational corporations in CMEA countries have only recently begun to bear fruit, it should be borne in mind that flows of foreign direct investment into those countries predated the political and economic reforms of 1989 and the reform movement in the Union of Soviet Socialist Republics (USSR) since 1985. Laws allowing foreign investment in those countries have a rather long history dating back to 1972 in Hungary and Romania, 1976 in Poland and 1980 in Bulgaria. However, such laws generally allowed foreign enterprises market access only through joint ventures with a State trading organization or a domestic enterprise, in most cases restricted the foreign firms to minority ownership, and set limits on profit remittances. As a result of such restrictions, foreign enterprises typically used joint ventures as trading operations rather than for full-scale manufacturing activities. With limited investment opportunities, the number of joint ventures and the amounts of capital invested by foreign firms remained insignificant.

To create more attractive conditions for foreign direct investment in their economies, Bulgaria, Czechoslovakia, Hungary, Poland and the USSR made significant amendments to their joint venture laws and regulations in late 1988 and 1989. There are a number of common elements in the new legislation, aiming largely at separating public administration from actual management in running the economy. Screening procedures for joint ventures have been simplified and the scope and eligibility for such partnerships expanded. The autonomy of enterprises in appointing top management and setting wages and prices has been further increased. The principles governing the repatriation of profits, foreign majority shareholdings, the nationality of directors and taxation have been substantially modified, and a number of important legal guarantees against expropriation and divestment have been provided to foreign firms. In one or two cases, the right of domestic enterprises to participate directly in foreign trade operations has been extended. The new regulations in the various countries are outlined below:*

(a) USSR. Entitled "On Further Development of Foreign Economic Activities of State, Co-operative and other Social Enterprises, Amalgamations and Organizations", the new Soviet decree dated 2 December 1988 significantly broadens the scope for foreign and local participation in joint ventures. Among other things, the decree permits foreign majority holdings and foreign chairmanship or directorship of enterprises. Both State enterprises and co-operatives may now become joint-venture partners. Joint-venture enterprises have been given complete discretion in hiring and

*A brief account of only the most significant changes in investment laws and codes is given. For further information the reader is referred to the rapidly growing body of literature on the subject.

firing employees and in fixing salaries. The decree grants special incentives to joint ventures establishing operations in Soviet East Asia, including a three-year tax holiday and substantial concessions to firms manufacturing consumer goods, medical equipment and high-technology products;

(b) Hungary. Act No. VI on "Economic Associations" and Act No. XXIV on "Investment of Foreigners in Hungary" in effect dismantle the centralized organization of Hungarian enterprises and permit the creation of economic organizations previously unheard of in countries with centrally planned economies. The Act on "Economic Associations" allows individual citizens to form business ventures with local or foreign companies. Further, it facilitates such collaboration by allowing those forms of partnership best suited for small and private entrepreneurs, namely, unlimited and limited liability companies. Citizens may invest their assets in business ventures. Act No. XXIV allows foreigners to hold up to 100 per cent interest in a Hungarian company and provides important safeguards for their investments. A third and most important piece of legislation, which entered into force on 1 July 1989, enables the transformation of State-owned enterprises into "self-governing" shareholding companies;

(c) Poland. The law entitled "Economic Activity with Participation of Foreign Partners", enacted on 1 January 1989, creates a unified legal framework for foreign investment in Poland. Earlier, Poland had a double system of foreign investment under which small private investments by foreigners of Polish descent, in "Polonia" firms, were administered differently from larger investments in joint ventures with State enterprises. The law creates a unique, high-level Foreign Investment Agency responsible for approving and promoting foreign investment agreements;

(d) Bulgaria. Decree No. 56 on "Economic Activities" went into effect on 11 January 1989. It provides the legal basis for foreign economic participation through wholly owned subsidiaries or through representative offices and joint ventures, and strengthens the position of foreign firms. Foreign banks may be similarly established, but a minimal capitalization is imposed. Foreign firms may now issue shares locally;

(e) Czechoslovakia. The law on "Enterprises with Foreign Capital Participation", enacted on 1 January 1989, establishes a comprehensive legal framework for foreign investment in Czechoslovakia, replacing the non-statutory operating principles used previously. Czechoslovak firms, co-operatives, and banks may become partners. Joint ventures may retain all foreign earnings, keep a foreign currency account in a local or foreign bank, and set their own prices according to market conditions.

II. FLOWS OF FOREIGN DIRECT INVESTMENT TO EUROPEAN
CMEA COUNTRIES: RECENT EVIDENCE

A. Overall trends

There has been very strong growth in the number of joint ventures registered in the European CMEA countries and Yugoslavia. According to the data base of the Economic Commission for Europe (ECE), there were, in total, 165 joint ventures at the beginning of 1988. By the end of June 1989, that figure had climbed to 1,375. By mid-October, more than 700 additional joint ventures had been added, and by the end of the year the overall total had climbed even further to 3,345. The three CMEA countries that have most liberalized their joint venture legislation, Hungary, Poland and the USSR, accounted for the bulk of the surge in foreign direct investment.

In the USSR, since the registration of joint ventures began on 1 January 1987, the number has risen dramatically, with the major increase occurring in 1989, as reflected in table 1. The increase can be attributed, at least in part, to the new regulations adopted in December 1988, authorizing co-operatives to participate in joint ventures.

Table 1. Number and statutory capital of joint ventures
in the USSR, May 1987-September 1989

| Month and year | Statutory capital | | | Joint ventures |
|----------------|-----------------------------------|--|-------------|-------------------|
| | Total (millions of roubles) | Foreign (millions of roubles) (millions of dollars) | | |
| 1987 | | | | |
| May | 0.8 | 0.4 | 0.6 | 1 |
| June | 5.4 | 2.5 | 3.9 | 4 |
| July | 57.1 | 19.5 | 30.5 | 2 |
| August | -- | -- | -- | 0 |
| September | 2.0 | 0.8 | 1.3 | 1 |
| October | 37.3 | 11.6 | 18.4 | 3 |
| November | 11.4 | 5.6 | 9.2 | 3 |
| December | 45.4 | 15.1 | 25.5 | 2 |
| Total | 159.3 | 55.5 | 89.3 | 23 |
| 1988 | | | | |
| January | 40.0 | 14.9 | 25.1 | 6 |
| February | -- | -- | -- | 0 |
| March | 28.0 | 10.4 | 17.5 | 7 |

continued

Table 1 (continued)

| Month and year | Statutory capital | | | Joint ventures |
|----------------|-----------------------------------|--|---------|----------------|
| | Total (millions of roubles) | Foreign (millions of (millions of roubles) (dollars) | | |
| April | 13.2 | 6.2 | 10.4 | 5 |
| May | 58.0 | 23.0 | 38.7 | 10 |
| June | 54.1 | 18.3 | 30.4 | 12 |
| July | 74.1 | 30.9 | 49.8 | 9 |
| August | 33.2 | 14.3 | 22.8 | 16 |
| September | 44.6 | 16.2 | 25.8 | 17 |
| October | 13.7 | 5.7 | 9.1 | 8 |
| November | 183.9 | 71.8 | 118.9 | 30 |
| December | 109.6 | 41.0 | 68.2 | 48 |
| Total | 652.3 | 252.7 | 416.6 | 168 |
| 1989 | | | | |
| January | 140.2 | 55.7 | 92.1 | 53 |
| February | 99.7 | 33.3 | 53.9 | 46 |
| March | 143.7 | 69.0 | 111.2 | 87 |
| April | 125.3 | 57.7 | 92.1 | 53 |
| May | 260.8 | 120.1 | 184.8 | 101 |
| June | 429.7 | 202.8 | 312.0 | 160 |
| July | 113.9 | 31.0 | 48.8 | 66 |
| August | 219.3 | 96.2 | 151.5 | 126 |
| September | 110.2 | 45.2 | 69.9 | 58 |
| Total | 1 642.7 | 711.1 | 1 115.0 | 738 |
| Grand total | 2 454.4 | 1 019.3 | 1 620.8 | 929 |

Source: Economic Commission for Europe data base on joint ventures.

In cumulative terms, during the period from 1987 until the third quarter of 1989, the total capitalization of joint ventures in the USSR reached 2,454.4 million roubles (R). As compared with the end of 1988, when total capital was R 811.6 million, the total capital thus increased threefold. The cumulative foreign capital invested up to the beginning of October 1988 amounted to 1,620.8 million United States dollars (\$). After the relaxation of foreign participation rules in December 1988, from which date foreign partners have been allowed to hold majority shares in joint enterprises, 65 companies have been registered, in which foreign partners hold more than 50 per cent of the statutory capital. In 19 joint ventures, foreign participation is more than 60 per cent, and in six it is more than 70 per cent. No enterprises in which

the foreign share in capitalization exceeds 90 per cent* have been registered.

In Poland, since regulations changed in December 1988, thereby liberalizing, to some extent, foreign investments in the country, the number of joint ventures has increased. By 30 September 1989, a total of 490 new joint ventures had been approved, with total equity paid up by foreign partners amounting to \$70.3 million. By October 1989, over 600 new joint ventures had been approved, as shown in table 2.

Table 2. Number of joint ventures in Poland,
December 1988-October 1989

| Month and year | Joint ventures |
|---------------------------------|----------------|
| 31 December 1988-1 July 1989 | 52 a/ |
| 1 January 1989-28 February 1989 | 9 b/ |
| 1989 | |
| March | 21 |
| April | 41 |
| May | 60 |
| June | 72 |
| July | 105 |
| August | 92 |
| September | 90 |
| October | 115 |
| Total | 657 |

Source: Foreign Investment Agency of Poland.

Note: The total paid-up equity of 605 new joint ventures approved until end-October 1989 is estimated at approximately \$120 million, plus investment loans amounting to about \$350 million.

a/ Under 1986 joint venture law.

b/ Under 1988 investment law.

The number of joint ventures in operation in Hungary by the end of March 1989 was 178 (see table 3). However, that figure considerably underestimates the total number of foreign direct investment projects in Hungary, which, by the end of October 1989, were

*Economic Commission for Europe data base on joint ventures.

estimated at about 600, including both joint ventures and wholly foreign-owned companies.*

Table 3. Number and capital of operating joint ventures in Hungary, 1974-1989

| Year | Total capital (millions of forint) | Foreign capital | | Joint ventures |
|---------|------------------------------------|----------------------|-----------------------|----------------|
| | | (millions of forint) | (millions of dollars) | |
| 1974 | 92.2 | 45.0 | 4.9 | 2 |
| 1975 | 118.2 | 57.8 | 6.4 | 3 |
| 1976 | 118.2 | 57.8 | 6.4 | 3 |
| 1977 | 118.2 | 57.8 | 6.4 | 3 |
| 1978 | 118.2 | 57.8 | 6.4 | 3 |
| 1979 | 829.8 | 527.2 | 19.6 | 4 |
| 1980 | 969.2 | 595.8 | 21.7 | 6 |
| 1981 | 1 094.8 | 654.8 | 23.4 | 7 |
| 1982 | 1 540.5 | 859.8 | 29.0 | 12 |
| 1983 | 2 108.0 | 1 088.1 | 34.3 | 20 |
| 1984 | 2 350.3 | 1 143.7 | 35.5 | 27 |
| 1985 | 3 568.3 | 1 565.7 | 44.1 | 45 |
| 1986 | 5 207.0 | 2 501.7 | 64.5 | 62 |
| 1987 | 8 799.1 | 3 973.3 | 95.8 | 102 |
| 1988 | 27 167.6 | 12 239.5 | 259.8 | 176 |
| 1989 a/ | 27 764.8 | 12 424.1 | 263.2 | 177 |

Source: Economic Commission for Europe data base on joint ventures.

a/ As of 1 April 1989.

As regards the 178 operating joint ventures, during the period from 1985 to the end of the first quarter of 1989, the total amount of capital invested grew from 3.6 billion to 27.8 billion forint (Ft), that is, almost eightfold. During the same period, the cumulative sum of foreign capital invested grew from \$44.1 million to \$263.3 million, that is, sixfold at current official exchange rates.

In other European CMEA countries, recent growth in joint ventures has been less impressive. The number of registrations in Czechoslovakia grew from 7 to 50; Bulgaria registered an increase from 15 to 35; and no new joint ventures were registered in Romania.

*Economic Commission for Europe data base on joint ventures.

B. Countries of origin

Taking European CMEA countries as a whole, the main investors are from member countries of the European Economic Community (EEC), followed by those from member countries of the European Free Trade Association (EFTA). Rather far back are foreign investors originating from other centrally planned economies or from the United States of America and Japan. Developing countries, as a group, have only a marginal interest in foreign direct investment in CMEA countries as yet, but such investment is gaining in significance for selected developing countries.

In the USSR, as seen from table 4, 599 joint ventures (or 64.5 per cent of the total) have foreign partners from Western Europe, 35.2 per cent of which have parent companies in member countries of the EEC and 26.6 per cent in EFTA, the rest of Western Europe accounting for 2.5 per cent. Companies from the United States and Japan established, respectively, 9.3 per cent and 1.9 per cent of the joint ventures, while the share of developing countries is 5.3 per cent. The Federal Republic of Germany is the main foreign investor, accounting for 139, or 15 per cent, of the joint ventures, followed by Finland with 101, or 11 per cent.

Table 4. Joint ventures in the USSR, by origin of foreign partner, as of 1 October 1989

| Region, country or area | Statutory capital | | | Joint ventures |
|---------------------------------|-----------------------------------|-------------------------------------|-------------------------------------|-------------------|
| | Total (millions of roubles) | Foreign (millions of roubles) | Foreign (millions of dollars) | |
| Western Europe | 1 588.3 | 639.4 | 1 017.2 | 599 |
| EEC | 992.6 | 390.7 | 620.4 | 327 |
| Belgium | 2.1 | 1.2 | 1.9 | 7 |
| Denmark | 2.5 | 0.9 | 1.6 | 2 |
| France | 190.1 | 80.4 | 127.9 | 32 |
| Germany, Federal Republic of | 358.0 | 144.0 | 227.1 | 139 |
| Greece | 5.8 | 2.8 | 4.4 | 5 |
| Ireland | 16.8 | 8.1 | 13.3 | 3 |
| Italy | 227.7 | 77.2 | 124.9 | 53 |
| Luxembourg | 1.3 | 0.5 | 0.8 | 6 |
| Netherlands | 40.0 | 15.1 | 23.4 | 15 |
| Spain | 46.9 | 19.3 | 31.1 | 12 |
| United Kingdom | 101.4 | 41.2 | 64.0 | 53 |
| EFTA | 491.7 | 202.5 | 321.4 | 247 |
| Austria | 142.9 | 45.5 | 72.2 | 53 |
| Finland | 183.9 | 81.4 | 127.7 | 101 |
| Norway | 3.5 | 0.9 | 1.5 | 4 |
| Sweden | 78.4 | 37.5 | 59.6 | 32 |
| Switzerland | 67.0 | 29.4 | 47.9 | 45 |
| Liechtenstein | 15.9 | 7.8 | 12.4 | 12 |

continued

Table 4 (continued)

| Region, country or area | Statutory capital | | | Joint ventures |
|---|-----------------------------------|-------------------------------------|--------------------------|-------------------|
| | Total (millions of roubles) | Foreign (millions of roubles) | (millions of dollars) | |
| Other Europe | 104.0 | 46.2 | 75.5 | 25 |
| Cyprus | 7.2 | 2.6 | 4.1 | 9 |
| Malta | 1.5 | 0.6 | 1.0 | 1 |
| Yugoslavia | 95.3 | 43.0 | 70.4 | 15 |
| Japan | 44.4 | 21.2 | 33.9 | 18 |
| United States | 250.2 | 121.7 | 190.6 | 86 |
| Developing countries or areas | 56.2 | 23.1 | 36.6 | 49 |
| Afghanistan | 2.2 | 1.1 | 1.7 | 1 |
| Brazil | 9.2 | 2.3 | 3.8 | 2 |
| Hong Kong | 0.6 | 0.3 | 0.5 | 1 |
| India | 13.7 | 5.4 | 8.6 | 14 |
| Jordan | 0.3 | 0.2 | 0.2 | 2 |
| Kuwait | 3.1 | 1.5 | 2.5 | 3 |
| Lebanon | 2.4 | 1.2 | 1.9 | 2 |
| Pakistan | 5.5 | 3.3 | 5.1 | 1 |
| Panama | 2.3 | 1.1 | 1.8 | 3 |
| Republic of Korea | 0.5 | 0.3 | 0.4 | 1 |
| Saudi Arabia | 0.2 | 0.1 | 0.1 | 1 |
| Singapore | 3.1 | 1.1 | 1.8 | 5 |
| Syrian Arab Republic | 6.7 | 2.6 | 4.2 | 3 |
| Thailand | 0.6 | -- | -- | 1 |
| United Arab Emirates | 3.0 | 1.5 | 2.3 | 2 |
| Venezuela | 2.7 | 1.1 | 1.8 | 7 |
| Centrally planned economies | 253.6 | 113.1 | 181.6 | 88 |
| CMEA | 199.1 | 87.9 | 141.6 | 68 |
| Bulgaria | 100.9 | 43.8 | 71.6 | 26 |
| Czechoslovakia | 4.0 | 1.8 | 2.9 | 3 |
| German Democratic Republic | 5.0 | 2.5 | 4.0 | 1 |
| Hungary | 50.0 | 21.9 | 34.9 | 12 |
| Poland | 36.1 | 16.5 | 26.0 | 23 |
| Viet Nam | 3.0 | 1.4 | 2.2 | 3 |
| Others | 54.5 | 25.3 | 40.0 | 20 |
| China | 25.5 | 11.1 | 17.4 | 13 |
| Democratic People's Republic of Korea | 29.0 | 14.2 | 22.6 | 7 |

continued

Table 4 (continued)

| Region, country or area | Statutory capital | | | Joint ventures |
|----------------------------|-----------------------------------|-------------------------------------|-------------------------------------|-------------------|
| | Total (millions of roubles) | Foreign (millions of roubles) | Foreign (millions of dollars) | |
| Other countries | | | | |
| or arrangements | 262.8 | 101.1 | 161.2 | 89 |
| Australia | 19.1 | 9.5 | 15.1 | 9 |
| Canada | 56.2 | 24.6 | 39.8 | 20 |
| New Zealand | 1.5 | 0.6 | 0.9 | 2 |
| Multi-party a/ | 186.0 | 66.4 | 105.4 | 58 |
| Total | 2 454.4 | 1 019.3 | 1 620.8 | 929 |

Source: Economic Commission for Europe data base on joint ventures.

a/ Joint ventures with foreign partners from two or more countries.

Table 5, which shows foreign investment in Poland by origin of the foreign partner, demonstrates even more clearly than the case of the USSR that a substantial majority of the foreign investors - no less than 150 joint ventures, or more than 82 per cent - are from Western Europe.

Table 5. Joint ventures in Poland, by origin of foreign partner, as of 1 June 1989

| Region, country or area | Statutory capital | | | Joint ventures |
|---------------------------------|----------------------------------|------------------------------------|-------------------------------------|-------------------|
| | Total (millions of zlotys) | Foreign (millions of zlotys) | Foreign (millions of dollars) | |
| Western Europe | 25 189.6 | 10 711.4 | 21.0 | 150 |
| EEC | 19 015.8 | 8 307.5 | 16.2 | 112 |
| Belgium | 450.6 | 217.1 | 0.4 | 5 |
| Denmark | 81.0 | 39.7 | 0.1 | 2 |
| France | 20.0 | 10.3 | -- | 1 |
| Germany, Federal Republic of | 8 101.4 | 4 211.0 | 7.7 | 79 |
| Italy | 3 743.4 | 900.7 | 1.2 | 6 |
| Netherlands | 584.6 | 415.5 | 0.7 | 7 |
| Spain | 170.4 | 78.0 | 0.1 | 2 |
| United Kingdom | 5 864.5 | 2 435.3 | 6.0 | 10 |

continued

Table 5 (continued)

| Region, country or area | Statutory capital | | | Joint ventures |
|------------------------------------|----------------------------------|-------------------------|-------------------------------------|-------------------|
| | Total (millions of zlotys) | (millions of zlotys) | Foreign (millions of dollars) | |
| EFTA | 6 173.7 | 2 403.9 | 4.8 | 38 |
| Austria | 3 427.3 | 1 106.7 | 2.0 | 16 |
| Finland | 388.5 | 61.8 | 0.1 | 1 |
| Liechtenstein | 536.0 | 263.5 | 0.7 | 3 |
| Norway | 49.9 | 39.9 | 0.1 | 1 |
| Sweden | 867.4 | 457.7 | 0.9 | 10 |
| Switzerland | 904.7 | 474.2 | 1.0 | 7 |
| United States | 4 289.1 | 2 279.8 | 4.1 | 13 |
| Developing countries | 162.8 | 114.1 | 0.2 | 4 |
| Lebanon | 62.0 | 62.0 | 0.1 | 1 |
| Thailand | 42.0 | 25.2 | -- | 1 |
| Tunisia | 55.0 | 25.0 | -- | 1 |
| United Arab Emirates | 3.8 | 1.9 | -- | 1 |
| Centrally planned economies | 689.0 | 310.8 | 0.7 | 5 |
| Hungary | 119.0 | 47.6 | 0.1 | 1 |
| USSR | 570.0 | 263.2 | 0.6 | 4 |
| Other countries or arrangements | 2 295.6 | 871.6 | 2.0 | 10 |
| Unknown | 657.2 | 170.9 | 0.4 | 1 |
| Total | 32 626.0 | 14 287.4 | 28.0 | 182 |

Source: Economic Commission for Europe data base on joint ventures.

a/ Joint venture with foreign partners from two or more countries.

The Federal Republic of Germany, with 79 joint ventures, accounts for 43.4 per cent of the total. The dominance of that country's investments in Poland is revealed by the fact that the next biggest investor in the country - Austria - has only 16 joint ventures. Few developing countries have joint ventures in Poland, while Japan has none.

In Hungary, in almost half (46.6 per cent) of the operating joint ventures, the foreign partner is from a non-EEC Western European country. In the total number of 178 joint ventures, the foreign partner is from Austria in 49 cases, from Switzerland in 18, and from Sweden in 10. In one third (34.8 per cent) of the cases, the foreign party originates from the EEC. In that group, the Federal Republic of Germany holds first place with 37 joint

ventures, followed by the Netherlands with eight, and the United Kingdom with five.*

If foreign participation is measured by the amount of capital invested by foreign parties, the picture changes significantly from the foregoing. By such a yardstick, the Republic of Korea is first, with \$95 million invested, which amounts to 36.4 per cent of the total foreign investment. That country is followed by the Federal Republic of Germany, with \$28.6 million, and Austria, with \$28.5 million. Companies from those three countries and from Switzerland and the Netherlands account for \$177.1 million, that is, 67.3 per cent, of the total foreign investment of \$263.3 million. The statutory capital of the joint ventures in which the companies participate is 18 billion forint, that is, 64.9 per cent, of the total statutory capital of the joint ventures reviewed.*

In Czechoslovakia, as in Hungary, it is Austria that is home to most of the joint ventures, with 10 (26 per cent of the total), followed by France with 5, the USSR and the Federal Republic of Germany with 4 each, and the Netherlands with 3 (see table 6).

Table 6. Joint ventures in Czechoslovakia, by origin of foreign partner, as of 1 October 1989

| Region, country or area | Total (millions of koruny) | Statutory capital | | Joint ventures |
|---------------------------------|----------------------------------|-------------------------|--------------------------|-------------------|
| | | (millions of koruny) | (millions of dollars) | |
| Western Europe | 1 770.1 | 286.4 | 42.0 | 28 |
| EEC | 599.0 | 206.7 | 30.2 | 17 |
| Belgium | 4.5 | 1.5 | 0.1 | 1 |
| Denmark | 165.3 | 81.0 | 14.9 | 2 |
| France | 134.5 | 65.1 | 7.3 | 5 |
| Germany, Federal Republic of | 31.2 | 14.7 | 1.7 | 4 |
| Netherlands | 241.0 | 33.4 | 5.5 | 3 |
| United Kingdom | 22.5 | 11.0 | 0.7 | 2 |
| EFTA | 171.1 | 79.7 | 11.8 | 11 |
| Austria | 162.2 | 75.2 | 11.5 | 10 |
| Sweden | 8.9 | 4.5 | 0.3 | 1 |
| Centrally planned economies | 245.2 | 122.6 | 18.4 | 7 |
| CMEA | 190.4 | 95.2 | 13.4 | 6 |
| Bulgaria | 10.0 | 5.0 | 0.3 | 1 |
| Hungary | 65.0 | 32.5 | 5.2 | 1 |
| USSR | 115.4 | 57.7 | 7.9 | 4 |

continued

*Economic Commission for Europe data base on joint ventures.

Table 6 (continued)

| Region, country or area | Total (millions of koruny) | Statutory capital | | Joint ventures |
|------------------------------------|----------------------------------|-------------------------|--------------------------|-------------------|
| | | (millions of koruny) | (millions of dollars) | |
| Other countries or arrangements | 54.8 | 27.4 | 5.0 | 1 |
| China | 54.8 | 27.4 | 5.0 | 1 |
| Multi-party a/ | 98.3 | 42.6 | 2.8 | 3 |
| Total | 1 113.5 | 451.6 | 63.2 | 38 |

Source: Economic Commission for Europe data base on joint ventures.

a/ Joint ventures with foreign partners from two or more countries.

C. Distribution of joint ventures by sector and industry

The ECE data base provides a rather detailed industrial and sectoral breakdown for foreign direct investment in Hungary, Poland and the USSR. Given the smallness of the sample (38), such data is less useful for Czechoslovakia.

In all three countries, most joint ventures are concentrated in the manufacturing sector - 60.7 per cent, 65 per cent and 48.8 per cent for Hungary, Poland and the USSR, respectively. Those investments account for 35 per cent of the foreign capital in Hungary, 73 per cent in Poland, and 60 per cent in the USSR. Remaining joint venture activity is practically all accounted for by the service sector, as foreign direct investment in primary products is negligible in these countries.

Within the USSR manufacturing sector, in terms of the number of joint ventures, production of office equipment and computers represents the largest branch, with 15.5 per cent of total joint ventures, followed by non-electrical machinery and instrument engineering. The manufacture of chemicals, rubber and plastics accounts for 8.6 per cent of the total number of joint ventures in manufacturing, while food production accounts for 9 per cent of manufacturing joint ventures.

As may be seen from table 7, joint ventures in Poland are particularly prominent in the food industry (accounting for 19 per cent of the total in manufacturing), in metals, wood-processing and chemicals. Unlike in the USSR, joint ventures in wearing apparel are also important, accounting for 12.6 per cent of the total. In Hungary, within manufacturing, food production, communications equipment, non-metallic mineral products, office and computer

equipment and chemicals, respectively, hold the largest shares (see table 8). In all three countries, trade, hotels and restaurants, and business services represent considerable poles of attraction for joint ventures in the service sector.

Table 7. Manufacturing joint ventures in Poland,
by branches of industry, as of 1 June 1989

| Industry | Statutory capital | | | Joint ventures |
|--|----------------------------------|------------------------------------|-------------------------------------|----------------|
| | Total (millions of zlotys) | Foreign (millions of zlotys) | Foreign (millions of dollars) | |
| Food | 2 693.9 | 1 345.9 | 2.7 | 23 |
| Tobacco | 61.1 | 30.5 | -- | 1 |
| Textiles | 324.0 | 142.6 | 0.2 | 2 |
| Wearing apparel | 860.7 | 562.0 | 0.9 | 15 |
| Wood and wood products | 2 285.4 | 1 980.8 | 3.3 | 11 |
| Paper and paper products | 160.0 | 80.0 | 0.1 | 2 |
| Publishing and printing | 232.5 | 126.0 | 0.3 | 2 |
| Chemicals | 1 130.3 | 340.0 | 0.7 | 7 |
| Basic chemicals | 68.0 | 33.3 | 0.1 | 1 |
| Other chemicals | 1 062.3 | 306.6 | 0.6 | 6 |
| Cosmetics | 42.0 | 25.2 | 0.0 | 1 |
| Other | 1 020.3 | 281.4 | 0.6 | 5 |
| Rubber and plastics | 92.7 | 66.0 | 0.1 | 3 |
| Non-metallic products | 770.8 | 356.1 | 0.7 | 10 |
| Metal products | 4 465.1 | 1 217.4 | 2.5 | 12 |
| Machinery and equip- ment n.e.c. | 3 375.2 | 1 341.0 | 2.3 | 11 |
| General purpose machinery | 1 855.2 | 697.0 | 1.3 | 3 |
| Special purpose machinery | 1 520.0 | 644.1 | 1.1 | 8 |
| Agriculture and forestry machinery | 686.9 | 236.7 | 0.5 | 3 |
| Food-processing machines | 100.0 | 44.0 | 0.1 | 1 |
| Textile machinery | 48.0 | 25.0 | -- | 1 |
| Other | 685.0 | 338.5 | 0.5 | 3 |
| Office equipment and computers | 222.0 | 115.1 | 0.3 | 2 |

continued

Table 7 (continued)

| Industry | Total (millions of zlotys) | Statutory capital | | Joint ventures |
|--|----------------------------------|-------------------------|-------------------------------------|-------------------|
| | | (millions of zlotys) | Foreign (millions of dollars) | |
| Communication equipment | 293.6 | 89.7 | 0.2 | 3 |
| Television, radio transmitters | 96.4 | 36.6 | 0.1 | 1 |
| Other | 197.2 | 53.1 | 0.1 | 2 |
| Precision instruments | 206.1 | 118.0 | 0.2 | 2 |
| Motor vehicles | 200.0 | 80.0 | 0.2 | 1 |
| Other transport equipment | 3 503.7 | 772.7 | 1.1 | 3 |
| Furniture and manufacturing n.e.c. | 2 026.1 | 734.9 | 2.6 | 3 |
| Recycling | 2 252.5 | 949.3 | 2.3 | 6 |
| Total | 25 155.7 | 10 358.0 | 20.6 | 119 |

Source: Economic Commission for Europe data base on joint ventures.

Table 8. Manufacturing joint ventures in Hungary,
by branches of industry, as of 1 April 1989

| Industry | Total capital (millions of forint) | Foreign capital | | Joint ventures |
|-----------------------------|---|-------------------------|--------------------------|-------------------|
| | | (millions of forint) | (millions of dollars) | |
| Food | 1 464.5 | 4 535.8 | 11.5 | 10 |
| Textiles | 932.0 | 464.1 | 9.2 | 4 |
| Wearing apparel | 552.6 | 217.1 | 4.5 | 7 |
| Leather | 51.6 | 19.7 | 0.3 | 2 |
| Wood and wood products | 800.1 | 383.1 | 7.8 | 7 |
| Paper and paper products | 119.5 | 60.8 | 1.2 | 3 |
| Publishing and printing | 153.8 | 84.2 | 1.6 | 6 |
| Chemicals | 946.2 | 362.4 | 8.0 | 12 |

continued

Table 8 (continued)

| Industry | Total capital (millions of forint) | Foreign capital | | Joint ventures |
|--------------------------------|---------------------------------------|----------------------|-----------------------|----------------|
| | | (millions of forint) | (millions of dollars) | |
| Rubber and plastics | 82.7 | 36.0 | 0.8 | 3 |
| Non-metallic products | 1 088.3 | 498.1 | 10.2 | 7 |
| Basic metals | 21.4 | 10.7 | 0.2 | 2 |
| Metal products | 348.6 | 165.6 | 3.3 | 8 |
| Machinery and equipment n.e.c. | 524.2 | 244.5 | 5.4 | 13 |
| Office equipment and computers | 1 006.5 | 325.7 | 6.5 | 3 |
| Electrical equipment | 128.9 | 52.9 | 1.1 | 4 |
| Communication equipment | 1 294.4 | 439.1 | 8.7 | 5 |
| Precision instruments | 500.7 | 250.1 | 5.3 | 3 |
| Motor vehicles | 44.0 | 25.5 | 0.5 | 1 |
| Other transport equipment | 158.4 | 80.8 | 1.6 | 1 |
| Furniture | 191.4 | 81.0 | 1.6 | 4 |
| Recycling | 219.2 | 96.1 | 1.9 | 3 |
| Total | 10 619.1 | 4 433.2 | 92.2 | 108 |

Source: Economic Commission for Europe data base on joint ventures.

In the USSR, almost 15 per cent of the joint ventures (138) belong to the group of "other business activities", including services relating to engineering management, marketing, advertising, law and architecture. Seven per cent belong to the hotel and restaurant business, while 6 per cent are accounted for by computer-related activities.

In Poland, where joint ventures in services are less developed, about 8 per cent of foreign investments are in trade and 7 per cent in hotels and restaurants. In Hungary, in contrast, two branches of the service sector - financial services, on the one hand, and hotels and restaurants, on the other - attract 30 per cent and 18.3 per cent of total foreign capital, respectively.

III. POTENTIAL IMPACT ON DEVELOPING COUNTRIES

The following two basic questions can be raised concerning the impact on developing countries of the emergence of joint venture activity in European CMEA countries:

(a) Is the amount of foreign direct investment moving into the new markets of a significant scale?

(b) Is such investment actually or potentially replacing foreign direct investment in developing countries?

As regards the first question, it has been shown in the present study that the actual flows of foreign direct investment into European CMEA countries up to the end of 1989 have grown rapidly yet remained relatively small. It can be estimated that the total foreign component in the statutory capital of the 2,090 foreign investment projects in Czechoslovakia, Hungary, Poland and the USSR was (at current exchange rates) about \$2.2 billion as of 15 October 1989.* A comparison of that figure with the total stock of foreign direct investment flowing into Mexico in 1988, for instance, shows it to be less than 10 per cent of the \$21.9 billion registered by that single Latin American country.**

Nevertheless, in some specific industries foreign direct investment flows to European CMEA countries may become more significant in the future. The spate of deals that have taken place in the automobile industry (see table 9) is a case in point.

Table 9. Joint ventures announced by transnational corporations in the automobile industry

| Foreign corporation and country of origin | Country and joint-venture partner | Nature of deal and date |
|---|---|--|
| Renault (France) | Czechoslovakia (Bratislava Automobile Zavodi) | Local assembly of light commercial vehicles; January 1990 |
| General Motors (United States) | Hungary | \$100 million joint venture to build engines and assemble cars; January 1990 |
| Volkswagen (Germany, Federal Republic of) | German Democratic Republic | Production of small cars or light commercial vehicles; December 1989 |

continued

*Economic Commission for Europe data base on joint ventures.

**According to the Director-General of Foreign Investments of Mexico.

Table 9 (continued)

| Foreign corporation and country of origin | Country and joint-venture partner | Nature of deal and date |
|---|-----------------------------------|------------------------------|
| Suzuki (Japan) | Hungary | Small cars; December 1989 |
| Daihatsu (Japan) | Poland | Small cars; December 1989 |

Sources: Economic Commission for Europe and Centre on Transnational Corporations.

It is perhaps too early to speculate about the future course of foreign direct investment flows to those countries. However, even at the present stage, a number of salient points should be borne in mind. Despite liberalization in the investment codes of the countries concerned, notably in Hungary, Poland and the USSR, such measures alone probably still have not created an environment conducive to attracting more substantial inflows of foreign direct investment. To some extent, that is due to the still untried nature of the legislation. Despite the existence of new investment opportunities, foreign companies have tended to prefer the traditional joint-venture form of arrangement until the other options are tried and tested. Despite all the reforms that have taken place, joint-venture legislation still does not allow for the free and easy repatriation of profits. Alternatives to profit repatriation, like the taking-over of raw materials as a substitute for hard currency, are commonly practised in the case of joint ventures between Finnish and USSR firms. However, it is difficult to imagine how such arrangements could succeed in encouraging the scale of foreign direct investment inflow that the countries seem to wish and require. Thus, until more attractive investment régimes emerge, such flows will probably remain rather small. It can further be assumed that the overall institutional and infrastructural weaknesses will constitute bottle-necks once the first wave of foreign direct investment has occurred.

Concerning the question whether foreign direct investment flows to European CMEA countries are replacing investments that normally would have gone to developing countries, the upsurge of investment in the European CMEA countries is still too recent to have had a major impact. At the same time, if it could be established that certain investors who had favoured developing countries were now investing in the new markets, then clearly the potential impact could well be negative for the developing countries concerned. To answer that question would require knowledge about the country of origin and the motives of the investor and the industry in which the investment took place.

As was noted above, the main investors in European CMEA countries come from Western Europe, and particularly from the Federal Republic of Germany and Austria, for historical, linguistic and geographic reasons. Neither of those two countries are substantial investors in developing countries. While there has been a decline in the share of the Federal Republic of Germany in total OECD flows of foreign direct investment to developing countries, that decline dates from the 1970s, before the political and economic upheaval in the European CMEA countries began. Thus it would be erroneous to argue that the decline in investment flows to developing countries from the Federal Republic of Germany has been caused by increased activity in Eastern Europe. Moreover, the United States and Japan, ranking first and second, respectively, as foreign direct investors in developing countries, have not as yet figured largely in the establishment of joint ventures in European CMEA countries. Hence there is so far little evidence that countries with traditionally strong foreign direct investment in developing countries are now investing in European CMEA countries.

The evidence as to whether foreign direct investment in European CMEA countries is occurring in the same manufacturing industries as such investment in developing countries is rather inconclusive. Foreign direct investment in developing countries is spread rather widely, although in many cases the chemicals and electrical and electronics equipment industries are especially favoured. In European CMEA countries, foreign direct investment in the chemicals industry, especially in Hungary and the USSR, has been significant. In contrast, in no European CMEA country has the electrical and electronics equipment industry so far received a large share of foreign direct investment in manufacturing.

In the European CMEA region, machinery and equipment n.e.c. played a very substantial role in foreign direct investment, in terms of the number of joint ventures in manufacturing, ranking as the number one industry for such inflows in Hungary and Czechoslovakia, number two in the USSR and number four in Poland. Food and food products was another important area for foreign direct investment in the manufacturing sector of European CMEA countries, ranking number one in Poland and number three in both Hungary and the USSR.

There is a general tendency, however, for foreign direct investment to be concentrated in the low-technology, more mature industries in European CMEA countries, for which demand and expansion possibilities in the home countries of transnational corporations are rather limited. Developing countries, especially those with generally large markets, have attracted foreign direct investment of that kind. More specifically, transnational corporations in such mature industries as power generation and food-processing, driven by the need to increase their market share, have recently moved into developing countries. All things being equal, those corporations can likewise be expected to develop their businesses in European CMEA countries.

As regards the overall purpose of foreign direct investment in European CMEA countries, if new ventures were established as a

relatively cheap labour production site for export back to developed market economies, then such investment in certain developing countries could clearly be affected. But so far, the motive of most firms has been mainly to increase their market share within the European CMEA countries. A sizeable proportion of foreign direct investment is directed towards the production of consumer goods and services for the domestic market. However, there are exceptions. For example, investment by the Republic of Korea in Hungary is clearly aimed at using a cheap manufacturing base to export to markets in Western Europe, to which access is restricted from locations in the Republic of Korea, and where there are strong local content requirements for foreign direct investment from that country. The preferential access to the EEC enjoyed by Hungarian-based manufacturers is attractive to a foreign investor with the type of market access problems faced by firms from the Republic of Korea.

To sum up, it appears that at present foreign direct investment flows into European CMEA countries have hardly taken place at the expense of developing countries. To the extent that such investment is determined by attractive domestic markets, as in more highly industrialized or larger developing countries, the substitution effects will probably remain insignificant in the future. Moreover, there is so far no evidence that transnational corporations use European CMEA countries as major export platforms. Where foreign direct investment is actually undertaken to gain access to the EEC market, as in the case of some joint ventures in Hungary, geographic proximity is the key locational advantage. The example of investment by the Republic of Korea in Hungary, referred to above, shows that such investment can even work to the benefit of more highly industrialized developing countries. Those countries may further be able to take advantage of some of the substantial new investment opportunities created by the urgent need of European CMEA countries to modernize their economic infrastructure facilities and rehabilitate, upgrade and expand industrial production.

In the medium to long run, as exemplified by the economic reconstruction of Western Europe after the Second World War, the construction of new industrial capacities in the European CMEA countries and their integration into the global division of labour may be expected to provide a major stimulus to production and trade world-wide. The resulting benefits from the increased levels of exchange and specialization between Eastern European and other countries will partly accrue to developing countries.

SUB-CONTRACTING IN SMALL-SCALE INDUSTRIES:
THE CASE OF SRI LANKA

Sriyani Dias*

Introduction

Sub-contracting has been viewed by many as a necessary component of industrial development, particularly in small-scale industries. It is a mechanism for exploiting the benefits of comparative cost advantages arising out of specialization in economic activity. In sub-contracting systems, parts and components, or sometimes completed products, are made by sub-contractors in accordance with orders placed by contracting firms. The volume of sub-contracting relationships between small- and large-scale firms is usually increased through voluntary linkages in which each party finds it to its advantage to enter into a contractual arrangement and mutual confidence gradually develops.

A sub-contracting relationship exists when a person or firm (a contractor) places an order with another person or firm (a sub-contractor) for the production of parts, components or sub-assemblies (assemblies to be incorporated into products to be sold by the contractor). Such orders may include the processing, transformation or finalizing of materials or parts by the sub-contractor at the request of the contractor. Generally, a sub-contracting relationship emerges when a person or firm (a final seller) enters into a contract with an intermediary supplier of a final product or service in order to be able to sell the product or service; this is known as product procurement sub-contracting. When a final seller enters into a sub-contract with a supplier of semi-processed products or processed parts in order to be able to finish processing the products or assemble the parts into finished products for final sale, it is called product process sub-contracting. In all industrial economies, a vast number of small-scale enterprises supply a host of components, parts and services for large-scale enterprises, which, usually after further processing, market the finished products. In many developing countries in Asia, the sub-contracting system has gained momentum, due partly to the rapid growth of their economies, particularly in the machinery sector, and partly to the success of the Japanese sub-contracting system. These countries have come to recognize the significance of the sub-contracting system as an effective institution for promoting industrialization [1].

Sub-contracting relationships between large- and small-scale firms are beneficial to an economy because they spread the developmental effects of industrial growth over a wider geographical area and among a broader segment of the community and they promote more efficient use of existing capacity and resources. Sub-contracting

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enables large-scale firms to reduce production costs because of the low overhead and labour costs of small-scale enterprises and their willingness to cut profits. In addition, it provides large-scale firms with greater flexibility in responding to changes in demand, lower capital investments and a smaller permanent work-force, thus reducing their break-even points in production. It also enables large-scale firms to make use of the specialized equipment and skills of small-scale enterprises that the large-scale firms would not use often enough to justify their acquisition.

Sub-contracting enables small-scale firms to benefit from various kinds of assistance from a contracting firm. One of the main impediments to growth in small-scale industries is lack of assured market outlets for their products. This problem is, to a great extent, solved by the sub-contracting system. Small-scale enterprises may also benefit from a variety of services from the contracting firm, such as technical assistance in product design and quality control, and help in overcoming production problems and in ensuring a steady supply of raw materials. A good relationship between the sub-contractor and the contractor may help the sub-contractor to obtain, among other things, credit.

The present article provides a discussion of the scale, nature and the effects of current sub-contracting linkages in Sri Lanka. Particular attention is given to the problems of developing an effective sub-contracting system in the country. The relationship between the nature of firms and sub-contracting linkages is also examined. Services rendered by the Sub-contracting Exchange are discussed and suggestions are made on how they may be utilized more effectively.

A. Method

The information and data provided in the present article were obtained from, among other things, various government and non-governmental organizations. Additionally, interviews were held with government and non-governmental officials and a survey of entrepreneurs was conducted. The textile and wearing apparel industry and the fabricated metal product industry were selected for the survey for two main reasons: first, sub-contracting linkages are likely to be of considerable significance to small-scale firms in those industries; secondly, those industries account for 30 per cent of the total value of industrial production in Sri Lanka. Moreover, in recent years, they have been given high priority in programmes for developing manufacturing activities.

A sample consisting of 150 enterprises was selected from the Colombo, Gampaha, Kalutara, Kandy and Kurunegala districts. Those districts were chosen largely because of the concentration of textile and metalworking industries in them. Because of financial and time constraints, the sample was relatively small. The enterprises in the sample were stratified by type of industry, structural characteristics and location in order to reflect as far as possible the small-scale enterprises in the country. Ninety-three light engineering firms were selected from the product-oriented metalworking industries (e.g. manufacture of spare parts and agricultural

implements), the service-oriented metalworking industries (e.g. welding, electroplating, machine assembly and brasswork) and blacksmith units. Fifty-seven textile manufacturing firms were selected from the powerloom industry and the made-up garment manufacturing industry. The questionnaire used for the survey was a modified version of one used for a pilot survey.

B. Sub-contracting linkages

The sub-contracting system, which is a way of boosting inter-industry demand for products and services of small-scale industries, does not seem to be adequately developed in Sri Lanka. It was expected that small-scale firms would contribute to an overall strategy of export-led growth, mainly as sub-contractors to large exporting firms.

Large-scale firms in export-processing zones and joint ventures with foreign firms, however, lack effective linkage with local firms, mainly because of the tariff-free import of raw materials, parts and components. Linkages of enterprises in export-processing zones with local small-scale industries have also been hindered as a result of the low level of industrialization in the country and the very nature of import-based manufacturing processes. The potential forward linkages are minimal as such enterprises are generally engaged in production for export. Due to factors such as guaranteed prices, good quality and reliable delivery, manufacturers in export-processing zones are more inclined to import raw materials direct from overseas. Moreover, since most developed countries do not charge import duties on re-imported materials incorporated into finished products, enterprises in export-processing zones tend to use more imported inputs [2]. Nevertheless, enterprises in export-processing zones have created some linkages with local industries, which supply them with intermediate goods, raw materials and services; for example, such enterprises obtain a great deal of their packing material requirements from local industries. The capability of the Sri Lankan packaging subsector has improved and production has expanded over the past 10 years; as a result, it is capable of meeting about 60 per cent of the requirements of enterprises in export-processing zones. Furthermore, enterprises that produce wearing apparel obtain buttons, zippers, fabric etc. from local sources. Some use parts produced by contractors outside the export-processing zones. In addition to sub-contracting and supplying materials, there are linkages in such areas as management, accounting and consulting.

An export production village programme was started by the Export Development Board in 1981 with the aim of linking rural producers with export markets. The operational unit of the export production village is a company that supplies products to established exporters. Shares in the company are purchased by villagers; the Export Development Board also buys shares to ensure adequate working capital at the inception of the programme. The Export Development Board links the company with exporters and negotiations are conducted between the exporting firm or firms and the company regarding prices, quantity and quality of exports. The first export production village was established at Dambadeniya in

the North Western Province in 1981; 32 export production villages were registered and 18 were reported to be operational by the end of 1988. It is difficult to evaluate the linkage patterns that exist between rural producers and exporters without conducting a detailed study. Empirical evidence, however, indicates that the village producers have been more successful as sub-contractors in the following areas:

(a) Agricultural products, such as vegetables, fruits, spices and flowers;

(b) Agro-based industries, such as those processing white fibre and cashews;

(c) Manufactured and assembled goods, such as electronic components and umbrellas.

Many rural small-scale producers have joined the programme and, as a result, sub-contracting relationships between exporters and small-scale producers have to a certain extent increased.

There are two other types of sub-contracting linkages in Sri Lanka: (a) sub-contracting by large- and medium-scale industrial enterprises to small-scale industries; and (b) the organization of small- and medium-scale industries on what might be termed a household basis, as in the garment industry, whereby there is little or no involvement of the contracting organization in production or it is involved in only the final phase of production, often only final finishing and packing. In the latter type of linkage the contracting organization confines itself to procuring and supplying raw materials and equipment (obtaining advantages of scale), management and marketing. It solicits orders from buyers, enters into contracts with them and takes responsibility for the supply of goods in terms of the quantities, quality and delivery dates. Most if not all of the production is done by small-scale producers [3].

Linkages between organized large-scale industries and small-scale producers can be seen in the food-processing, footwear and wood product industries. In the period 1982-1983, the Government allowed a large-scale enterprise to develop the dairy industry in the districts of Anuradhapura, Kurunegala and Puttalam. As a result, the total number of milk producers in rural areas increased from 510 in 1984 to 7,009 in 1988. In 1989, the enterprise was also allowed to develop the dairy industry in the district of Kandy.

A large shoe company has relied on sub-contracting for stitching uppers, screen-printing uppers and insoles, trimming soft uppers, covering insoles, folding components and manufacturing shapes, straps and finished shoes. Seventy-nine sub-contractors and approximately 1,300 people are involved in the operation.

The production of wooden items for export is another area where sub-contracting relationships have been developed. An export company that began production in 1976 has introduced sub-contracting in such areas as cutting, painting, carving and producing items made of

paper mâché, raw materials and wooden accessories. Sub-contractors are given assistance in the form of raw materials or financing [4].

Few large-scale firms have had much success as contractors. Only 9 per cent of the firms in a recent sample survey [5] were engaged in sub-contracting activities. About 2 per cent of the metalworking firms were primary sub-contracting firms, having continuous sub-contracting relationships with large-scale manufacturing firms. Sixteen per cent of the textile firms were very often engaged in sub-contracting activities (see table).

Sub-contracting activities among metalworking and textile firms, 1989
(Percentage)

| Frequency | Metalworking firms | | Textile firms | |
|------------|--------------------|--------------------------------|---------------|--------------------------------|
| | Number | Share of total number of firms | Number | Share of total number of firms |
| Never | 48 | 51 | 29 | 51 |
| Rarely | 13 | 14 | 4 | 7 |
| Sometimes | 21 | 23 | 9 | 16 |
| Often | 9 | 10 | 6 | 10 |
| Very often | 2 | 2 | 9 | 16 |
| Total | 93 | 100 | 57 | 100 |

Source: Sriyani Dias, "Linkage effects of small- and medium-scale industries: a study of light engineering and textile manufacturing industries in Sri Lanka", report prepared for the Natural Resources, Energy and Science Authority of Sri Lanka, 1989.

As shown in the table, approximately 50 per cent of the metalworking and textile firms in the sample survey reported ever being engaged in sub-contracting activities. Continuous relationships between large- and small-scale enterprises, however, were much less common. The number of contractors was also small; for example, five metalworking firms and three textile producers reported that they worked very often as contractors, providing both material and know-how to sub-contractors.

C. Problems and constraints

The low number of relationships between sub-contractors and contractors may be due to several reasons. During the survey, entrepreneurs were asked to state their reasons for not undertaking any sub-contracting work. Among the main reasons given was the inability of small-scale firms to satisfy quality standards or meet delivery schedules. Failure to meet delivery schedules can often be traced to working capital constraints; and inadequate quality con-

trol is often the result of small-scale firms not having enough capital for technological upgrading. The fact that imported materials could be obtained easily was another reason that large-scale buyers chose not to acquire their supplies from local sub-contractors with limited technological capabilities and financial resources.

Small-scale entrepreneurs often did not regard sub-contracting as an opportunity to grow and become strong and were only interested in short-term gains. Some sub-contractors cited payment delays by the contracting firm as being one of the main problems with which they were faced.

Soliciting and obtaining customer orders posed another problem. Thirty per cent of the entrepreneurs in the survey stated that they were not getting adequate sub-contracting orders. Public sector buyers (the public sector contains a sizeable proportion of large-scale industrial and service enterprises) have often cited problems related to tender procedures and delays in payment for completed orders. There seems to have been some erosion of public confidence in tender procedures and awards. These are some of the problems that the Government needs to solve as soon as possible if a greater proportion of the public sector demand for goods and services is to be channelled to small- and medium-scale industries and if the development of a more effective sub-contracting system is to be facilitated.

A few entrepreneurs stated that changes in production activity posed a problem for them. Modernization and changes in the production activity of contracting firms are likely to result in a new pattern of requirements for sub-contractors. That may create serious problems, as sub-contractors cannot quickly switch over to new lines of production. Because contracting firms often need to supply technically advanced parts and components, the poor quality of components and parts manufactured by sub-contractors is a major constraint in developing an effective linkage between industries. Local manufacturers of spare motor parts cannot compete with the price of imports except by producing parts that are even more inferior in quality. Unless an environment conducive to the development and maintenance of satisfactory quality standards is created, the problem of quality will remain a major impediment to the growth of the sub-contracting system.

D. Nature of firms and sub-contracting linkages

Firms producing mainly construction equipment and parts and industrial, agricultural and transport equipment engaged heavily in sub-contracting activities, while firms producing mainly kitchen equipment or parts, moulds and dies were less engaged in such activities. No relationship was observed between the number of employees and the amount of sub-contracting work undertaken in the textile industries; both very small textile firms, i.e. those having fewer than five employees, and relatively larger ones, i.e. those with 100-199 employees, recorded having been engaged in sub-contracting activities. Metalworking firms with fewer than 10 employees tended

to be more actively engaged in sub-contracting activities than firms with more than 10 employees.

In both the textile industry and the metalworking industry, there was no relationship between the age of a firm and the extent to which it was engaged in sub-contracting work. The legal status of a firm was indirectly related to engagement in sub-contracting activities. There was a high incidence of sub-contracting activities among individually owned firms, while firms with limited liability were not engaged in any sub-contracting. Registered firms had often had such relationships in both types of industries.

E. Sub-contracting Exchange

In order to provide linkages between buyer firms and small- and medium-scale industries sub-contractors on the improvement and enhancement of technical and management performance among sub-contractors, the Sub-contracting Exchange was established in 1981 under a project financed by the World Bank. The objectives of the Exchange are as follows:

(a) To assist small- and medium-scale industries in gaining knowledge of potential public procurement or private orders;

(b) To communicate to large-scale enterprises the production capabilities of potential sub-contractors in small- and medium-scale industries;

(c) To assist small- and medium-scale industries in meeting quality standards and delivery schedules.

In addition, the Exchange also assists in setting up new enterprises capable of operating as sub-contractors for specific products. The Exchange is expected to act as a catalyst, facilitating the modernization of quality improvement and the improvement of technical and management performance and providing effective linkages between buyer firms and industrialists. It is also expected to facilitate financing and gradually provide liaison services for public and private institutions in order to foster the development of the sub-contracting system and growth in small- and medium-scale ancillary industries.

The activities conducted by the Exchange include analysing the requirements of large institutions and identifying potential products to be manufactured by small- and medium-scale industries. The Exchange carries out promotional and marketing activities through direct contact with potential customers. Customers are often found by examining tenders issued by procuring organizations. In procuring orders, however, the Exchange does not always receive the complete co-operation of buying departments. For instance, the Exchange sometimes receives notices inviting tenders only a few days prior to the closing date for tenders, thus making it impossible for it to obtain bids from interested small- and medium-scale industries. Although the Exchange is a State-sponsored organization, it does not generally receive preferential treatment from procuring government agencies as some organizations, such as State-

sponsored trading institutions, do. Such institutions do not actually manufacture the products allocated to them but only function as intermediaries and by farming out their orders to private manufacturers, undermine the scope and strength of operation of the Exchange.

According to an evaluation report on small-scale and rural industries, the Exchange has not proved effective in executing its functions [6]. Large-scale buyers do not seem to be particularly keen on operating through the Exchange. They prefer to deal directly with known and trusted suppliers. The information supplied by buyers to the Exchange often falls short of the specifications required by a potential supplier. As a result, in most cases, the Exchange has merely kept suppliers informed of potential buyers, helping them to establish direct contact with each other rather than processing orders through its own offices.

Instead of smoothing things out between buyers and suppliers encountering problems in establishing sub-contracting relationships, the Exchange is often dragged into controversies and may even inadvertently reinforce the view that sub-contracting to small-scale industries is not practicable because of their limited capabilities [6].

In 1984, a committee composed of both public and private sector officials was appointed by the Ministry of Rural Industrial Development to examine the effectiveness of the Exchange. In its report [7], the committee concluded that the activities of the Exchange had been limited mainly because of the lack of managerial and technical capabilities of small-scale firms, which, in turn, resulted in their being unable to meet quality standards and delivery schedules. The Exchange also lacked the authority to fully explore the possibilities for sub-contracting and to arrange for the implementation of sub-contracting contacts. The committee also concluded that the Exchange would be able to fulfil its functions successfully only if its authority were broadened and its staff strengthened. In addition, the assistance provided by the Exchange would have to be complemented by assistance in finance, technology and management, which could be provided by organizations that had developed competence in their areas of operation.

According to a recent survey [8], only six out of a total sample of 226 rural firms had heard of the Exchange, though those six had all made use of its services. Another nine firms had entered into sub-contracting relationships with other private enterprises on their own. Of the semi-urban firms in the sample, only one had heard about and had made use of the Exchange; another had entered into sub-contracting relationships with other private enterprises. Only two entrepreneurs had made use of the facility. In both urban and rural areas, a large number of entrepreneurs were not aware of the Exchange and its activities.

F. Conclusions

There is overwhelming evidence that the sub-contracting system in Sri Lanka has not been adequately developed, for various reasons,

including social and financial ones. The main reason, however, is the inability of small-scale industries to meet the requirements of large-scale industries, in terms of the level of technology, production cost, quality and delivery. If small-scale industries have nothing to offer in these areas to large-scale industries, they will never receive sufficient sub-contracting orders. Thus, the managerial, technological and financial capabilities of small-scale industries need to be improved and modernized.

In order to develop an effective sub-contracting system, government policy and support programmes for developing and promoting inter-industry linkages are needed. The Janasaviya Programme, which was launched by the Government to alleviate poverty, has highlighted the importance of the sub-contracting system in setting up small production units at the village level that are linked to large units. The implementation of the Programme is likely to create new demand for links between organized buyers in the manufacturing and public sectors, on the one hand, and existing and emerging rural industries, both formal and informal, on the other. Sub-contractors could be directly linked to the following types of large organizations:

(a) Manufacturing industries, organizations involved in the production and manufacture of finished products; they could purchase components, packing materials and other items required for manufacture or assembly;

(b) Export houses, organizations that have a ready export market for various industrial and agricultural products and services;

(c) Trade or marketing houses, organizations mainly involved in local trading and marketing activities.

There are many advantages to linking small sub-contractors to larger organizations:

(a) Large organizations could identify products or items to be supplied by sub-contractors;

(b) The training and assistance required in establishing sub-contractors could be provided by large organizations;

(c) The supply of raw materials could be ensured and the quality of raw materials could be controlled;

(d) Quality control standards could be set;

(e) Large organizations could buy back items manufactured by the sub-contractors, thus providing a market;

(f) Large organizations could arrange to deduct loan instalments and repay banks using money released on the purchase of products from the sub-contractors;

(g) The sub-contractors would be able to concentrate on production activities as the contractors would be responsible for all other matters..

Some of the small-scale industries that are likely to receive priority attention in the course of the Janasaviya Programme are agro-based industries that utilize locally available (a) raw materials, such as coconut and coir (coconut-husk fibre) products, charcoal, jaggery (brown palm-sap sugar), gums, timber products, rattan products, spare parts for tractors and bicycles, construction materials, ploughs and carts; and (b) capabilities, such as oil extraction, food processing, scientific drying (of cassava, copra, paddy etc.), tailoring, grinding mills, repair works, tractor servicing, and brick-making.

However attractive sub-contracting may appear to the national economy, it would be unrealistic to expect that it will spread far enough or fast enough without some imaginative promotion by well-equipped and motivated organizations. Most small-scale enterprises are not able to develop linkage patterns without institutional support.

There are a large number of public and private sector organizations that are involved in developing and promoting the linkage patterns of small-scale enterprises. These include the Industrial Development Board of Ceylon, the Department of Small Industries, the National Institute of Business Management, the Ceylon Institute for Scientific and Industrial Research, the National Engineering Research and Development Centre, the Sri Lanka Standards Institute, the National Apprenticeship Board, the National Youth Services Council and the Ministry of Labour. Their activities, however, tend to overlap. The support provided by them could be improved if they co-ordinated their activities. In the report of the committee appointed by the Minister of Rural Industrial Development to examine the services rendered by the Sub-contracting Exchange [7], it was also pointed out that there was a lack of co-ordination between the Exchange and public and private sector organizations. Small-scale entrepreneurs generally do not readily avail themselves of the services of these organizations, partly because many of them are unaware of the existence of such services and partly because of their preoccupation with aspects of their daily work such as management, production organization and gaining access to financial resources.

There are a number of ways to promote the relationship between small-scale enterprises, large-scale enterprises, other institutions and the Industrial Development Board of Ceylon, including the following:

(a) Small-scale entrepreneurs could be better informed of the requirements of medium- and large-scale enterprises and public sector organizations: the items required, their specifications, the quality expected, quantities, delivery dates etc.;

(b) Information on the capabilities and the capacities of small-scale enterprises could be made more readily available to

medium- and large-scale entrepreneurs and public sector organizations;

(c) Trust between all parties could be improved;

(d) Efforts could be made to increase the awareness of the role of the Exchange as an honest, efficient broker promoting small-scale industries and, where necessary, helping them with the expertise at its disposal. A detailed survey could be conducted of items required by medium- and large-scale industries and public sector organizations, such as the Sri Lanka Central Transport Board and Sri Lanka Railways, that could be manufactured by small-scale enterprises. Co-operation between the Exchange and public and private sector organizations could be increased. Government departments, corporations and statutory bodies could bring their requirements to the attention of the Exchange.

Government regulations and procedures for starting up small units should be made simple, and suitable incentives should be given for starting up small units to undertake sub-contracting work. Fiscal and other incentives to contracting and sub-contracting firms could lead to improved relationships between them. Financial incentives could be granted to both large and small units for undertaking promotional and developmental work exclusively for the sub-contracting sector. Banks could adopt the following methods for funding sub-contractors:

(a) Banks could lend money:

(i) To the larger organization, which in turn would disburse the money to the sub-contractors;

(ii) Directly to the sub-contractors, provided the project is viable and has a direct link with the larger organization, which is committed to providing the necessary technical expertise and upholding its end of a buy-back agreement;

(b) Banks could provide additional funds to large organizations to provide working-capital financing, e.g. for purchasing raw materials and finished goods from sub-contractors.

Apart from financial incentives, a strong package of support services could be provided to sub-contracting firms. Such services might include the following:

(a) Technical advisory services provided by qualified staff covering all facets of production, such as layout, material handling, process details, tooling, testing and quality control;

(b) Common facility services, including costly machinery provided at central points to be utilized by sub-contracting units;

(c) Free import of raw materials and parts and components for sub-contractors;

(d) Provision of testing facilities for raw materials and finished products.

The Exchange has been primarily concerned with relationships between big industry and small- and medium-scale industries and not between small- and medium-scale industries and household producers. The Ministry of Textile Industries and the Ministry of Rural Industrial Development have been utilizing private sector marketing and management expertise to strengthen the Exchange. Small- and medium-scale industries would eventually be promoted by a programme supporting participation in public sector procurement. Such procurement should be made through the Exchange. A centralized organization such as the Exchange may be appropriate for large-scale industries, which are mostly located in the Colombo area. For the small- and medium-scale industries and household producers envisaged in the Janasaviya Programme, however, an institution with a highly decentralized operational capability is required. The Government could use the nine regional offices of the Industrial Development Board of Ceylon to serve as initial locations for decentralized exchanges that would facilitate sub-contracting by obtaining assistance in training, management and entrepreneurial development, quality control, prototype and sample testing, research and development, market identification and financing.

In developing an effective sub-contracting system, entrepreneurial development should receive priority. Suitable personnel should be chosen and trained. Entrepreneurial development programmes being conducted by several organizations could provide in-plant training for small-scale entrepreneurs and develop management capabilities in such areas as marketing, financing, production and personnel management, depending on their needs. Public sector organizations such as the National Institute of Business Management, the Industrial Development Board of Ceylon and the Central Bank of Sri Lanka could periodically offer theoretical and practical management training courses for those participating in the scheme to develop ancillary industries. The courses could take into consideration the needs of the participants in such areas as marketing, production and personnel management.

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THE CAPITAL GOODS SECTOR IN GHANA: OPTIONS FOR ECONOMIC
AND TECHNOLOGICAL DEVELOPMENT*

Erik Baark

A. The role of the capital goods sector in national
economic development

The role of capital goods in the industrialization process, and more broadly conceived, in the process of development, can be seen in two "mainstream" perspectives [1]. On the one hand, there has been an approach that focuses on the role of capital goods in economic growth. This growth-oriented approach has emphasized capital accumulation and the impact of sectoral resource allocations. On the other hand, there exists an innovation-oriented approach, which underscores the importance of capital goods as carriers of technological change. In a sense, this latter perspective is concerned with the accumulation of technological capabilities and linkages between core sectors of the economy and the rest of society.

The growth-oriented approaches can be traced to Marx's concepts of the key role played by the production of specialized machinery. They were further elaborated by economists concerned with the achievement of rapid economic growth. The most influential of these approaches were the unbalanced accumulation growth models developed by the Soviet economist G. A. Feldman [2] and the Indian planner P. C. Mahalanobis [3]. Later extensions of these models formulated by K. N. Raj and A. K. Sen [4] and Charles Cooper [5] have provided more sophisticated conceptual analyses; but the basic message remains the same: that investment in the capital goods sector yields superior economic growth in the long run.

The growth-oriented approaches do not, however, illustrate the qualitative significance of technologies embodied in capital goods and the impact of their diffusion in the economy. The theoretical insights provided by the capital accumulation models should therefore be extended to take into account the role of technological

*The author collected background material for the present paper while on assignment as consultant for the United Nations Development Programme/Technology Transfer Centre project "Strengthening the National Capacity for the Transfer, Utilization and Development of Technology", in Ghana, May-June 1989. The author is grateful to M.N.B. Ayiku, Co-ordinator of the Technology Transfer Centre at the Council for Scientific and Industrial Research, Accra, for the support received; to the local expert A. Twum, who collected most of the data and gave important insights into the sector; and to G. Frempong and S. Atadja, who provided assistance in interviews and data-collection. Opinions expressed in the present paper are, however, the personal responsibility of the author and do not represent the viewpoints of any of the above-mentioned persons or institutions.

capabilities. Elsewhere, the author has proposed to designate this theoretical perspective the "Technology Accumulation Model", to underscore both the dynamic effects of capital goods innovations at the macro-economic level and the learning requirements that become manifest at the micro-economic level [6].

The position of the capital goods sector in a national innovation system makes it a key instrument of generation and diffusion of new technological capabilities. Capital goods are the carriers of embodied technology in other sectors of the economy. This vital aspect has been emphasized in a series of recent studies relating to technology flows in industrial market economies. It has been shown that such flows are vital to productivity growth throughout the economy. Moreover, the accumulation of skills and knowledge in the production and application of capital goods is vital to the maintenance of linkages that tie modern economic systems together in a technological infrastructure.

In the context of developing countries, however, the implication of such a perspective is to find the means to gradually accumulate and diffuse technological capabilities in key areas of the economy. Selective, but sustained, development of a specialized capital goods sector linked to important markets in the economy must be seen as a pre-condition for continued economic development.

The establishment of sustainable capital goods industries may thus be conceived of in three progressive stages of accumulation of technological capabilities, each with its own problems and main objectives, as illustrated in figure 1. In the first stage, developing countries have aimed at acquiring indigenous production capabilities in the consumer goods sector, thereby reducing dependence on imports of manufactures, a dependence often inherited from the distorted economic structure of a colonial past. Nevertheless, in order to achieve these capabilities, it is necessary to import whole sets of production equipment, including capital goods and other technologies such as organizational know-how and skills.

In the second stage, the problem of dependence on outside sources for production equipment still exists. This stage is accordingly characterized by an attempt to establish basic capabilities for production of the capital goods, particularly for high-priority sectors and consumer goods industries. In other words, the country would promote imports of technologies for the indigenous production of capital goods.

The capability to produce capital goods locally in developing countries ultimately depends on the creation of indigenous know-how, that is, the capability to design and modify advanced capital goods. A third stage of capability development is thus aimed at reducing dependence on foreign know-how through the creation of capabilities for technological innovation.

These stages of progressive development of indigenous technological capabilities also illustrate the changing function of capital goods industries. In the first stage, a local capital goods

industry hardly exists and would usually serve small niche markets, since the major part of production equipment is supplied by foreign firms or development-aid donors. The diffusion of capital goods in this stage merely represents a relocation of production to the developing countries.

Figure I. Three stages of technology capability development in indigenous capital goods industry

| Stage | Problem | Objective | Policy measures |
|-------|--|--|--|
| I. | Dependence on imports of nearly all manufactured goods | Development of indigenous capability to produce most consumer goods | Restriction of consumer goods imports. Imports of capital goods for domestic consumer goods industries |
| II. | Dependence on imports of capital goods for the consumer goods sectors. Promotion of industries | Development of indigenous capabilities for the production of capital goods for priority sectors | Restriction of capital goods imports in selected sectors. Promotion of imports of technologies for domestic capital goods industries. Development of local technological linkages |
| III. | Dependence on imports of advanced technology for production of capital goods | Development of sustainable capital goods industries on the basis of indigenously developed designs | Restriction of foreign technology imports. Promotion of indigenous technological capabilities in the local R and D system and capital goods industry. Promotion of capital goods exports |

Experience shows that direct imports of capital goods seldom contribute to the creation of a local capital goods industry. In fact, it is more likely that such imports impede the growth of such industrial sectors. Nor do they usually bring much in terms of development of indigenous technological capability, which is essential to the long-term viability of a local capital goods industry. This is why, in the second stage, the primary goal is to build up capabilities to assimilate and even modify imported technologies.

The local capital goods industry may still be in a state of dependence and precarious existence. A true position of independence is only acquired in the third stage, when self-propelled innovation takes place inside the country.

The implication of this sequence of development stages for small and relatively poor countries, such as Ghana, is that industrial policies should provide support for a national capital goods industry supplying priority areas. The primary goal should be to emerge from the dependent stage one to reach stage two. Steps should also be taken to develop capabilities at stage three in specialized areas.

As a general strategy for economic development, import substitution came in for severe criticism during the 1980s. Institutions highly influential on Ghana's current economic policy, such as the World Bank, have supported the view that conventional forms of tariff protection or restrictive practices are detrimental to the establishment of competitive industries in developing countries, favouring instead what has been termed outward orientation to the global economy [7]. Arguments in favour of selective protection persist, however, particularly in relation to emerging indigenous technological capabilities [8]. Special support for infant industries in the capital goods sector appears to have been of fundamental importance in the strategies of newly industrialized countries [9]. The essence of such support has been to encourage the learning process and to supply a reasonable amount of infrastructure for relevant firms.

There is, in other words, a need for policies and special support mechanisms that would provide sufficient incentives to local entrepreneurs in the capital goods sector. Such support mechanisms can usefully be conceived in relation to three components of a national capital goods industry system: inputs, outputs and decision-making [10]. Figure II below provides an overview of support mechanisms particularly relevant to a country such as Ghana.

Figure II. Support mechanisms for indigenous capital goods production

| Developmental support | Decision-making | Regulation |
|---------------------------------|------------------------------------|--|
| Special financing arrangements | Continuous monitoring mechanism | Selective, temporary import restrictions |
| Supply of raw materials | Identification of priority sectors | Regulation of technology transfer |
| Training of manpower | | |
| Introduction of improved design | | |
| Public procurement | | |

These ideas about support mechanisms will be used as a framework for discussing the options for promotion of the Ghanaian capital goods industry later in this paper. What is argued here is that a set of new initiatives aimed at trying to remove the bottlenecks that have existed for some time now for the industry will be more efficient than simply leaving the sector to ad hoc development.

B. Industrial policy in Ghana

The industrial policy of Ghana can be broadly reviewed in two major periods. The first may be termed the Nkrumah heritage and broadly covers the time from Independence in 1957 to the economic crisis in the early 1980s. The second period is characterized by the Economic Recovery Programme, which was initiated in 1983. The data given in this paper cover only the early years of this programme.

The framework for an economic and industrial policy was formulated in the early 1960s, in connection with the seven-year plan adopted by the Nkrumah Government [11]. The emphasis in this plan on rapid industrialization based on both domestic capital and joint ventures with foreign companies gave an impetus to the establishment of capital goods industries involving both public and private investment [12]. Initially, this policy achieved some success as the manufacturing sector grew in the 1970s and led to rapid expansion of employment. In the 1970s, however, problems of capacity underutilization, dependence on imported raw materials, and a declining rate of productivity led to stagnation and progressive decline in most industrial sectors.

The Economic Recovery Programme pursued by the Government involved an exchange rate adjustment (the cedi was devalued drastically), which became a virtual shock for the economy, raised producer prices for important export items such as cocoa and liberalized trade restrictions. The industrial sector was to benefit explicitly from rehabilitation programmes in key sectors that were aimed at improving management and ensuring adequate inputs and capital equipment. In terms of its immediate objectives, the Economic Recovery Programme has performed rather well, particularly since the programme was supported by substantial external financial resources transfers, primarily from the International Monetary Fund and the World Bank. Recent gross domestic product growth rates have been around 5 per cent per annum. But in terms of overall performance, the programme still suffers from a host of political and social problems that tend to accentuate the difficulties of creating a viable climate for economic growth [13].

Industrial policy was more explicitly formulated in the mid-1980s, as the need emerged for measures to follow up the process of structural adjustment based on the Economic Recovery Programme. The aims of this industrial policy were as follows:

- (a) To increase output through greater use of existing installed capacity;

(b) To improve supplies of essential goods (food, textiles, machetes, cutlasses etc.);

(c) To remove production bottle-necks and achieve significant cost reduction through selective rehabilitation;

(d) To develop economically viable linkages both among local industries and among key economic sectors;

(e) To raise export earnings of non-traditional manufactured goods.

The weakness of the financial and institutional framework for implementation of this policy has remained an obstacle to current growth of the sector. An attempt was made to improve access to credit facilities through reduction of the minimum cash ratio of primary banks. Furthermore, ceilings on credit to most sectors were revised upward to accommodate the expected increase in demand for credit under the 1983 import programme. In 1985, a total of 3.9 million United States dollars (\$) and 1.3 million pounds (£) was allocated to the capital goods sector for importation of essential raw materials, spare parts and other inputs by both the public and the private sectors. In 1986, a total of \$280,000 and £1 million was released to the sector.

A foreign-exchange auction system administered by the Bank of Ghana was introduced in 1986 to remove the bottle-necks associated with the allocation of foreign exchange through import licence systems. However, there are important side-effects of the new auction system. For example, repayment of foreign loans and credits has become increasingly difficult. The foreign-exchange auction system has clearly raised the cost of imported raw materials, and this has given rise to an overall increase in the cost of production for many capital goods.

In order to promote foreign investment in Ghana, the Government passed a law in 1985 that identified priority areas and provided for special benefits and incentives specified in the investment code. Special incentives were provided to (a) manufacturing industries that manufacture for export; (b) manufacturing industries that predominantly use local raw materials; and (c) manufacturing industries that produce agricultural equipment, spare parts and machine tools. The benefits and incentives were:

(a) Requisite permission for importing essential machinery and equipment required for the enterprise;

(b) Exemption from the payment of customs import duties in respect of plants, machinery, equipment and accessories imported specifically and exclusively to establish the enterprise once approved;

(c) Investment allowance of 7.5 per cent;

(d) Depreciation or capital allowance of 40 per cent in the year of investment and 20 per cent in subsequent years.

The Ghana Investment Centre was established for the purpose of regulating this investment. In 1986, the Centre approved a total of 117 new manufacturing enterprises to be established in the country. Only 13 contracts with foreign investment were approved in the capital goods sector. Twelve of these were in the metal manufacturing subsector. The industrial policy in Ghana has thus only been able to provide a limited amount of concrete support to the capital goods sector.

C. The formal sector of Ghana's capital goods industry

The core capital goods sector in Ghana was established under import substitution policies. Economic stagnation since the 1970s provided little room for expansion and during the 1980s, the formal sector of medium-sized firms has even witnessed a dramatic recession. The nature and extent of the crisis differs from one subsector to the next, but the overall picture has been dismal. In order to provide a background to discuss possible remedies, an attempt is made here to delineate the position of the capital goods industry in Ghana, its structure and the dominant patterns of production.

Official figures are provided in table 1 for the formal sector, the relatively large firms (by Ghanaian standards) registered as engaged in capital goods production for selected years. These figures indicate that there had been a decline in the number of large establishments during the 1970s, but that the figure was constant (approximately 50 units) during the 1980s.

Table 1. Number of establishments a/ in the capital goods sector, 1973, 1977 and 1981-1985

| Year | Categories (ISIC) | | | | |
|---------|----------------------|--------------------------------|----------------------------|---------------------------|---|
| | Metal products (381) | Non electrical machinery (382) | Electrical machinery (383) | Transport equipment (384) | Scientific and professional equipment (385) |
| 1973 | 38 | 2 | 27 | 22 | .. |
| 1977 | 26 | 1 | 9 | 13 | .. |
| 1981 | 30 | 2 | 10 | 9 | 3 |
| 1982 | 29 | 2 | 11 | 9 | 3 |
| 1983 | 24 | 1 | 11 | 11 | 3 |
| 1984 b/ | 24 | 1 | 9 | 10 | 5 |
| 1985 b/ | 24 | 1 | 11 | 13 | 5 |

Source: Statistical Service, Accra.

a/ Employing a minimum of 30 persons.

b/ Figures provisional.

Official data thus suggest that six large firms from the sub-sector manufacturing metal products closed down during the 1980s. At the same time, four new firms were being set up in the subsector of transport equipment and two new large firms in the scientific and professional equipment subsector. Surprisingly, since 1983, only one large firm has been identified by the Statistical Service in the non-electrical machinery industry, which includes firms producing agricultural machinery.

The entry of six new firms into the transport subsector and the scientific instruments subsector appears to have had a direct detrimental effect on the performance of these two subsectors, which experienced sharply declining shares of manufacturing value added during the 1980s. A possible explanation would be that these six new, relatively large establishments were set up for assembly purposes only.

During the 1970s and the early 1980s, a large number of small establishments that had not been covered by official statistics registered at the Ministry of Industries, Science and Technology (MIST). Many of these establishments have since lost the incentive to provide information concerning their activities to MIST, as they do not require import licences, and it has consequently become very difficult to obtain a complete overview of the sector. A current shortlist of the firms manufacturing metal products and machinery that has been drawn up recently by MIST suggests that there may have been several new firms entering the field during the 1980s.

Industrial employment in the formal sector in Ghana has generally witnessed a decline during the last decade, and there are also clear signs of recession in the capital goods industries. A look at the official statistics (table 2) will show that employment in the formal sector decreased gradually after having reached almost 10,000 in 1977. After the official figures for employment in the sector fell to less than half in 1984, they revived slightly in 1985-1986.

Table 2. Employment in capital goods industries

| Year | All industries | Manufacturing industry | Capital goods industry | Capital goods as percentage of all industries | Capital goods as percentage of manufacturing |
|------|----------------|------------------------|------------------------|---|--|
| 1975 | 104 554 | 77 008 | 6 960 | 6.6 | 9.0 |
| 1976 | 116 807 | 89 095 | 8 843 | 7.1 | 9.6 |
| 1977 | 126 196 | 88 967 | 9 781 | 7.8 | 11.0 |
| 1978 | 123 617 | 86 249 | 8 695 | 7.0 | 10.2 |
| 1979 | 119 714 | 79 832 | 8 577 | 7.2 | 10.7 |
| 1980 | 121 278 | 80 269 | 7 526 | 6.2 | 9.4 |

continued

Table 2 (continued)

| Year | All industries | Manufacturing industry | Capital goods industry | Capital goods as percentage of all industries | Capital goods as percentage of manufacturing |
|---------|----------------|------------------------|------------------------|---|--|
| 1981 | 117 823 | 77 365 | 7 293 | 6.2 | 9.4 |
| 1982 | 106 717 | 67 661 | 6 156 | 5.8 | 9.1 |
| 1983 | 97 501 | 58 278 | 5 043 | 5.2 | 8.7 |
| 1984 | 95 175 | 55 783 | 4 776 | 5.0 | 8.6 |
| 1985 a/ | 101 612 | 61 638 | 5 888 | 5.8 | 9.6 |
| 1986 a/ | 100 904 | 61 604 | 5 590 | 5.5 | 9.1 |

Source: Statistical Service, Accra.

a/ Figures provisional.

Other resources [14, 15] indicate that the number of employed persons in the informal enterprises at Suame Magazine had grown to at least 40,000 by 1986, of which those engaged in metalworking and vehicle repair constituted a major share. It is likely that several thousand people found employment in metalworking establishments in the informal sector.

The manufacturing value added (MVA) of the capital goods industries as a share of total MVA also declined consistently during the 1980s. It can be seen in table 3 that the sectors hardest hit by the crisis were electrical machinery and transport equipment. The firm that is covered by official statistics in the subsector of non-electrical machinery has characteristically never been more than marginal in terms of providing value added to the domestic economy. The figures for MVA indicate the dominance of imports and assembly in the formal sector, which generally provide less scope for domestic value added. Moreover, the performance of these assembly plants actually declined during the period under review, so that the ratio of, for example, electrical machinery to value added in 1984 fell to a third of what it was in 1975.

The use of raw materials of local origin has also been showing great subsectoral variations since the 1970s. These rates are shown in table 4. Only manufacturers of metal products have been able to steadily increase the use of local materials (scrap iron). Scientific and professional equipment producers have always been heavily dependent on imported materials. Producers of machinery and transport equipment (ISIC 382-384), who were forced to rely more on local materials during the period up to 1984, have now raised considerably the import content of the products.

Table 3. Share of manufacturing value added (MVA) by capital goods industries in MVA of all manufacturing (Percentage)

| Year | Categories (ISIC) | | | | | |
|---------|--------------------------|----------------------|--------------------------------|----------------------------|---------------------------|---|
| | Total capital goods (38) | Metal products (381) | Non-electrical machinery (382) | Electrical machinery (383) | Transport equipment (384) | Scientific and professional equipment (385) |
| 1975 | 6.91 | 3.28 | 0.05 | 1.57 | 1.96 | 0.05 |
| 1976 | 7.98 | 3.55 | 0.04 | 1.13 | 2.73 | 0.53 |
| 1977 | 5.87 | 2.70 | 0.03 | 1.20 | 1.43 | 0.51 |
| 1978 | 7.65 | 2.85 | 0.02 | 1.38 | 3.00 | 0.39 |
| 1979 | 6.92 | 2.70 | 0.05 | 1.09 | 2.78 | 0.30 |
| 1980 | 4.41 | 2.29 | 0.08 | 0.57 | 1.06 | 0.40 |
| 1981 | 4.29 | 2.32 | 0.02 | 0.58 | 1.01 | 0.36 |
| 1982 | 5.18 | 2.56 | 0.11 | 0.66 | 1.54 | 0.31 |
| 1983 | 3.80 | 1.84 | 0.05 | 0.39 | 1.35 | 0.17 |
| 1984 | 3.65 | 2.25 | 0.04 | 0.56 | 0.47 | 0.34 |
| 1985 a/ | 3.48 | 1.81 | 0.01 | 0.81 | 0.60 | 0.27 |
| 1986 a/ | 3.00 | 2.14 | 0.01 | 0.57 | 0.22 | 0.51 |

Source: Statistical Service, Accra.

a/ Figures provisional.

Table 4. Share of materials of local origin in total materials consumed by capital goods industries (Percentage)

| Year | Categories (ISIC) | | | | | |
|------|--------------------------|----------------------|--------------------------------|----------------------------|---------------------------|---|
| | Total capital goods (38) | Metal products (381) | Non-electrical machinery (382) | Electrical machinery (383) | Transport equipment (384) | Scientific and professional equipment (385) |
| 1975 | 9.1 | 10.7 | 6.6 | 9.2 | 18.1 | 5.8 |
| 1976 | 10.5 | 14.5 | 38.3 | 9.7 | 11.0 | 10.8 |
| 1977 | 21.2 | 20.0 | 2.3 | 12.7 | 26.2 | 18.2 |
| 1978 | 20.0 | 16.2 | 5.2 | 11.3 | 19.3 | 2.6 |
| 1979 | 18.9 | 17.4 | 3.7 | 16.7 | 20.6 | 2.6 |
| 1980 | 10.5 | 15.0 | 24.1 | 11.8 | 16.9 | 0.1 |
| 1981 | 8.8 | 11.5 | 28.5 | 19.3 | 14.1 | 0.1 |
| 1982 | 23.6 | 22.0 | 42.5 | 25.3 | 24.3 | 2.0 |
| 1983 | 14.0 | 12.5 | 40.8 | 26.3 | 27.2 | 0.5 |
| 1984 | 24.3 | 22.9 | 34.9 | 11.1 | 20.9 | 4.8 |
| 1985 | .. | 40.8 | 29.4 | 4.5 | 9.0 | 9.2 |
| 1986 | .. | 30.8 | 12.9 | 3.7 | 12.6 | 4.2 |

Source: Statistical Service, Accra.

The figures provide evidence of the shift in policy towards supply of raw materials for the formal sector of the capital goods industries. The problem during the economic crisis in the 1970s and early 1980s was lack of access to imported raw materials and components of adequate quality levels. The attempt to develop indigenous supply was, generally speaking, a failure and the economic recovery programme has tried to liberalize these imports.

The ratio of capital goods imports to total imports in Ghana is similar to that of most other developing countries. The percentage share of capital imports in Ghana's foreign trade fluctuated between a low of 22.1 per cent in 1979 and a high of 38.3 per cent in 1984 (table 5). The average ratio for the five-year period 1981-1985 is 31.8 per cent. Countries such as Côte d'Ivoire, Kenya and Zimbabwe had more or less the same ratio of imports in 1984, while Nigeria and the United Republic of Tanzania recorded ratios above 40 per cent [16].

Table 5. Share of capital goods imports in total imports in Ghana, 1975-1985
(Current prices, in millions of cedis)

| Year | Total imports | Capital goods imports | Percentage |
|------|---------------|-----------------------|------------|
| 1975 | 909.3 | 253.8 | 27.9 |
| 1976 | 991.7 | 285.0 | 28.7 |
| 1977 | 1 193.3 | 369.6 | 31.0 |
| 1978 | 1 681.8 | 593.2 | 35.3 |
| 1979 | 2 346.0 | 518.0 | 22.1 |
| 1980 | 3 103.6 | 999.7 | 32.2 |
| 1981 | 3 484.3 | 1 018.3 | 29.2 |
| 1982 | 2 781.6 | 877.4 | 31.5 |
| 1983 | 11 021.8 | 3 855.4 | 35.0 |
| 1984 | 21 663.0 | 8 305.1 | 38.3 |
| 1985 | 39 527.0 | 9 881.8 | 25.3 |

Source: Statistical Service, Accra.

The question is, however, to what extent inferences can be made from such figures. Developing economies that are in the process of rapid growth also require vast inputs of capital goods, usually more than local industries can supply. In the short term, large imports of capital equipment may be a healthy manifestation of very high rates of economic growth and rapid replacement or innovation of the fixed capital equipment.

What may be significant, however, is that some countries, among these Ghana, have experienced high ratios of capital goods imports simultaneously with economic recession. This would generally be an unhealthy symptom of industrial stagnation, indicating that the

indigenous capital goods sector is increasingly unable to supply a more or less constant market (a market merely demanding replacement of depreciated equipment) with the required inputs.

In order to understand whether Ghana's external trade in capital goods is behaving according to the interpretation suggested above, the domestic procurement ratio has to be analysed (that is, capital goods imports in relation to apparent consumption).

For virtually all categories of capital goods, the ratio of imports to apparent consumption has grown (table 6). This took place in years of stagnating industrial growth, as well as during years of expansion. During the 1980s, however, imports of capital goods rose faster than domestic production, thus lowering the domestic procurement ratio from around 25-30 per cent in the 1970s to figures in the region of 20 per cent in the early 1980s and which are now closer to 10 per cent. In other words, import dependence grew consistently during the 1980s.

Table 6. Apparent consumption and domestic procurement ratio for capital goods in Ghana, 1980-1988 (Current prices, in thousands of cedis)

| Year | Domestic production (a) | Imports (b) | Exports (c) | Apparent consumption (a+b)-c | Domestic procurement ratio $\frac{b}{(a+b)-c}$ |
|------|-------------------------|-------------|-------------|------------------------------|--|
| 1975 | 61 016 | 253 800 | 1 824 | 312 992 | 19.5 |
| 1976 | 135 953 | 285 000 | 2 105 | 418 847 | 32.5 |
| 1977 | 154 307 | 369 600 | 4 140 | 519 767 | 29.7 |
| 1978 | 212 751 | 593 200 | 3 205 | 8 002 746 | 26.5 |
| 1979 | 284 187 | 518 000 | 12 445 | 789 542 | 36.0 |
| 1980 | 240 886 | 999 700 | 2 428 | 1 238 158 | 19.5 |
| 1981 | 293 372 | 1 018 300 | 50 075 | 1 261 597 | 23.3 |
| 1982 | 241 126 | 877 400 | 4 742 | 1 123 268 | 21.5 |
| 1983 | 309 584 | 3 855 400 | 4 505 | 4 160 479 | 7.4 |
| 1984 | 807 277 | 5 321 700 | 16 698 | 6 112 279 | 13.2 |

Source: Computed from data obtained from the Statistical Service, Accra.

Since 1983, exports of Ghanaian capital goods have constituted a totally insignificant share of manufacture exports, which are themselves marginal. Table 7 indicates that Ghana achieved significant exports only during one year, namely 1981. In that year, exports of capital goods amounted to something in the region of 2 per cent of total exports. This figure is probably an indicator of re-exported goods. Table 8 shows that re-exports (goods of foreign origin) constituted a major share of capital goods exports

in 1981 and 1985, while the years 1979, 1983 and 1984 were years in which goods of domestic origin were of greater importance.

Table 7. Share of capital goods a/ in total exports
(Millions of cedis)

| Year | Total exports | Capital goods exports | Percentage |
|---------|---------------|-----------------------|------------|
| 1975 | 928 265.0 | 1 823.9 | 0.20 |
| 1976 | 950 908.5 | 2 105.4 | 0.22 |
| 1977 | 1 166 138.3 | 4 140.0 | 0.35 |
| 1978 | 1 580 556.9 | 3 204.6 | 0.20 |
| 1979 | 2 737 133.8 | 12 444.6 | 0.45 |
| 1980 | 3 157 764.8 | 2 428.4 | 0.08 |
| 1981 | 2 685 633.0 | 50 074.8 | 1.86 |
| 1982 | 2 211 723.3 | 4 742.0 | 0.21 |
| 1983 | 10 225 082.5 | 4 504.9 | 0.04 |
| 1984 | 19 396 042.2 | 16 197.6 | 0.09 |
| 1985 b/ | 33 489 805.4 | 38 008.6 | 0.11 |

Source: Statistical Service, Accra.

a/ SITC (Rev.1) categories 69 and 7.

b/ Figures provisional.

Table 8. Share of capital goods of domestic origin in capital goods exports
(Percentage)

| Year | Total (69+7) | Sub-categories (SITC) | | | |
|------|--------------|-----------------------|-------------------------------|---------------------------|--------------------------|
| | | Metal products (69) | Non-electrical machinery (71) | Electrical machinery (72) | Transport equipment (73) |
| 1975 | 76.4 | 66.1 | 8.9 | 99.8 | 65.7 |
| 1976 | 55.0 | 10.8 | 23.4 | 94.3 | 61.8 |
| 1977 | 28.7 | 38.7 | 7.1 | 80.4 | 9.7 |
| 1978 | 32.6 | 87.6 | 11.1 | 80.3 | 9.1 |
| 1979 | 87.1 | 51.3 | 15.9 | 97.0 | 36.7 |
| 1980 | 38.3 | 94.9 | 1.7 | 97.7 | 8.9 |
| 1981 | 4.1 | 20.0 | 0.1 | 0.0 | 17.5 |
| 1982 | 2.8 | 0.8 | 8.4 | 9.1 | 1.6 |
| 1983 | 99.0 | 99.9 | 97.6 | 94.9 | 59.7 |
| 1984 | 70.3 | 78.9 | 5.8 | 5.2 | 6.0 |
| 1985 | 6.0 | 69.0 | 0.1 | -- | -- |

Source: Statistical Service, Accra.

An analysis of official statistics supplied by the Statistical Service regarding exports accordingly conveys the impression that Ghanaian producers appear to have progressively lost comparative advantage on foreign markets in most categories of capital goods over the 1980s. In non-electrical machinery (which includes agricultural machinery) and transport equipment, there had never been any sign of comparative advantages. Exports of domestically produced electrical machinery were rapidly collapsing during the 1980s.

The domestic contribution to exports of metal manufacturing is, judging from evidence presented in various reports, primarily made by the exports of machetes. In a report prepared for the Ghana Export Promotion Council ([17], p. 2), it is argued that the only product that can be said to have established a standard for quantity, quality and for superior design is the machete.

The official statistics for exports may not, however, reflect the total amount of machinery etc. sold to other countries, since smuggling took place on a large scale during the 1970s. A survey of small-scale manufacturing at Kumasi [14] also indicates that many entrepreneurs had had customers from neighbouring countries, but the actual extent of such exports was not assessed.

D. The informal sector: dynamic small-scale production

The informal sector has provided most of the industrial dynamism in Ghana during the last decade through the operation of small-scale units. The sector is inherently difficult to analyse, since there is a lack of accurate data on the vast number of informal, small-scale engineering shops in Accra and in "industrial slums" such as the Suame Magazine at Kumasi.

There is no doubt that some components and simple items can be economically produced by the small-scale sector. There is, of course, still the declining, but apparently substantial number of village blacksmiths, which have been partially surveyed in an International Labour Organisation (ILO) report from the early 1980s [18]. These continue to supply and repair basic agricultural implements in the rural areas, and efforts have also been made to expand and improve their product range through the supply of training in appropriate (or intermediate) technology. This is, in fact, one of the main objectives of the Development and Application of Intermediate Technology secretariat at MIST, a scheme for the diffusion of appropriate technology operating under the auspices of MIST, which has recently entered its second phase after a decade of building up capabilities in R and D institutions.

The main characteristics of this group of small-scale producers is, however, that they are mostly operated as a part-time activity. The ILO report argues:

"In the rural areas ... blacksmiths work on a parttime basis and serve the people in the rural areas largely for social rather than economic reasons (e.g. personal relationships, kinship etc.). Unlike the urban

entrepreneurs who depend entirely on their industrial activity for their income, about 78 per cent of the surveyed rural blacksmiths were farmers who derive as much as 75 per cent of their income from farming. Thus, they do not depend on the blacksmithery as the main source of their income." ([18], p. 21)

As a result of this, rural producers of simple capital goods are probably more resilient with respect to price changes and structural depression in their limited markets. On the other hand, they seem to be rather cautious about entering into more extensive, full-time production and therefore cannot be expected to engage in dynamic growth in the same way as urban small-scale entrepreneurs. Nevertheless, the rural producers continue to form the backbone of the supply of agricultural implements to most farmers.

The urban small-scale enterprises engaged in the manufacture of maintenance of capital goods appear, however, to be primarily engaged in the transport equipment subsector. More specifically, they have been providing spare parts and repair and maintenance services to vehicles in circumstances where the supply of such services from the formal sector was inadequate. But in the case of the Suame Magazine small-scale enterprises at Kumasi, for instance, a large number of enterprises (or entrepreneurs, as these units, usually led by a single proprietor, might perhaps more appropriately be called) have actually graduated into engineering, providing a relatively limited, but considerable, market with machinery of various specialized types.

A case study of the small-scale sector at Kumasi [14] studied in particular the entrepreneurs engaged in the metalworking and engineering field. Several of these entrepreneurs had made efforts to raise their overall level of technological capability. In particular, they had acquired relatively more advanced, but still appropriate, machine tools for their units and were in a much better position to cope with the kind of constraints and competition imposed by the Economic Recovery Programme.

E. Indigenous technological capability: a weak foundation

There is evidence of a modest level of achievement in the metalworking industry, with manufacturing activities in the subsector geared towards the production of primary agricultural and food-processing equipment. The manufacture of hand tools takes place at several levels of technology, including modern forging plants like the Bibiani Metal Complex and the Crocodile Matchet Factory at Tema, both of which produce high-quality hand tools. Capabilities also exist for the manufacture of low-technology machine tools such as wood lathes, pedestal electric grinders, cross-cut saws and wood-planing machines. A base for the repair and maintenance of plant and machinery, including more complex equipment, has also been established. However, capital goods production in the sense of machinery and equipment of high technological complexity is still virtually non-existent, and the local manufacturing capabilities have not generally reached the high technological level normally required for such products.

The technological capability of the small-scale units is directed towards imitation and is generally sufficient for making small numbers of almost any low-technology mechanical part. Production is usually undertaken in response to specific requirements of customers, and is carried out mostly against firm orders. There is seldom any standardization in the use of materials and tools; product specification is rough and does not presume interchangeability of parts.

Skills have been acquired mostly through apprenticeship to master craftsmen and through repair and maintenance of imported equipment. Practically all of the personnel sampled by Dawson [14] received their training through apprenticeship in small firms (table 9). The engineering subsector has the highest percentage of technical institute graduates. This may be explained by the fact that precision machine-tool handling requires some level of basic literacy and formal training. The metalworking subsector follows with 5.7 per cent of the sampled group having attended vocational and technical institutes.

Table 9. Sources of training of sampled proprietors at Kumasi

| Subsector | Apprenticeship in small firm | Apprenticeship in large firm | Training institutes | None | Other |
|-------------------------|---------------------------------|---------------------------------|------------------------|------|-------|
| Vehicle repair | 318 | 22 | 5 | 0 | 2 |
| Metalworking | 100 | 15 | 7 | 1 | 2 |
| Engineering services | 16 | 10 | 5 | 0 | 9 |
| Others | 24 | 0 | 2 | 0 | 2 |
| Total | 458 | 47 | 19 | 1 | 6 |
| Percentage | 86.25 | 8.85 | 3.58 | 0.19 | 1.13 |

Source: [14].

In the formal sector, the workforce is comparatively better trained. Many workers and middle-level supervisors are graduates from technical institutes or polytechnical schools who have been trained in the various practically oriented engineering crafts and some intermediate professional disciplines. Lately, some of these institutions for technical and vocational training have been upgraded and programmes have been initiated with the aim of improving the skills of the Ghanaian workforce. Most supervisory and managerial positions in the formal sector are, however, occupied by university graduates with degrees and diplomas in special disciplines of science and technology.

In recognition of the crucial role of R and D in the process of developing indigenous technological capability in the economy, Ghana has taken several steps to enhance the national scientific

and technological system. While success has apparently been achieved in some scientific disciplines, specific R and D efforts related to the capital goods sector have been relatively weak. In figure III, a list is provided of research institutions and their R and D activities related to the sector. It can be seen that a majority of projects relate to the agro-industries or, more specifically, to the development of equipment for food processing.

Figure III. Research institutions and their R and D activities in relation to the capital goods sector in Ghana

| <u>Institution</u> | <u>R and D activities</u> |
|--|---|
| Technology and Consultancy Centre (Kumasi) | Testing of rice threshers, development of plough implements, improvement of brick and tile equipment |
| Centre for Development Studies, University of Cape Coast (Cape Coast) | Development of technological capacity in agro-industries |
| Industrial Research Institute, Council for Scientific and Industrial Research (CSIR) (Accra) | Development of chicken incubators, design and manufacture of agricultural implements for small-scale and rural industries, including potter's wheels, maize planters, shellers, solar driers and rice planters. Development of water pumps for irrigation |
| Food Research Institute, CSIR (Accra) | Development of maize shellers and other post-harvest equipment |
| Building and Road Research Institute, CSIR (Accra) | Design and development of small- and medium-scale brick factories |
| Department of Agricultural Engineering, University of Science and Technology (Kumasi) | Development of food-processing equipment, including winnowers, cassava graters and presses, hand corn-shellers, feed mills, palm-oil digesters, crop driers and wood gassifying plants |
| Department of Mechanical Engineering, University of Science and Technology (Kumasi) | Solar crop driers, hand pumps |

The developments so far in the capital goods sector have mostly been initiated by the international diffusion of technical know-how. Imported product designs have been modified over the years, primarily through force of circumstances and according to the availability of raw materials. There is some evidence of isolated cases

of indigenous development activities within a few local manufacturing firms. Seven firms in a sample of 27 firms responding to a questionnaire in 1989 indicated that they had some capacity for basic design and product R and D. Another survey by the Technology Transfer Centre during a study of 140 firms participating in the 1988 industrial fair, "INDUTECH 88", showed that among the 36 exhibitors engaged in capital goods production, 10 had facilities for some level of in-house R and D, while two relied on R and D done by local institutions and 20 tended to rely on R and D done outside the country.

A striking feature of these R and D activities is, however, that most aim at the adaptation of imported designs to local materials, with a view to reducing reliance on imports. Given the level of education and training of personnel in most establishments in the sector, there is a limit to the type of equipment that can be developed, and design is thus not likely to go beyond adaptations and modifications using intermediate-level technologies.

More advanced R and D activities are found in public-funded research institutes and the universities. Within the Council for Scientific and Industrial Research (CSIR), for example, four divisions are engaged in R and D activities concerned with the design and manufacture of agricultural implements, electric circuit design and the design of various energy appliances. In addition, the Departments of Agricultural Engineering and Mechanical Engineering at the University of Science and Technology at Kumasi are also engaged in the development of new technologies for the capital goods sector. Among the products that have successfully been designed and developed by these institutions are cassava graters, palm-nut crackers, presses, kneading machines and a number of hand tools.

A major constraint facing R and D activities in the country is the low level of resources for formal R and D. This makes it difficult for researchers to engage in serious and sustained activities which would lead to the generation of new products of high technological complexity.

There is also the lack of experienced R and D personnel in the capital goods sector. This appears to arise from the employment pattern of local engineers and scientists. With few research and design units in the formal sector and almost none in the informal sector, local engineering personnel invariably find themselves in the role of supervising maintenance works, usually without exposure to design and development during their career period.

Another problem is that of diffusion of the results of research and development. The Technology Transfer Centre of CSIR at Accra and the Technology Consultancy Centre at the University of Science and Technology at Kumasi are both involved in the process of transfer of results to industry, but this has proven an extremely difficult task. Apart from these institutions and Government-sponsored programmes such as the Development and Application of Intermediate Technology, there is virtually no link between commercial producers and the research institutes or the universities.

One of the problems of usefully exploiting the know-how that exists within the borders of Ghana is the competition created by unco-ordinated research activities. The lack of co-ordination is especially evident within the formal research institutes and among university departments, with considerable duplication of effort between these research units. A look at the research activities listed in figure 11 shows that several research units have been at work on the same topic. The solar crop drier is another piece of equipment that has been the object of many R and D projects but which has still failed to achieve substantial commercial diffusion.

In terms of basic technological capabilities, a recent trend has been the gradual rehabilitation of firms engaged in the manufacture of metal products. These firms are now in the process of consolidating their technological capabilities for future expansion. The technologies utilized in this subsector (foundry, castings and heat treatment) are also vital in the manufacture of agricultural and food-processing equipment.

More advanced technologies of welding are also increasingly being mastered by a number of enterprises, notably the producers of various kinds of tanks and containers. Some units use their capabilities in welding to enter into the production of food-processing machinery or transport equipment (e.g. carts). However, it is likely that many of these units, particularly those of a relatively small scale, would benefit from a substantial upgrading of technical facilities for arc welding.

The machining of parts remains one of the most crucial, but also, regrettably, one of the weakest areas of technological capabilities in Ghanaian capital goods industries. The irony of the situation is that the most dynamic group of enterprises, the small-scale jobbing workshops, repair shops etc., are lacking essential equipment for their work, while larger enterprises, such as the Railway Workshop at Takoradi, have acquired a wide range of equipment and skilled manpower but underuse these facilities to an appalling degree.

F. Options for strengthening capital goods production

The lack of an indigenous capability to produce tools, machinery, transport equipment and other essential means of production for important sectors in Ghana will result in continued dependence on foreign aid. It is therefore obvious that a clear policy is needed to strengthen the sector and nurture its future growth. Such a policy decision will have to be accompanied by concrete, additional resources in order to effectively improve the situation for dynamic enterprises. In both centrally planned economies, such as Cuba, and market economies, such as Brazil and the Republic of Korea, the State has successfully intervened to protect and develop capital goods production.

The need for an active role of the Ghanaian Government is equally apparent. The period of new economic growth initiated by the Economic Recovery Programme could be used to create a larger

domestic demand for capital goods that might "pull" the sector ahead in technological innovation and production capabilities. Consequently, the Government should primarily apply "push" strategies in the form of developmental support in order to set the whole system in motion.

It is characteristic of the present situation in Ghana that bottle-necks and shortcomings continue to hold back development in the capital goods sector, particularly since no comprehensive policy related specifically to this sector can be discerned. Moreover, the difficulties experienced in gathering accurate, up-to-date information on the manufacturing units involved in the sector show that there is an urgent need for improved monitoring.

Even with the current capacity for production of capital goods, it has been very difficult for manufacturers to develop and capture markets in Ghana. The absence of long-term financial resources is probably the most significant drawback in this regard. The interesting aspect of the current situation is that while external loan facilities have improved access to foreign exchange, it is still extremely costly and difficult for manufacturing firms to raise the necessary capital in local currency. Interest rates have soared in recent years, and these conditions benefit commercial capital rather than the capital invested in manufacturing facilities.

The Government could provide significant assistance to the sector by the assignment of special credit (in cedi value) on soft lending terms, and ensure that these credit lines are managed according to set objectives. One of the problems of raising capital, especially for small firms and private entrepreneurs, has been that the commercial banks generally refuse to accept fixed assets as collateral for loans.

The institutional framework for provision of such financial resources could also be improved. Since the commercial banks have so far been reluctant to support manufacturing, a number of existing institutions set up more explicitly to cater for long-term investments might be rehabilitated. One of these is the Ghanaian Enterprise Development Commission, which could be reinforced financially to strengthen capital goods industries. Another institution is the National Investment Bank, which has previously had a rather limited record of financial assistance to manufacturing firms; for instance, providing loans equivalent to 3.5 per cent of their total lending in 1982.

The provision of high-quality raw materials requires that priority in obtaining financial support (credit lines in foreign and local currency) should be given to industries producing various raw materials and intermediate products for the capital goods sector, such as foundries using scrap metal. At present, the facilities for melting and casting metal (foundries, steelworks) are rapidly increasing in Ghana. It is important that the quality of output from these facilities be assured. Similarly, foreign technical assistance should be sought for the upgrading of production technology and testing facilities in order to ensure the quality of local materials.

The workforce could be recruited from the polytechnical schools and from among the engineering graduates from the University of Science and Technology. Generally speaking, however, there is a need for more widely disseminated and more advanced training opportunities. There is also a lack of advanced training in the area of design, an area that is becoming increasingly important in the development of capital goods manufacture globally.

The importance of raising the overall level of endogenous technological capabilities in the sector was stressed earlier in this paper. The introduction of improved designs, both through the effective use of domestic R and D capacity and through imports of foreign know-how, will constitute an important step forward. On the basis of both potential market demand and the apparent interests of existing institutions and schemes, high priority could be given to the improvement of design and performance of endogenously developed technologies in food processing, simple construction equipment and implements for agriculture and rural transport.

A strengthening of R and D in research institutions should involve co-ordination and more explicit efforts to commercialize results. Such strengthening may take the form of a major project mobilizing the co-operation between research institutes and local producers to do research on the above-mentioned priority areas. Several research institutions working in the area of food-processing equipment have been identified, where there is also a substantial number of both large and small producers. As a first priority, a project should be developed for bringing these research institutes and producers together in a concerted effort to improve local design of this equipment.

The institutional framework for such a concerted effort is more or less in place. Given its mandate to co-ordinate research in Ghana, CSIR would be the natural agency for supervising a new approach, while the Technology Transfer Centre would probably be the best unit to take administrative responsibility. It would be advisable to co-opt several existing networks, for example, the Development and Application of Intermediate Technology secretariat at MIST and the Ghana Regional Appropriate Technology Industrial Service project.

Under the present policy of import liberalization, domestic producers are facing increased competition from imports. While this policy may be necessary as an overall framework for encouraging more competitive industries in Ghana, there is no doubt that the widespread availability of foreign goods tends to restrict the possibility for growth (occasionally even survival) of domestic infant industries. In the case of simple food-processing equipment, for instance, such effects are undesirable on account of benefits such as economic externalities, employment and know-how accumulation that accrue from the growth of a domestic infant industry.

An important instrument for supporting sustainable domestic markets in capital goods is to formulate targeted public procurement arrangements for priority areas. The strategy would entail giving

instructions to all relevant Government organizations to try to secure local production before looking for foreign suppliers. In the course of the present study, several such areas of manufacture have been identified, notably:

(a) Food-processing equipment (corn mills, cassava graters, palm-oil digesters and presses, shea-nut kneaders etc.);

(b) Agricultural implements and machinery (machetes, harrows etc.);

(c) Equipment for the timber and wood industries (trailers, cross-cut saws, wood lathes etc.);

(d) Machinery used in the construction industry (brick presses, sand/landcrete moulding machines and other simple machinery).

It would also be useful to establish a monitoring and evaluation scheme, whereby public authorities could identify and assess the viability of local procurement (for instance, an information system describing suppliers of local products and their technological level). For these priority areas there should be a preference for projects where foreign donors provide raw materials, equipment etc. to Ghanaian capital goods producers, instead of supplying the final goods from their own industries. Such a strategy has been successfully pursued with regard to production of bicycle trailers.

A useful process of decision-making presupposes a continuous monitoring mechanism. In view of the weakness of institutions such as MIST and the Statistical Service in terms of collecting and processing up-to-date information, it would probably be necessary to conduct special surveys and set up a specialized data base. The following information would be required: (a) an assessment of the actual and potential market for various capital goods; (b) the number of producers and their actual output; (c) the current technical performance of domestic products, based on field tests; (d) the need for further technological development; and (e) sources of supply for new technologies.

G. Conclusions

In the early days of Ghanaian independence, priorities were placed on the development of the capital goods sector as an essential component of import-substitution policies. Since the 1970s, however, such priorities in the economic and industrial policies have been more in words than in deeds. A review of the sector presents a picture of decline or stagnation for more than a decade, with the formal sector of the capital goods industry suffering a recession exceeding even that of manufacturing in general.

Nevertheless, the study also shows that skills and indigenous technologies have been developed in selected fields (e.g. agricultural implements and maintenance of transport equipment). Moreover,

there now exists a sizeable pool of manpower skilled in the basic metalworking technologies used in the sector, and sources of additional manpower are potentially available. Although design capabilities in the industry are weak, there are a considerable number of cases where new, improved designs are available from local R and D institutions.

The supply of raw materials, which used to be seen as the most serious problem in the sector, appears to have been improved, partly on the basis of recycled scrap iron and partly through relatively easier access to imported high-quality steel. Owing to the various avenues of import liberalization that have been opened in recent years, there also seems to be easier access to core components (e.g. primary drivers, bearings) for capital goods production in Ghana. On the other hand, constraints persist in actual access owing to the lack of investment resources for the vast majority of firms.

In general, the ratio of foreign to domestic inputs in the capital industry tended to increase during the 1980s, causing an increased drain on foreign exchange. The ratio of imported capital goods to apparent consumption has also grown in recent years, with the result that markets for domestic producers, which are already rather small, are further reduced.

The largest difficulty appears to derive from the adverse environment in which enterprises of all sizes have to operate. During the economic recession, more and more firms became engaged in commerce (e.g. direct imports of goods or assembly of knocked-down equipment) rather than in manufacture, and the financial system unfortunately exhibits a bias against expanded investment in the capital goods sector. Sustained, long-term development of the capital goods sector is limited by the high cost of, or lack of direct access to, credit. Even commitments by foreign donors based on a long-term perspective appear to become operational in Ghana in the form of short-term credit only.

One of the reasons for this is the policy of many banks, which appear to insist on real estate as security for loans. According to some sources, the banks do not accept fixed assets of entrepreneurs as the main security for a loan. The problem is aggravated by the (generally unsupported) fear that the loan-recovery rate, which is already fairly low, would further deteriorate if credits were to be provided on the basis of fixed assets. The fear of losing money, moreover, seems to lead to some odd practices by the banks, such as the hoarding of essential inputs (raw materials, components and equipment).

The study fails to reveal any concerted priorities with regard to the promotion of foreign investment in the capital goods sector on the part of the Government or its executing agencies. The absence of overall policy priorities in this area is exacerbated by the lack of adequate instruments, or political will, to implement the vague priorities that exist on paper. The priorities set up for indigenous research and development efforts have tended to become rather unproductive. There have been instances of apparent duplication in research projects (e.g. manual corn shellers and solar

crop driers) and the choice of research topics appears to lack consistency, response to apparent market demand and institutional means for coherent commercialization.

In order to revitalize the capital goods industries in Ghana and enhance the development of indigenous technological capabilities, there should be a new effort made to introduce both developmental support and regulation relevant to the sector. Improved mechanisms for continuous monitoring of the local industry should be established and appropriate decision-making priorities identified, specifically earmarked for long-term, developmental investment needs. Steps should be taken to encourage linkages between enterprises and a policy mechanism should be established for extending selective protection (e.g. import restrictions) to the firms producing capital goods in priority areas such as food-processing equipment.

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AN APPLICATION OF THE DOMESTIC RESOURCE COST
INDICATOR TO MEXICAN MANUFACTURING

John Weiss*

Introduction

The domestic resource cost ratio (DRC) is a well-known indicator for assessing the economic efficiency of different productive activities and for planning the participation of an economy in international trade.** This article reports the results of DRC estimates for manufacturing in Mexico in 1980. It also draws attention to the inherent limitations of such exercises. Prior to the empirical discussion, different definitions and uses of the DRC indicator are considered.

A. DRC definitions

The original concept of DRC was intuitively fairly obvious [5]. The domestic resources involved in a net saving or earning of foreign exchange are compared with the net foreign-exchange effect to give an exchange rate for a particular economic branch, enterprise or new investment. This can be expressed algebraically as follows:

$$DRC_i = \frac{a_{ij} \cdot L + a_{ki} \cdot K + a_{ni} \cdot N}{(P_i - a_{ti} P_t)} \quad (1)$$

where a_{ij} , a_{ki} and a_{ni} are the units of labour, capital and non-traded goods respectively required per unit of i ;

L , K and N are the unit prices of labour, capital and non-traded goods respectively;

P_i and P_t are the world prices of output i and traded input t respectively; and a_{ti} is the unit of input t per unit of i . Calculation can be either for a single year or, if used for ex-ante planning estimates, can be discounted to the present with both sides of the ratio given as present values. Where the denominator of equation (1) is in foreign exchange (e.g. United States dollars (\$))

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**For theoretical surveys of the DRC concept, see [1] and [2]. For a discussion of its use in planning, see [3], and for a detailed application in one country, see [4].

and the numerator in local currency (e.g. Mexican pesos (\$Mex)), DRC_i gives an exchange rate for i (in \$Mex per \$) that can be compared with the official exchange rate (OER); the test of efficiency being $DRC_i < OER$. Where market prices and economic values diverge significantly, as is still typically the case in developing countries, efficiency requires that DRC_i be below the appropriate shadow exchange rate (SER), with domestic resources valued at shadow, not market, prices.

The simple expression for DRC given in equation (1) assumes that no indirect foreign-exchange effects are involved in the use of what are defined as domestic resources. However, developments in the methodology of effective protection [6] and of shadow pricing [7], [8] have allowed further refinements of equation (1). The main modifications are to allow for the wide range of possible indirect foreign-exchange effects that can arise from the use of domestic resources, which can make it difficult to specify accurately the denominator of the ratio. For example, non-traded inputs will normally have a significant traded component, so that, in principle, all such inputs can be disaggregated into domestic factors and traded inputs, with the former added to the numerator of the ratio and the latter subtracted from the denominator. This allows equation (1) to be rewritten, removing non-traded inputs into i as a separate domestic resource, so that

$$DRC_i = \frac{a_{li}^l \cdot L + a_{ki}^l \cdot K}{(P_i - a_{ti}^l \cdot P_t)} \quad (2)$$

Now a_{li}^l and a_{ki}^l refer to total (direct plus indirect) labour and capital inputs per unit of i , with indirect inputs covering labour and capital used in the non-traded inputs that go into the production of i .

Similarly a_{ti}^l refers to total (direct plus indirect) traded inputs into i , with indirect traded inputs being those traded goods used in the non-traded inputs that go into the production of i .

In addition, domestic factors of production will have indirect foreign exchange effects. Local labour, for example, may have an opportunity cost in terms of foregone traded output, and capital assets will generally have major traded components, particularly in the form of traded plant and equipment. Theoretically, this can be handled by valuing all domestic factors at shadow prices based on equivalent world market values [7]. A new specification of the DRC now emerges where

$$DRC_i = \frac{a_{li}^l \cdot L \cdot CF_i + a_{ki}^l \cdot K \cdot CF_k}{(P_i - a_{ti}^l \cdot P_t)} \quad (3)$$

All terms are as in equation (2), except that CF_i and CF_k are conversion factors required to convert shadow prices of labour and capital respectively from a domestic to a world price system of valuation.* In this expression for DRC, no single SER is required and economic efficiency requires $DRC_i < 1.0$. Here, DRC has ceased to be a comparison between domestic resources and a net foreign-exchange effect. Rather, it is now a comparison between the net foreign exchange generated in operations and the foreign-exchange equivalent value of the resources required to maintain operations. Equation (3) is therefore an efficiency indicator, not an exchange rate.

While equation (3) can be shown to be the most rigorous specification of DRC [9], it is also the most demanding in terms of data requirements and therefore the most difficult to apply. The results reported here are based on a hybrid definition of the DRC that goes beyond equation (1), but not so far as the full specification in equation (3). Here, no attempt is made to decompose non-traded inputs; however, an effort is made to allow for the indirect foreign-exchange effects of the use of domestic resources through the application of approximate conversion factors. For the empirical estimates, the definition of DRC used is as follows:

$$DRC_i = \frac{a_{iL} \cdot L \cdot CF_L + a_{iK} \cdot K \cdot CF_K + a_{iN} \cdot N \cdot CF_N}{(P_i - a_{ti} P_t)} \quad (4)$$

All terms are as in equation (1), while CF_L , CF_K and CF_N are conversion factors to convert labour, capital and non-traded costs respectively into world price equivalent values. Again, as with equation (3), using equation (4) efficiency requires a DRC value of below 1.0.

B. Applications of DRC

Planning applications of DRC can be distinguished in various ways: for example, in terms of ex-ante and ex-post analyses. In the former, DRC is either equivalent to conventional cost benefit calculations, where the DRC ratio is in present value terms, or a short-cut single year indicator that is inferior to the net present value (NPV) or internal rate of return (IRR) calculations over the full life of an investment. Most DRC applications tend in fact to be ex-post, examining the efficiency of existing operations. Data for this ex-post assessment typically come from either firm level surveys, or national statistics such as input-output tables or censuses of production. Calculations can be done for individual enterprises or at the branch level, where aggregate data for enterprises in a branch are examined. The results of this type of

*A conversion factor can be defined as the ratio of the shadow to the market price of an item.

ex-post assessment may be used, along with ex-ante indicators, to guide priorities in the allocation of resources such as foreign exchange and domestic credit.*

Ex-post DRC calculations typically focus on the efficiency of operations in a single year. This necessitates a further distinction between shortand long-run costs and therefore shortand long-run DRCs. The short-run DRC includes only variable costs of production, so that capital inputs in equations (1) to (4) will cover only maintenance expenditure and not the full replacement costs of assets. In addition, given the sensitivity of costs to the rate of capacity utilization, it is common to find two separate short-run DRCs estimated, one for operations at the current rate of capacity utilization and the other at full-capacity working.

Long-run DRCs, on the other hand, should include the full cost of capital assets at their replacement costs in the prices of the base year for the calculations. This version of DRC can also be estimated at current and full working capacity. Shortand long-run DRCs can be seen as giving information relevant to two related, but distinct, issues. The short-run indicator will be relevant in assessing how resources to support existing production should be allocated; for example, foreign exchange for the input of raw materials and components, or domestic credit for working capital. The long-run indicator will be relevant whenever resources for capacity expansion are to be allocated and detailed project feasibility studies are not available.

The Mexican results reported here are ex-post estimates for the operations of Mexican manufacturing at the level of 49 manufacturing branches. The estimates are longer rather than short-run, and are at current rather than full working capacity. The data involved are taken from national statistics, and not from individual enterprise surveys. The results can be seen as broadly indicative of the pattern of economic efficiency in Mexican manufacturing in the late 1970s and early 1980s. However, as a guide to decisions on future resource allocation, these estimates suffer from limitations of both an empirical and a conceptual nature, common to this type of exercise; limitations which are commented on below.

6. DRC estimates for Mexican manufacturing in 1980

To the author's knowledge, the present study is the first to estimate DRCs for Mexican manufacturing, although estimates of the effective rate of protection (ERP) have been made in the following studies: [11], for 1969; [12], for 1970; and [13], for 1978-1984.

Methodically, ranking by DRCs is inappropriate as a means of setting priorities [19]. Strictly, the ratio gives a measure of whether an activity is efficient or inefficient. Ranking becomes more tenable, however, where there is uncertainty over key values, particularly SER.

The estimates here refer to 1980, the most recent year for which the necessary data on input coefficients and world and domestic relative prices were available. The form of DRC used here, in equation (4), is similar to the "simple" Corden expression for ERP [14], where all non-traded inputs into an activity are included as part of domestic value added. Therefore, this version of ERP is also derived and given alongside the DRC results.

The DRCs are based on the following three separate sources of data:

(a) Input coefficients for manufacturing are taken from the national input-output matrix for 1980 [15]. This table disaggregates the economy into 71 productive activities, including all 49 manufacturing branches;

(b) Comparisons between domestic and world prices for manufacturing output and traded inputs into manufacturing are based on data on tariff equivalents for 1980 given in the national industrial plan [13];

(c) Conversion factors to derive shadow prices, at world price equivalents, for domestic factors and non-traded inputs are based on approximate calculations by the author, plus recent estimates for Mexico [16].

In estimating equation (4) for each manufacturing branch, all manufacturing activities are taken to be traded. The denominator of equation (4) is therefore the difference between per unit output value at world prices and traded inputs per unit of output at world prices. These world prices were derived by subtracting from domestic prices the estimated tariff equivalents for different production branches.

The numerator of equation (4) is composed of labour, capital and non-traded input costs. Labour is subdivided into skilled and unskilled workers, so that in applying equation (4), $r = 2$. The total wage cost for each manufacturing branch is divided into these two categories using the proportion for skilled and unskilled labour costs for each branch in the study [16]. For capital, only one aggregate cost is used in the equation, so that $k = 1$. It is assumed that the profit category from the national input-output table of "operating surplus" can be used as a proxy for the replacement cost of capital. This is a strong assumption, however, and is commented on below. Non-traded inputs into manufacturing come from branches 60 to 72 of the national input-output table covering construction, public utilities and services. In applying equation (4), therefore, 13 separate non-traded inputs are identified, so that $n = 13$.

To calculate equation (4), conversion factors are required to express the different elements of the numerator in world market equivalent prices. For unskilled labour, costs at domestic prices are converted using a factor of 0.52. This conversion factor is estimated in a study on shadow prices for Mexico for the

mid-1980s [16]. Although the period covered by this study is later than the year to which the DRC estimates refer, a significant fluctuation would not be expected in the conversion factors for unskilled labour because of the long-term structural nature of the labour-market conditions that create divergences between market and shadow wages. Further, the relatively small share of unskilled-wage costs in branch output implies that approximations in this parameter will not create major inaccuracies in the final results.

Apart from unskilled labour, all other elements in the numerator of equation (4) are adjusted by a single aggregate or standard conversion factor (SCF). This can be interpreted as an average ratio of world to domestic prices for the economy, and can be seen as the inverse of the ratio of the shadow to the official exchange rate: $(SCF = \frac{1}{SER/OER})$. Estimation of SER itself for 1980 is also approximate. 1978 is generally seen as a year when the exchange rate was in equilibrium, and between 1978 and 1980, the real exchange rate appreciated by approximately 15 per cent in comparison with the 1978 level. This rate of appreciation is found from the real exchange rate index published by the Banco de México.* A ratio of SER/OER of 1.15 is therefore used to derive an SCF value of 0.87. This is used to convert the market-price values of skilled labour, capital costs and all non-traded inputs to shadow prices.

The DRC and ERP estimates for all manufacturing branches are given in table 1. In addition, branches can be grouped into different categories depending on their end-use. The structure of Mexican manufacturing by categories applied commonly in industrial studies is shown in table 2. A summary of the main results for these categories of manufacturing is given in table 3.

Table 1. Domestic resource cost (DRC) and effective rate of protection (ERP) estimates for manufacturing, 1980

| Branch | DRC | ERP a/ |
|-----------------------------|------|--------|
| 11. Meat and dairy products | 1.21 | 40.8 |
| 12. Fruit products | 0.84 | 2.9 |
| 13. Wheat processing | 0.65 | -35.5 |
| 14. Maize processing | 0.81 | -12.6 |
| 15. Coffee processing | 0.96 | 11.6 |
| 16. Sugar processing | 0.79 | -22.2 |
| 17. Vegetable oils | 1.03 | 25.8 |
| 18. Food for animals | 1.01 | -3.7 |

continued

*Banco de México, Indicadores Económicos (Mexico City), various issues.

Table 1 (continued)

| Branch | DRC | ERP a/ |
|--|------|--------|
| 19. Other foods | 1.04 | 21.0 |
| 20. Alcoholic drinks | 0.92 | 67.0 |
| 21. Beer | 0.67 | -5.0 |
| 22. Soft drinks | 0.43 | -37.8 |
| 23. Tobacco | 0.31 | -28.7 |
| 24. Spinning and weaving (soft fibre) | 0.80 | -1.2 |
| 25. Spinning and weaving (hard fibre) | 1.08 | 21.7 |
| 26. Other industrial textiles | 0.89 | 7.8 |
| 27. Clothing | 1.25 | 61.2 |
| 28. Leather products | 1.01 | 20.9 |
| 29. Saw milling | 1.09 | 27.3 |
| 30. Other wood products | 1.11 | 37.5 |
| 31. Paper | 1.14 | 41.7 |
| 32. Printing and editing | 0.73 | -7.6 |
| 33. Petroleum refining | 0.47 | -35.6 |
| 34. Petrochemicals | 0.67 | -7.9 |
| 35. Basic chemicals | 1.07 | 25.5 |
| 36. Fertilizers | 1.07 | -60.8 |
| 37. Synthetic resins and artificial fibres | 2.47 | 189.2 |
| 38. Medical products | 0.91 | 20.2 |
| 39. Soaps, detergents and cosmetics | 0.90 | 11.4 |
| 40. Other industrial chemicals | 1.46 | 73.3 |
| 41. Rubber products | 1.27 | 57.4 |
| 42. Plastics | 1.74 | 128.4 |
| 43. Glass | 0.83 | 1.2 |
| 44. Cement | 0.79 | -3.1 |
| 45. Other non-metallic minerals | 0.94 | 11.9 |
| 46. Iron and steel | 0.94 | 10.0 |
| 47. Non-ferrous metals | 1.01 | 22.6 |
| 48. Metal furniture | 1.14 | 52.3 |
| 49. Structural metal products | 0.92 | 19.5 |
| 50. Other metal products | 0.98 | 29.5 |
| 51. Non-electrical equipment | 1.16 | 42.9 |
| 52. Electrical equipment | 1.12 | 35.3 |
| 53. Domestic electrical goods | 1.32 | 65.4 |
| 54. Electronic equipment | 1.96 | 140.1 |
| 55. Other electrical goods | 1.54 | 83.1 |
| 56. Automobiles | 2.03 | 168.2 |
| 57. Body and parts for automobiles | 0.97 | 14.7 |
| 58. Other transport equipment | 1.19 | 37.6 |
| 59. Other manufactures | 1.34 | 63.8 |

Note: See text for explanation of calculations.

a/ Percentage.

Table 2. Structure of manufacturing production, 1960, 1970, 1980 and 1985

| Type of product | Percentage share | | | |
|-------------------------------|------------------|------|------|------|
| | 1960 | 1970 | 1980 | 1985 |
| Non-durable consumer goods a/ | 52 | 46 | 41 | 42 |
| Industrial intermediates b/ | 35 | 36 | 38 | 40 |
| Durable consumer goods c/ | 6 | 9 | 12 | 11 |
| Capital goods d/ | 7 | 9 | 9 | 7 |

Source: Secretaria de Programación y Presupuesto, Sistema de Cuentas Nacionales, Mexico City (various issues).

Note: In the footnotes to this table, numbers in brackets refer to branch numbers in the Mexican national accounts.

a/ Food, drink and tobacco (11-23); clothing and leather (26-28); printing and publishing (32); medical products and cosmetics (38-39); and other manufactures (59).

b/ Textiles (23, 24); wood 29, 30); paper (31); petroleum and industrial chemicals (33-37, 40); rubber, plastic, glass and cement (41-45); iron, steel and non-ferrous metals (46, 47).

c/ Electrical goods (53-55) and motor vehicles, parts and other transport equipment (56-58).

d/ Metal products (48-50) and electrical and non-electrical machinery (51, 52).

From these results, it appears that in 1980, approximately half of manufacturing, in value terms, was being produced inefficiently, and only 23 out of 49 branches were efficient. Furthermore, there was a tendency for relatively simple consumer goods production to be both less protected and more efficient than other forms of manufacturing and for consumer durables to be both more highly protected and less efficient than other manufacturing.

The average DRC for consumer durables was influenced strongly by the high DRCs for automobiles and electronic equipment, both branches being large and highly inefficient. Within the capital goods category, fabricated metal products were efficient, while the machinery producing branches, both electrical and non-electrical, had DRCs of around 1.15. This is a significantly lower degree of inefficiency than is found for most consumer durable activities.

As might be expected, there is a close correlation between the level of protection as measured by the ERP and the DRC indicator of economic efficiency. When an activity is highly protected, its net foreign-exchange saving will appear low relative to its domestic value added. The use of shadow prices to revalue domestic factors

Table 3. Summary of DCR results, 1980

| Categories a/ | DRC weighted b/ average | ERP weighted b/ average (%) | Number of branches | | Percentage share of output | |
|-------------------|-------------------------------|-----------------------------------|-----------------------|-------------|-------------------------------|-------------------------|
| | | | Efficient c/ | Inefficient | Efficient c/ branches | Inefficient branches |
| Non-durable | | | | | | |
| consumer goods | 0.91 | 13.3 | 13 | 7 | 60 | 40 |
| Industrial | | | | | | |
| intermediates | 1.10 | 33.4 | 7 | 11 | 51 | 49 |
| Consumer durables | 1.62 | 102.5 | 1 | 5 | 22 | 78 |
| Capital goods | 1.08 | 36.8 | 2 | 3 | 38 | 62 |
| All manufacturing | 1.08 | 33.8 | 23 | 26 | 50 | 50 |

a/ See table 2 for the branches included in these categories.

b/ Weights are the share of branches in output value in each category in 1980.

c/ An efficient branch is where DRC is below 1.0.

and non-traded inputs can, to some extent, offset this. However, in these results, highly protected branches also tend to have high DRCs. The correspondence between the ranking of branches by DRC and ERP measures is not exact, but the Spearman rank correlation coefficient of 0.89 is both relatively high and significant at the 5 per cent level. It is also worth noting that the ranking of branches by ERP derived here is relatively similar, but not identical, to the ranking by ERP for 1980 in the national industrial plan [13]. However, the ERP estimates of this study are generally lower than those published in the plan.*

D. Interpretation of DRC results

The main implication of these results is that, in 1980, much of Mexican manufacturing was inefficient by international standards, and that, in general, the largest number of efficient branches were to be found within the category of non-durable consumer goods, covering more traditional, less technologically sophisticated products. This finding is clearly in line with the interpretations of industrialization in Mexico and elsewhere as being based on premature "secondary import substitution", with the production of relatively complex capital-intensive products, at a low scale of production and with high unit costs [17]. However, it should be noted that these results do not support any simple interpretation of comparative advantage, in terms of greatest efficiency being found in labour-intensive commodities. A ranking of branches by DRCs and labour intensity, as measured by the share of wages in total value added, reveals no significant correlation.** Comparative efficiency requires, therefore, a more sophisticated explanation than simply the degree of labour intensity of a product. Factors like familiarity with a technology, learning-by-doing in production and using local raw materials are likely to be important, in addition to questions of labour and capital intensity.

The results should be treated as approximate and no more than broadly indicative of differential levels of efficiency within manufacturing in 1980. Since in applied planning work it is sometimes argued that results such as these can be used as a guide for future resource allocation, it may be useful to stress the limitations of this exercise, which illustrate the general problem of using ex-post DRC calculations of this type for prescriptive purposes.

*The Spearman rank correlation coefficient for branch ranking by these ERP estimates and those of the plan is 0.82 and is significant at the 5 per cent level. The plan document does not make clear the data or the methodology used for its ERP estimates, so that the source of difference from the results reported here cannot be identified.

**The Spearman rank correlation coefficient is 0.03 and not significant at the 5 per cent level.

E. Limitations of the analysis

These can be discussed both as data and as conceptual problems. From the data point of view, this study works with a number of approximations; these are often the type of adjustments that have to be made for lack of more detailed information. For example, it is typically the case that data on divergences between world and domestic prices for traded outputs and inputs will only be known very approximately whenever import demand is regulated by various forms of quantitative restrictions. This study used estimates of tariff equivalents taken from the national plan document, but it was not possible to check their accuracy. In addition, shadow-price adjustments to the numerator of DRC in principle require a detailed set of conversion factors, the estimation of which is itself a major research exercise. As was pointed out above, this study uses only approximate conversion factors. Perhaps the main concern over the data in these calculations relates to the treatment of capital costs in the numerator of the ratio. In theory, for a long-run DRC, an annualized capital charge is required to reflect the opportunity cost of committing resources to the particular activity. This capital charge will be determined by the replacement cost of assets, their working life and the economic discount rate, which reflects returns foregone elsewhere. Data on replacement costs of assets are particularly difficult to obtain, unless one is examining a specific new project for which there is a feasibility study. Here, in the absence of any indication of replacement costs per branch, the category "operating surplus" is used as a proxy for the annual capital charge. This shortcut has the potentially significant drawback that it associates profits earned with the cost of committing capital to an activity. This assumes that only normal profits, reflecting returns foregone elsewhere, are generated and, therefore, that no activity earns more or less than a normal rate. However, where monopoly returns are being earned, for example, as a result of the protection from foreign competition through the import controls system, this will result in high profits that will be included in the DRC calculation as a high capital charge, even if the actual capital charge is significantly lower. As a result of this way of estimating the capital charge, some of the high DRC results obtained here may simply reflect high profitability in protected activities. The significant positive correlation between the ERP and DRC indicators has already been commented on, and it is likely to be due in part to this way of estimating capital costs.

To illustrate the sensitivity of the results to the treatment of capital charges, table 4 shows DRCs for each branch under two different assumptions: the first being that the actual capital charge is 75 per cent of "operating surplus"; and the second being that it is 50 per cent. In other words, in case 1, the capital cost used in the initial calculations is reduced by 25 per cent and in case 2, by 50 per cent. This treatment assumes that the error in assessing the capital charge is in overrather than underestimates. There may, however, be some branches where low or negative profits are being made, so that "operating surplus" fails to cover the actual capital charge.

Table 4. Sensitivity analysis of DRC results

| DRC | Initial calculation | Alterations a/ | | |
|--------|---|----------------|---------|---------|
| | | Case 1 | Case 2 | |
| Branch | | | | |
| 11. | Meat and dairy products | 1.21 | 1.07 | 0.93 b/ |
| 12. | Fruit products | 0.84 | 0.77 | 0.70 |
| 13. | Wheat processing | 0.65 | 0.55 | 0.46 |
| 14. | Maize processing | 0.81 | 0.65 | 0.48 |
| 15. | Coffee processing | 0.96 | 0.78 | 0.61 |
| 16. | Sugar processing | 0.79 | 0.66 | 0.54 |
| 17. | Vegetable oils | 1.03 | 0.90 b/ | 0.76 b/ |
| 18. | Food for animals | 1.01 | 0.86 b/ | 0.71 b/ |
| 19. | Other foods | 1.04 | 0.90 b/ | 0.75 b/ |
| 20. | Alcoholic drinks | 0.92 | 0.78 | 0.65 |
| 21. | Beer | 0.67 | 0.59 | 0.52 |
| 22. | Soft drinks | 0.43 | 0.39 | 0.35 |
| 23. | Tobacco | 0.31 | 0.26 | 0.22 |
| 24. | Spinning and weaving (soft fibre) | 0.80 | 0.71 | 0.61 |
| 25. | Spinning and weaving (hard fibre) | 1.08 | 0.88 b/ | 0.68 b/ |
| 26. | Other industrial textiles | 0.89 | 0.77 | 0.65 |
| 27. | Clothing | 1.25 | 1.08 | 0.92 b/ |
| 28. | Leather products | 1.01 | 0.91 b/ | 0.80 b/ |
| 29. | Saw milling | 1.09 | 0.96 b/ | 0.83 b/ |
| 30. | Other wood products | 1.11 | 0.95 b/ | 0.80 b/ |
| 31. | Paper | 1.14 | 0.99 b/ | 0.83 b/ |
| 32. | Printing and editing | 0.73 | 0.65 | 0.57 |
| 33. | Petroleum refining | 0.47 | 0.44 | 0.40 |
| 34. | Petrochemicals | 0.67 | 0.64 | 0.61 |
| 35. | Basic chemicals | 1.07 | 0.94 b/ | 0.81 b/ |
| 36. | Fertilizer | 1.07 | 0.90 b/ | 0.73 b/ |
| 37. | Synthetic resins and artificial fibres | 2.47 | 2.18 | 1.89 |
| 38. | Medical products | 0.91 | 0.82 | 0.73 |
| 39. | Soaps, detergents and cosmetics | 0.90 | 0.79 | 0.67 |
| 40. | Other industrial chemicals | 1.46 | 1.27 | 1.09 |
| 41. | Rubber products | 1.27 | 1.12 | 0.98 b/ |
| 42. | Plastics | 1.74 | 1.54 | 1.37 |
| 43. | Glass | 0.83 | 0.73 | 0.63 |
| 44. | Cement | 0.79 | 0.70 | 0.61 |
| 45. | Other non-metallic minerals | 0.94 | 0.79 | 0.63 |
| 46. | Iron and steel | 0.94 | 0.83 | 0.71 |
| 47. | Non-ferrous metals | 1.01 | 0.88 b/ | 0.75 b/ |
| 48. | Metal furniture | 1.14 | 1.05 | 0.95 |
| 49. | Structural metal products | 0.92 | 0.82 | 0.72 |
| 50. | Other metal products | 0.98 | 0.88 | 0.78 |
| 51. | Non-electrical equipment | 1.16 | 1.02 | 0.89 b/ |
| 52. | Electrical equipment | 1.12 | 1.01 | 0.90 b/ |

continued

Table 4 (continued)

| DRC | Initial calculation | Alterations a/ | |
|------------------------------------|---------------------|----------------|---------|
| | | Case 1 | Case 2 |
| 53. Domestic electrical goods | 1.32 | 1.20 | 1.08 |
| 54. Electronic equipment | 1.96 | 1.78 | 1.59 |
| 55. Other electrical goods | 1.54 | 1.36 | 1.17 |
| 56. Automobiles | 2.03 | 1.84 | 1.66 |
| 57. Body and parts for automobiles | 0.97 | 0.87 | 0.77 |
| 58. Other transport equipment | 1.19 | 1.10 | 1.01 |
| 59. Other manufactures | 1.34 | 1.16 | 0.97 b/ |

a/ In case 1, capital charge is 75 per cent of that in initial calculations; in case 2, capital charge is 50 per cent of that in initial calculations.

b/ Branches that are inefficient in the initial calculations, but which become efficient with the new treatment of capital costs.

From table 4 it can be seen that in case 1, 11 branches that were inefficient in the initial calculations become efficient, whereas in case 2, 18 previously inefficient branches become efficient. The broad degree of difference between the three calculations reported here can be seen by the fact that, whereas in the initial calculations, in terms of output value, approximately 50 per cent of the manufacturing sector is found to be inefficient, the proportion drops to 33 per cent in case 1 and 17 per cent in case 2. Although there is clearly a core of branches that remain inefficient despite these changes to capital costs, the results indicate a considerable degree of sensitivity to the treatment of capital in the assessment of many branches and underline the uncertainty associated with the exercise.

In conceptual terms, the DRCs calculated here also have several limitations. From an ex-ante planning perspective, it is important to note that these DRCs are averages over a branch and normally cover a range of enterprises. Averages can mask a wide range of differing levels of efficiency within a branch, so that a high branch average need not imply that no new viable projects exist within that branch. In addition, estimates of this type will not normally incorporate external effects nor dynamic influences like learning or technical change that can alter efficiency over time. External effects from manufacturing can be either positive or negative, although much of the early literature on industrialization in developing countries stressed their positive side [18]. In principle, such effects can be included in DRC as either extra positive or negative items in the numerator. A positive externality, for example, should be deducted from the domestic resources in the numerator, since it is an additional benefit that partially offsets the use of these resources. Similarly, a negative externality is an additional cost and should be added to the costs of

the domestic resources involved. Here, as in most other DRC calculations, such effects are ignored, on the grounds that they are very difficult to quantify and to link with particular branches. The seriousness of this omission is likely to vary between branches and may be more important for engineering-based production, particularly of machine tools and simple equipment, since it is often argued that positive external effects, through the diffusion of technical progress, are more likely to be associated with these branches [19].

Most fundamentally, perhaps, there is the issue of changing efficiency over time. DRC estimates are typically for a point in time, and if learning and technical change are important, it is not inevitable that activities that are high cost at one point in time will always be so. Some evidence of the potential for changing efficiency over time can be drawn from the emergence of significant manufactured exports from Mexico during the 1980s. Manufactured exports rose from around 7 per cent of manufacturing output in 1980 to over 23 per cent by 1986.* Many of these manufactured exports were non-traditional, in the sense that they came from metal products and equipment branches that had previously exported relatively little. In some instances, major exports appear to have emerged from branches such as "automobiles" and "electrical equipment" that are found to have relatively high DRCs in 1980. In part, it is likely that these new exports emerged in response to recession in the internal market, combined with a significant real devaluation of the exchange rate. However, the speed with which some previously protected branches shifted to export sales indicates a capacity to respond to new situations.

F. Conclusions

In this paper, DRC estimates are given for Mexican manufacturing in 1980, disaggregated to the level of 49 branches. It is suggested that despite the limitations of these figures, they can be taken as broadly indicative of the pattern of economic efficiency at that time. However, caution is urged against the uncritical use of results of this type for future resource allocation. Single-period branch-level DRC indicators are inferior to detailed project-level calculations as a guide to investment allocation.

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SOMMAIRE

Evolution recente des courants d'investissements directs étrangers vers les pays européens membres du Conseil d'assistance économique mutuelle

Secrétariat de l'ONUDI

Le présent article traite de l'ampleur et de la structure des récents courants d'investissements directs étrangers vers les pays européens membres du Conseil d'assistance économique mutuelle (CAEM), eu égard aux éléments suivants : législations nouvelles; pays d'origine; importance et mode d'organisation des coentreprises et entrées de capitaux par branche industrielle. Parmi les traits notables, on relève : l'expansion dans des domaines d'activité technologiquement assez complexes; la tendance à attacher une importance accrue au potentiel d'exportation; l'expansion dans les activités tertiaires; l'importance décroissante des écarts de coûts de main-d'oeuvre; l'accroissement des investissements directs étrangers réalisés par les entreprises de moyenne, voire de petite taille; l'intensification de la concurrence entre pays susceptibles d'accueillir des investissements directs étrangers. Les incidences possibles de ces phénomènes pour les pays en développement sont examinées.

Sous-traitance dans la petite industrie : l'exemple de Sri Lanka

Sriyani Dias

Cet article étudie la portée, la nature et les effets des rapports de sous-traitance entre petites et grandes entreprises sri-lankaises. En règle générale, les relations entre la grande industrie et la petite sont faibles, bien qu'on note certains liens solides avec quelques grandes firmes bien implantées. La faiblesse de ces liens tient principalement à l'incapacité des petites entreprises de satisfaire aux exigences des grandes entreprises sur les plans de la technologie, des coûts de production, de la qualité et des services de livraison. La mise au point d'un système efficace de sous-traitance passe par l'adoption par le gouvernement d'une politique et de programmes d'appui visant à promouvoir et à développer les relations interindustrielles. La priorité devrait aussi être donnée au développement de l'esprit d'entreprise.

Le secteur des biens d'équipement au Ghana : options pour le développement économique et technologique

Erik Baark

Le développement des capacités technologiques locales est lié à la dépendance vis-à-vis des importations de biens d'équipement, et c'est dans ce cadre que sont examinées les options dont dispose le Ghana pour promouvoir les industries des biens d'équipement. L'évolution de la politique industrielle, du secteur des biens d'équipement proprement dit et de la production "informelle" de biens d'équipement est examinée. L'infrastructure technologique

locale est faible; les institutions à vocation technologique ne sont guère reliées entre elles; une politique technologique bien définie et des ressources financières suffisantes font défaut. De nombreuses propositions visant à renforcer la base technologique sont présentées.

Application de l'indicateur de coût en ressources intérieures
à l'industrie manufacturière mexicaine

John Weiss

Le coefficient de coût en ressources intérieures mesure l'efficacité économique statique : le montant des devises gagnées grâce à la fabrication de produits exportables ou économisées grâce au remplacement des importations par des produits de fabrication locale est comparé au coût des ressources intérieures consommées. Après l'explication des différentes manières d'utiliser ce concept et leurs incidences, on présente le coefficient estimatif de coût en ressources intérieures pour 49 branches manufacturières mexicaines en 1980 ainsi que des estimations du taux effectif de protection. Sur ces 49 branches, 23 seulement sont considérées comme efficaces, la plupart d'entre elles produisant des biens de consommation non durables et technologiquement peu complexes. A l'avenir, la politique de répartition des investissements devra cependant tenir compte de considérations dynamiques. Certains problèmes relatifs aux données sont examinés, et il est fait appel à l'analyse de sensibilité.

EXTRACTO

Últimas tendencias de los flujos de inversiones extranjeras directas hacia países europeos miembros del Consejo de Asistencia Económica Mutua

Secretaría de la ONUDI

En esta monografía se examinan la magnitud y la estructura de los últimos flujos de inversiones extranjeras directa hacia países europeos miembros del Consejo de Asistencia Económica Mutua (CAEM), especialmente en lo que atañe a nueva legislación, países de origen, importancia y organización de las empresas conjuntas y entrada de inversiones por ramas industriales. Entre los rasgos que empiezan a perfilarse figuran: la expansión hacia actividades tecnológicamente más sofisticadas; un mayor énfasis en el potencial de exportación; la expansión del sector de los servicios; la importancia decreciente de los diferenciales de costos de la mano de obra; el aumento de la inversión extranjera directa por parte de empresas medianas e incluso pequeñas; y una mayor competencia entre países receptores potenciales de inversiones extranjeras directas. Se examinan también las posibles consecuencias para los países en desarrollo.

La subcontratación en la pequeña industria:
el caso de Sri Lanka

Sriyani Dias

En este artículo se examina el alcance, la índole y los efectos de las actuales relaciones de subcontratación entre la pequeña y la gran industria de Sri Lanka. En general, los vínculos entre pequeña y gran industria son débiles, pero existen vínculos con algunas grandes empresas más organizadas. El principal motivo de la debilidad de estas relaciones es la incapacidad de la pequeña industria de satisfacer las exigencias de las grandes industrias desde el punto de vista de la tecnología, de los costos de producción, de la calidad y de los servicios de entrega. Con el fin de desarrollar un sistema de subcontratación eficaz, son necesarios programas de apoyo y políticas estatales de promoción y desarrollo de las vinculaciones interindustriales. Debe también concederse prioridad al fomento del espíritu de empresa.

El sector de los bienes de capital en Ghana: opciones
de desarrollo económico y tecnológico

Erik Baark

El desarrollo de las capacidades tecnológicas autóctonas está relacionado con la dependencia de las importaciones de bienes de capital, y las opciones que tiene Ghana para promover las industrias de bienes de capital se examinan en ese marco. Asimismo, se evalúan las novedades en materia de política industrial, el sector estructurado de bienes de capital y la producción de bienes de capital en el sector no estructurado. La base tecnológica autóctona es débil, las vinculaciones existentes entre las instituciones orientadas a la tecnología son escasas, no existe una política tecnológica claramente definida y se carece de recursos financieros suficientes. Se presentan numerosas propuestas para el fortalecimiento de la base tecnológica.

Aplicación del indicador de costos en recursos internos
al sector manufacturero mexicano

John Weiss

El ratio de costos en recursos internos es una medida de la eficiencia económica estática en que los beneficios, expresados en las divisas extranjeras obtenidas gracias a la producción de bienes de exportación, o ahorradas mediante la producción de bienes sustitutivos de las importaciones, se comparan con los costos en recursos internos empleados. Tras una explicación de las variaciones del concepto y de sus implicaciones, se ofrecen estimaciones de los costos en recursos internos correspondientes a 1980 y a 49 ramas industriales mexicanas, así como estimaciones de la tasa efectiva de protección. Sólo 23 de las 49 ramas estudiadas resultaron ser eficientes; en su mayor parte, producían bienes de consumo no duraderos y tecnológicamente no sofisticados. En la política futura con respecto a la dedicación de recursos de inversión habrán de tenerse en cuenta, no obstante, consideraciones de carácter dinámico. Asimismo, se examinan las dificultades relativas a los datos y se emplea el análisis de sensibilidad.

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