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## EXPORT PROCESSING ZONES IN TRANSITION

### The Case of the Republic of Korea\*

Prepared by the  
Regional and Country Studies Branch  
Industrial Policy and Perspectives Division

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PREFACE

This report has been prepared as part of UNIDO's Economic Research programme covering analyses and information of relevance to industrial policy-making in developing countries. In this programme, the Regional and Country Studies Branch is monitoring pertinent developments at the national and regional levels, in particular concerning industrial policies and programmes, emerging technological trends, demand changes in important markets, sub-sector issues and company strategies.

This report reviews the changing features of export-processing zones in the Republic of Korea, in particular as regards their linkage effects with the domestic economy. The aim is both to review past developments and to show emerging new trends which could be induced also in other developing countries.

The report has been prepared on the basis of brief data collection and analysis in the Republic of Korea in late 1986, desk research and data material available at UNIDO. It has been prepared by staff of the Regional and Country Studies Branch together with Prof. Derek Healey, University of Adelaide, as UNIDO consultant.

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List of Abbreviations

ARTEP	Asian Research Team for Employment Promotion
EPB	Economic Planning Board
EPZ	Export processing zone
ESCAP	Economic and Social Commission for Asia and the Pacific
FCIA	Foreign Capital Inducement Act
FDI	Foreign direct investment
FEPZ	Free export processing zone
FPI	Foreign portfolio investment
FTZ	Free trade zone
GDP	Gross domestic product
GNP	Gross national product
ILO	International Labour Office
IMF	International Monetary Fund
JV	Joint ventures
KDI	Korea Development Institute
KIMM	Korea Institute of Machinery and Metals
MAFEZ	Masan Free Export Zone
MTI	Ministry of Trade and Industry
OECD	Organisation for Economic Co-operation and Development
R&D	Research and development
ROK	Republic of Korea
UNCTAD	United Nations Conference on Trade and Development
UNCTC	United Nations Centre on Transnational Corporations
UNIDO	United Nations Industrial Development Organization



## Introduction: General Background and Purpose of the Study

The establishment of export-processing zones (EPZs) as a means to attract foreign investment and promote manufactured exports has become a widely applied industrial policy approach in a broad range of developing countries. The number of countries with EPZs in operation increased from some 10 in 1970 to some 35 in 1985. In the same period the number of EPZs rose from 10 to around 80. By 1985 approximately 1.3 million people were employed in these zones.<sup>1/</sup>

The role played by EPZs in promoting industrialization in developing countries has always been a controversial topic. Experience in many countries, in particular in East and Southeast Asia, has shown that these zones can contribute substantially to the generation and/or promotion of manufactured exports and to the provision of productive employment opportunities. However, they have more often than not been characterized by a concentration on only a few industrial branches, by using simple and fragmented production technologies, and by a lack of backward linkages with the domestic economy.

There have been remarkable success stories as well as drastic failures. Three different sets of factors have been the major determinants of EPZ performance in individual cases. Firstly, the international economic environment has exerted an important influence. Those EPZs established at a time of rapidly expanding international trade and at the beginning of the first wave of international restructuring and redeployment, benefitted from more favourable initial conditions than the 'latecomer'-EPZs set up in the eighties. Secondly, the domestic environment in terms of the level and structure of industrial development and the economic policy approach adopted have had an impact on the attractiveness and development potential of EPZs. Thirdly, a number of micro-level factors have been crucial including an EPZ's location, the available infrastructure and the efficiency of its administration. EPZs are thus a concept with many variations. They differ according to location and time. Indeed many zones have been gradually changing their features in response to a changing economic environment.

This being so, a case study approach would be required to assess the developmental impact of EPZs. By analyzing the specific reasons and

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<sup>1/</sup> The figures given here are by necessity imprecise. In the relevant literature any figure between 60 and 180 can be found for the total number of EPZs. This is mainly due to the widespread inclusion of free ports and to specific problems when it comes to counting industrial estates in countries with near-zone conditions (e.g. Hong Kong, Singapore). The present study adopts a narrow definition of EPZs. It does not intend, however, to contribute to definitional questions nor to provide yet another calculation of existing EPZs worldwide. On such overviews cf. Basile and Germidis 1984; Currie 1985a; UNCTAD 1985 and Kreye et al. 1987.

determinants of the performance of individual EPZs it may then be possible to derive certain structural preconditions for success and eventually to conceive corresponding policy recommendations.

The Republic of Korea was one of the first developing countries to embark on this specific approach to attract export-oriented foreign direct investment (Masan EPZ established 1971; Iri EPZ established 1974). Hence the country's EPZs have gone through the infancy stage of their life cycle and reached a certain level of maturity. Which have been the preconditions and determinants of their success? What has been the role and impact of domestic economic policies? How can the advanced Korean EPZs meet the challenges of a changing economic environment? A review of their achievements may provide valuable information on the actual developmental impact and the gradual transformation of the zones. The findings are expected to be relevant for other developing countries in designing policy measures to enhance the longer-term spin-offs and the catalytic role of EPZs for overall industrial development. While the concrete issues and tasks ahead in the Korean case may be immediately relevant only for a few other developing countries it becomes clear that EPZs should be conceived as being constantly in transition. They are not a static concept, not a once-for-all investment but a dynamic mechanism that needs to react to changing external demands.

The study proceeds along the following lines. Chapter I starts with a brief overview of the general economic development policy of the Republic of Korea and the special role and objectives assigned to EPZs within this framework. Subsequently, in chapter II, the actual performance of the Korean EPZs is analyzed in terms of various criteria (e.g. investment, employment, exports, profitability etc.). The focus will, however, clearly be on examining the extent and potential of backward linkages between EPZ enterprises and the domestic economy, primarily in terms of material inputs and of subcontracting activities (chapter III). Chapter III also attempts to draw some conclusions regarding the crucial determinants of linkage creation, in particular as to the question whether they have primarily been market-induced or policy-induced. Chapters IV and V finally consider the future role and functions of EPZs in the Republic of Korea and some of the lessons that the Korean case may hold for other developing countries.

## I. ESTABLISHMENT OF EPZs IN THE REPUBLIC OF KOREA

### 1. General economic framework<sup>1/</sup> and justification for EPZs

From a war-impooverished, rural based country in the 1950, the Republic of Korea has developed into one of the world's economically most dynamic countries with a long-term annual growth of GNP per capita of 6.6 per cent (1965-84) attaining in 1987 a GNP per capita of about \$2,900. The Sixth Five-Year Plan (1987-91) envisages a further increase to \$3,800 by the end of the plan period.

Hence, the Republic of Korea - apart from Hong Kong and Singapore as city economies with exceptional development preconditions - is in a leading income position among all Asian developing economies second only to Taiwan Province of China.

The rapid transformation from an agricultural country to a semi-industrialized nation during the last two decades has led many economists to consider the Republic of Korea as a model case of economic development on the basis of an export-oriented economic strategy. Since the early 1960s the main feature of the country's economic strategy has been its outward-looking, industry-oriented policies and measures. The average long-term growth rates of GDP (10.0 per cent 1965-73, 7.2 per cent 1973-84) indicate that the country has been able to cope with the major challenges confronting economies heavily reliant on manufactured exports for the world market, particularly the persistent need for structural changes to exploit new opportunities in the international economy. Yet the Republic of Korea does not dispose of any significant natural resources (excepting moderate reserves of coal). In consequence, import requirements have always been very high and have pushed the country into export production.

Given the country's poor natural resource endowment, the successful economic performance over the past two decades must be attributed to the efficient use of investment capital, the industriousness and work commitment of the country's labour force, and the nature of economic organization. The Government accords high value to the education system; its share in total government expenditure amounted to 20 per cent in 1986. Industry-related research and development is vigorously pursued as it is seen to hold the key for the country's economic future.

The sectoral structure of GNP has altered sharply during the recent decades of high sustained economic growth (Table 1). With the share of agriculture decreasing from 29.3 to 13.8 per cent between 1970 and 1986, manufacturing has proven to be the economy's most dynamic sector. In each year save for 1982 and 1985, manufacturing has increased its relative importance: over the whole period its GDP share rose from 15.4 to 33.3 per cent. The Republic of Korea is now one of the few countries in the world with a share of manufacturing in GNP of above 30 per cent. Apart from agriculture, a relative decline was experienced by the services sector (from 45.3 to 39.6 per cent). Utilities and particular construction (which accounted for 8.6 per cent of GNP in 1986) have both gained in importance.

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<sup>1/</sup> The general synopsis given here of the Korean economic performance and policy approach draws on UNIDO 1987a.

Table 1. Republic of Korea: Distribution of GNP by sector of origin (at 1980 constant market prices), 1970, 1975, 1980-86 (percentage)

Year	Agriculture <sup>a/</sup>	Mining & quarrying	Manu- facturing	Construction	Utilities	Services
1970	29.3	2.1	15.4	7.0	1.3	45.3
1975	24.4	2.0	22.8	6.8	1.3	42.8
1980	15.1	1.4	30.6	8.6	2.1	42.2
1981	17.3	1.6	30.8	7.8	2.2	40.4
1982	16.9	1.5	30.5	8.7	2.1	40.2
1983	16.1	1.5	30.6	9.3	2.5	40.1
1984	14.9	1.5	32.4	9.1	2.8	39.3
1985	14.8	1.5	31.9	9.0	3.2	39.6
1986 <sup>b/</sup>	13.8	1.4	33.3	8.6	3.4	39.6

Source: EPB, Major Statistics of the Korean Economy 1987.

a/ Incl. forestry and fishing.

b/ Provisional.

Following the adoption of an outward-looking development strategy in the early sixties, exports have become the engine of Korea's industrial development.<sup>1/</sup>

The close interlinkage of the Korean economy with the world economy is reflected by the high share of foreign trade in the country's GNP (Table 2). While the import share increased from 22.6 to 30.5 per cent between 1970 and 1986, the export share more than trebled in the same period to reach a level of 34.8 per cent. Total foreign trade thus reached 65.3 per cent of GNP in 1986. Both the trade balance and the current account balance remained in deficit throughout the seventies and first half of the eighties. Throughout the present decade, however, both the trade and current account deficits as shares of GNP have fallen and by 1986 they were in surplus.

To arrive at a clear understanding of the Korean economic strategy (which has often been described in rather simplistic terms) two of its salient features are outlined below.

Firstly, the rapid export expansion was not only preceded but in fact accompanied by import substitution efforts. It was only when the benefits of early import substitution started to decline that the country adopted its outward-looking policies in the early sixties. However, import substitution subsequently (as of the early seventies) moved into heavy and chemical industries which only in the wake of the 1973 'oil shock' and the resulting balance-of-payments pressure became partly reoriented towards export markets.

<sup>1/</sup> Korea's total exports can almost be equated with manufactured exports - the latter accounted for more than 95 per cent of the former in 1984.

Table 2. Republic of Korea: GNP shares of exports, imports and current account balance (at current prices) 1970, 1975, 1980-86

Year	Export share	Import share	Exports plus imports as per cent of GNP	Share of trade balance	Share of current account balance
1970	11.0	22.6	33.6	-11.6	-7.8
1975	23.9	31.9	55.8	-8.0	-9.0
1980	28.5	35.8	64.3	-7.3	-8.8
1981	31.2	36.7	67.9	-5.5	-7.0
1982	30.1	33.9	64.0	-3.7	-3.8
1983	30.5	32.9	63.4	-2.3	-2.1
1984	32.7	34.0	66.7	-1.3	-1.7
1985	30.4	30.4	60.8	0.0	-1.0
1986	34.8	30.5	65.3	4.3	4.8

Source: Calculated from EPB, Major Statistics of Korean Economy 1987.

Secondly, there has always been a substantial state involvement in organizing, focussing and directing economic development. Contrary to widespread allegations the Republic of Korea has never been a paradigm for a free market laissez-faire approach to development; the Government has, however, tried to use market signals in shaping its economic policy.

Hence, the system of medium-term indicative planning ("administrative guidance") has been of basic importance to the country's economic achievements. The centrepiece of a sophisticated ensemble of incentives has been the financial system which, in virtually no other developing country, has been so purposefully designed and systematically utilized as an instrument for targeted industrial development. Moreover, the country's economic success has been essentially due to specific forms of public/private sector institutional interlinking. Similar to the Japanese industrial policy approach, market signals have been used to guide strategic decisions without, however, leaving industrial development entirely to the unrestricted working of market forces.

Yet harnessing the financial sector for industrial development was only one of several major areas of industrial policy. Further measures have included fiscal incentives (tax exemptions and reductions; accelerated depreciation allowances; tariff exemptions for and tax rebates on imports required for export production), protective measures (quantitative import restrictions and import prohibitions on domestically produced items) as well as direct government investment in industrial estates and EPZs. Most of these incentives were particularly aimed at export promotion.

A list of 24 types of export incentives offered by the Government of the Republic of Korea is presented below.<sup>1/</sup> These were in operation at different times from 1950-1975 and, in many cases, beyond 1975. Since it is important from the point of view of this study to determine in which ways

<sup>1/</sup> Cf. Krueger 1979, p. 93.

and to what extent EPZ incentives differed from general export incentives in the economy the list is reproduced below:

1959-75	Tariff exemptions on imports of raw materials and spare parts
1965-75	Tariff and tax exemptions granted to domestic suppliers of exporting firms
1961-72	Domestic indirect and direct tax exemptions
1966-75	Accelerated depreciation
1965-75	Wastage allowance subsidies
1951-55)	Import entitlement linked to exports
1963-65)	
1957-75	Registration as an importer conditional on export performance
1967-75	Reduced rates on public utilities
1950-61	Dollar-denominated deposits held in Bank of Korea by private traders
1967-71	Monopoly rights granted in new export markets
1965-75	Korean Trade Promotion Corporation
1955-56)	Direct export subsidies
1961-64)	
1962-75	Export targets by industry
	Credit subsidies:
1950-75	Export credits
1950-1954)	Foreign exchange loans
1971-1975)	
1959-75	Production loans for exporters
1950-75	Bank of Korea discount of export bills
1964-75	Import credits for exporters
1964-75	Capital loans by medium industry bank
1964-75	Offshore procurement loans
1965-75	Credits for overseas marketing activities.

The first of the incentives listed above, and probably the most important - tariff exemptions on imports of raw materials and spare parts - is the sine qua non of EPZs. However, this incentive to export was applied generally in the Republic of Korea from 1959 to 1975 in the form of tariff exemptions as imports for export production cleared customs. As of July 1975 the system was changed to one in which tariffs on these imports are paid at the time of importation but, through a customs drawback system,<sup>1/</sup> are refunded at the time of export. For about half of exports the drawback amount is the tariff that has actually been paid. For the other half, the drawback is calculated on a product-by-product basis and represents a weighted average of the levies (i.e. indirect taxes) paid on domestic inputs and imported inputs, the weights being proportional to the industry's average ratios of using domestic and imported inputs. Thus if an individual producer used relatively more of domestic inputs than the industry as a whole he would be overcompensated; this is an effective way of stimulating the use of domestic inputs.

All that has been said so far means that in the early seventies, i.e. by the time that EPZs were established, the Republic of Korea had already for

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<sup>1/</sup> A system by which import duties paid are refunded to the importer upon presentation of documentary evidence of payment. The refund is usually made on the export of the commodity incorporating the imported input.

quite some time embarked on a strong export promotion policy. In other words, EPZs were not assigned a vanguard role in initiating manufactured exports but came to be set up to complement and strengthen a generally prevailing export orientation of the economy. This appears to be especially noteworthy as in many other countries a different sequence was and is to be observed with EPZs being utilized as incubator to bring about a shift to export production - not always successfully so.

Masan EPZ began operations in 1971 and Iri EPZ in 1974; both had the older, simpler and more direct incentive built into their structure viz. imports of raw materials and components were completely free of tariffs. But, as will now be apparent, this concession is only a matter of degree since, effectively, all manufactures for export are produced without the payment of import duty on inputs. (One must bear in mind, however, the added complexity, and therefore cost to the producer and government of the drawback system. One of the costs to the producer represents the opportunity cost of the use of funds tied up for a period, monies which must initially be paid out in duties.)

Furthermore, tariff exemptions were (and are) granted to all firms producing for export in bonded factories located either within general industrial estates or, indeed, anywhere in the Republic of Korea.<sup>1/</sup>

In sum, one cannot conclude that the EPZs were established to make use of a previously unused system of export incentives or because that system was being phased out generally in the economy and was being transferred to the EPZs. A free trade regime applied to exports even prior to the establishment of the EPZs; it is summed up by Balassa as follows: "Exporters had the freedom to choose between domestic and imported inputs; they were exempted from indirect taxes on their output and inputs; and they paid no duty on imported inputs. The same privileges were extended to the producers of domestic inputs used in export production".<sup>2/</sup>

Given the success of its export policy why then did the Republic of Korea turn its attention towards the establishment of EPZs at all? What did it offer in particular which had not been previously available generally? The answer seems to be that it was the necessity to attract foreign direct investment to sustain the export momentum which loomed large in the policy-makers' minds. Towards the end of the sixties the view was developing that the early export successes were not going to last indefinitely: "Korean planners, much like their Japanese counterparts of the 'fifties, had begun to evince disquiet over the growth potential of light industries and Korea's future competitiveness in the face of rapidly rising real wage rates, and an onslaught from countries where labour was cheaper".<sup>3/</sup>

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<sup>1/</sup> See Annex A for a note on industrial estates, which were initiated in the early sixties, and Annex Tables A-1 and A-2 for statistics on the role of industrial estates and on bonded exports. It may be further noted that customs duties, special excise tax, and value added tax are not payable in respect of the importation of capital goods which are brought in by a foreign investor for his initial investment or which are imported by an enterprise in which a foreign investor invests through dividends received from foreign investment or through foreign exchange provided by the foreign investor. (Ministry of Finance 1986a, pp.22-23.)

<sup>2/</sup> Balassa 1985, p.149. (Author's emphasis).

<sup>3/</sup> Yusuf and Peters 1985, p.23.

For this reason it was decided to switch the developmental effort towards the next stage viz. basic process industries such as steel, chemicals, shipbuilding, machinery and transport. This shift in emphasis, towards a much more capital-intensive process of development, was coupled with the perceived necessity to devote capital resources to the defence industry following reduced U.S. assistance. To a large extent it was the private sector that was expected to invest in the heavy industries now to be developed - only the Pohang steel plant was in the public sector. To assist the private sector credit was extended by government-controlled financial institutions. It is true that the domestic savings rate had been increasing from 11.8 per cent in 1966 to 15.7 per cent in 1970<sup>1/</sup> but the demands about to be made on domestic and foreign savings were now becoming so large as to warrant the tapping of direct equity financing as a new source.

Direct equity financing can be made by foreigners in two ways: by foreign direct investment (FDI) and by the purchase of stock, i.e. foreign portfolio investment (FPI). In the case of the Republic of Korea, however, both types of capital inflow have never been used extensively. For instance, FDI has rarely amounted to more than 10 per cent of annual capital inflow and has, in fact, been frequently less than 5 per cent. FPI was small until the early 1980s when foreigners were permitted to purchase Korean stocks through mutual funds (the process was liberalized in 1986). One area which FDI could be attracted to was export production in the EPZs; inflows here would alleviate pressures on capital resources.

As mentioned before, the seventies saw a mushrooming growth of EPZs worldwide. Between 1971 (establishment of Masan EPZ) and 1975 (one year after establishment of Iri EPZ) alone 23 new EPZs were set up in 11 countries, mainly in Asia<sup>2/</sup>. It is highly likely, therefore, that the initiation of the system of EPZs in a world context stimulated many countries to follow suit if only for fear of losing out in acquiring a proportion of what was regarded as a fixed supply of foreign direct investment. Potential recipient countries were then placed in the classical "prisoner's dilemma" situation: when one country increases its incentives to attract foreign capital all will be obliged to do so and the competitive bidding for capital will result in the general level of incentives being higher than necessary (with rents being skimmed off by incoming capital) and with the final distribution of foreign capital among countries being no different from what it would have been with all-round lower incentives. However, in this scenario, the absence or lower level of incentives will affect international capital decision on location. The point is "that while the decision to relocate is generally independent of incentive policies, the latter nevertheless have some influence on the choice of host country".<sup>3/</sup>

To conclude this section: it can certainly not be claimed that the establishment of EPZs in the Republic of Korea was essential for the initiation of an export-oriented growth strategy; by the time Masan EPZ came

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1/ Cf. EPB 1987.

2/ Cf. Basile and Germidis 1984, pp.21-22.

3/ Basile and Germidis 1984, p. 58. Cf. on this point also Kraus and Lütkenhorst 1986, pp. 50-51.



into being in 1971 the country had experienced a decade of vigorous growth in GNP and exports. Two reasons for the establishment of EPZs thus remain: (i) to help maintain the rate of growth of exports in the face of enhanced domestic demands for capital-intensive projects which would not increase foreign exchange earnings in the short-term and (ii) to ensure that the Republic of Korea would get an appropriate share of whatever internationally-mobile private capital was available which otherwise would have been attracted to competing countries themselves engaged in establishing EPZs.

## 2. Role and objectives of EPZs

The Economic Planning Board in its Economic Survey for 1970 set out what it called an "Export Promotion Policy", introduced during 1969. Some twenty measures were listed, among them the following:

First, in order to modernize production facilities and to facilitate mass production:

- Three industries (cotton fabrics, woolen fabrics and raw silk) were excluded from designated export-oriented industries.....
- A total of \$60 million was made available through the Korean branches of foreign banks to export industries for procurement of equipments....
- To facilitate the establishment of free export zones including Masan, the Law on the Establishment of Free Export Zone was promulgated on 20 December 1969.

Secondly, in order to strengthen competitive power of export industries and to increase foreign exchange earnings;

- Utilization of domestically produced raw materials was given financial and administrative support.

Thirdly, in order to widen export markets .....

- Efforts to diversify export markets were made, developing new commodities and strictly inspecting export goods.

Fourthly, in order to strengthen financial and administrative support to export industries:

- Import of raw materials and equipment for export industries was exempted from customs, and their foreign exchange earnings were also exempted from internal taxes. Special accelerated depreciation was allowed to promote capital investment of export industries.
- Export-import link system and export subsidy were adopted by the Government, and administrative procedures were also simplified.
- Despite tight monetary policy and upper reserve base limits, as agreed upon with IMF, a maximum financial support was given to export financing.

**Fifthly, Foreign exchange credits were extended to develop designated export-oriented industries and to finance the conversion into export industries and the import of industrial facilities for export industries."**

The list puts the Masan and Iri EPZs into perspective; they were clearly established to be part of a package of new measures designed to stimulate exports. At the same time no specific mention is made of foreign investment in the Zones in the Foreign Capital Inducement Act (Law No.2598, promulgated on 12 March 1973)<sup>1/</sup> - the implication obviously being that investments made within the Zones are broadly within the scope of the Act. In fact, the language of the Act when dealing with the criteria for granting authorization for foreign investment is quite similar to the language used when outlining EPZ investment criteria with emphasis placed on high foreign exchange earnings, labour-intensive production processes and/or transfer of sophisticated technologies.

It appears that the criteria for investment in EPZs are quite broad as indeed they are for investment in the Republic of Korea generally where capital is welcomed which develops "key industries or public utilities" and which "contribute(s) to the development of the national economy and social welfare" (Act, p.61). The question thus emerges in what way/s EPZs in the Republic of Korea can be considered to be "special"? Not a great deal of attention is paid in official government publications or in the publications of commercial institutions to the special nature (if any) and operation of the EPZs and, often, where mention is made they are lumped in with "Industrial Estates" in general. Now, of course, an EPZ is an industrial estate but in the interest of clarity it is desirable to maintain the distinction.

Obviously, in the Korean context very little is special about EPZs. As has already been mentioned, their chief underpinning is the facility offered to firms within them to import inputs duty-free in the expectation that all output will be exported. But this possibility is also open to other factories in the country if they are "bonded" and, in any case, a customs drawback system operates in respect of imported inputs for exports. Certainly in the "free export zones generous tax incentives are provided for foreign-invested enterprises"<sup>2/</sup> - but they are so provided generally for foreign investors in the Republic of Korea (see Annex C for a summary). There are no extra tax incentives for firms establishing in the EPZs.

The next benefit claimed for operating in an EPZ is that all the administrative procedures necessary for operation of the occupant enterprises can be easily processed on the spot".<sup>3/</sup> It would seem, however, that

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1/ A revised FCIA became effective on 1 July 1984 but the main purpose remains the same. The essential difference is that under the old Act a Positive List System was operated under which foreign investment was permitted only in specific listed sectors; under the new, and more liberal Act, there exists a Negative List which excludes foreign investment from fairly limited specific areas of the economy, all the rest being automatically approved. For a summary of the provisions of the Law see UNIDO 1987a.

2/ Korea Exchange Bank 1984, p.149.

3/ Ibid., p.151.

similar provisions exist generally in industrial estates. In answer to the question: "What are the advantages of locating in an industrial estate?" the Ministry of Finance writes:

"All the enterprises located in industrial estates enjoy preferential advantages. Plant sites can be easily purchased or leased at considerably lower prices than in other areas. Further, various support facilities and services such as electric power, industrial water, transportation, telecommunication, stovedoring, and packing are provided. In addition, these estates offer a full range of infrastructure and other auxiliary services such as a customs office, a bank, a labour office, a quarantine station, and an immigration office."<sup>1/</sup>

Hence, it appears to be a fair assumption that services provided in all estates are similar. No doubt in practice there would be variations in the extent of the services and the efficiency with which they are provided; an extensive study would be needed, however, to ascertain this. What, then, remains as specific characteristics of EPZs in the Republic of Korea? It appears that this effectively boils down to (i) the waiving of certain laws and regulations and (ii) the existence of a 'one-stop' investment office:

"The zone functions as a bonded area where the implementation of laws and regulations pertinent to foreign investment, which are normally applied elsewhere, are waived or relaxed."<sup>2/</sup>

"The procedure for authorization of foreign investment is simplified and handled at an office in the zone."<sup>3/</sup>

As to the waiving/relaxation of specific laws and regulations it is not spelled out in detail what exactly this means. Presumably it is of greatest significance in connection with labour legislation (working hours, trade union activities, etc.). The existence of a 'one-stop' investment office was frequently commented on favourably by firm representatives within the EPZs. In practice it means that the potential investor is freed from the necessity to "make the rounds" of government authorizing departments and agencies in Seoul and of departments of local government.

To summarize the role and objectives of the Korean EPZs: Both Masan EPZ and Iri EPZ were set up to attract foreign capital for export-oriented industries. Their net foreign exchange earnings were expected to be high. Generally speaking it was labour-intensive industries which were attracted so that one of the other objectives of development - employment creation - could be achieved. To bring in foreign capital various incentives were offered but

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<sup>1/</sup> Ministry of Finance 1986b, p.38.

<sup>2/</sup> Ibid.

<sup>3/</sup> Ibid. No information is available as to whether the simplification involves anything more than the handling of the authorization procedure within the zone itself.

it seems that many of these incentives were also available to foreign capital locating elsewhere in the Republic of Korea - and especially in the general industrial estates which had been in existence since the early sixties. It is a moot point as to how much of the foreign capital attracted to the EPZs would have entered the country in any case, given the history of dynamic expansion since the beginning of the sixties and given the low wage rates, skilled labour force and relatively stable political environment which characterized the country. It may be that, in effect, part of the economic rents accruing to the projects undertaken were lost to the Korean Government through its provision of redundant incentives.<sup>1/</sup>

The following chapter reviews to what extent the EPZs have achieved their main objectives, viz. the attraction of foreign investors, the provision of industrial employment opportunities and the generation of net foreign exchange earnings.

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<sup>1/</sup> Two studies explicitly make a cost-benefit analysis of Masan EPZ. Boum Jong Choe (1975, p.248) estimated the marginal benefit-cost ratio to be between 1.24 and 2.34, depending on assumptions about the discount rate and the shadow wage rate. Peter Warr, (1984, p.183) calculated the internal rate of return at 5.9 to 15.0 per cent, depending on the wage differential between inside and outside the zone - effectively, again, the shadow wage rate - and assumptions on the life of the zone. Both results appear to be dependent on a number of assumptions which might or might not be correct. Moreover, by their nature, calculations of this sort do not deal with the counterfactual situation: what if the capital would have come in anyway and gone elsewhere in the economy?

## II. ANALYSIS OF SELECTED PERFORMANCE ELEMENTS

### 1. The firms: number and sectors

Tables 3 and 4 provide an overview of total investment (foreign plus domestic) and the number of firms in the two EPZs, Masan and Iri.<sup>1/</sup> Although 1970 is given as the starting date of Masan, production and exports did not effectively get under way until 1971. Iri commenced operations in 1974. In Masan's case the maximum number of firms in the zone, 115, was reached early, viz in 1973 (Table 3). Since then there has been a decline to 79 in 1985 and 78 in the first half of 1986. These bare numbers, unfortunately fail to provide a complete picture of the "ins" and "outs" during the period. Nor is any information available concerning the reasons for the withdrawal of firms.<sup>2/</sup> For Iri, the number of firms continued to grow to 20 in mid-1986, but, again, "ins" and "outs" are not known.

In current value terms cumulative total investment (foreign and domestic) in the two zones combined has increased year by year, so that by 1985 it was 54 per cent greater than, for instance, in 1974, the first year of the combined zones' existence. However, in real dollar terms cumulative investment has fallen. Depending on the deflator used (the GDP deflator or the wholesale price index) real cumulative capital investment in the two zones declined between 30 and 60 per cent.

The average size of firms, in terms of investment, has been and is small, ranging from \$0.24 million in 1971 to \$1.5 million in 1984 and 1986. But again, after deflating for price movements,<sup>3/</sup> the average size in real terms has declined by 55 per cent.

Table 4, based on end-June 1986 statistics, provides a branch breakdown of firms and investments. The two EPZs display distinctly different branch structures, with Masan being dominated by the electronics and electric branch and Iri by the textiles and garments branch. More specifically, in Masan 30 per cent of the firms and 58 per cent of investment are in the electronics and electric branch while in Iri textiles and garments account for 17 per cent of the firms and 53 per cent of investment. Taking the two Zones together, the electronics and electric branch ranks first: 25 per cent of the total number of firms and 52 per cent of total investment.

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1/ Hereafter, unless reference is made to the contrary, the names by themselves refer to the EPZs.

2/ It would, for instance, have been valuable to have ascertained whether firms which left the zones did so in order to locate elsewhere in the Republic of Korea - and what induced them to make that move - or whether they ceased their Korean operations altogether. An analagous statistic - again, apparently, on which MTI maintained no records - concerns the number, if any, of foreign firms which have applied to come into the zones but which have been turned away from lack of physical space. One would like to know whether, if such firms exist, they located or are deciding to locate elsewhere in the Republic of Korea.

3/ Using the wholesale price index.

Nevertheless, with metal activities accounting for 17 per cent and precision machinery for 9 per cent of all investment, the branch structure of the Korean EPZs is more diversified than that of most others worldwide.

Table 3. Masan and Iri EPZs: Number of enterprises<sup>a/</sup> and cumulative total investment, 1970-86

Year	Number of firms			Investment (\$ million.)		
	Masan EPZ	Iri EPZ	Total	Masan EPZ	Iri EPZ	Total
1970	4	-	4	1.8	-	1.8
1971	22	-	22	5.3	-	5.3
1972	70	-	70	36.9	-	36.9
1973	115	-	115	82.8	-	82.8
1974	110	1	111	88.9	2.3	91.2
1975	105	6	111	89.0	3.3	92.3
1976	99	14	113	98.0	5.3	103.3
1977	99	15	114	103.9	6.7	110.6
1978	97	14	111	111.9	6.7	118.6
1979	94	14	108	115.0	6.9	121.9
1980	88	12	100	112.9	7.5	120.4
1981	89	17	106	117.2	11.9	129.1
1982	83	16	99	116.2	11.8	128.0
1983	83	18	101	118.2	15.7	133.9
1984	79	19	98	128.2	16.8	145.0
1985	79	20	99	125.9	14.3	140.2
1986 <sup>b/</sup>	78	20	98	132.4	17.5	149.9

Sources: Jong-Nam Kim, Business Activities in the Korean Export Processing Zones, Table 3, Ministry of Trade and Industry, November 7, 1983 (mimeo), as updated by MTI, August 1986; Administration Offices of the EPZs.

a/ "Registered" enterprises. See note (f) to Table 4.

b/ As at 30 June for Masan; as at 31 May for Iri.

Table 4. Masan and Iri EPZs: Firms and investment by industrial branch (as at 30 June 1986)<sup>a/</sup>

Sector	Number of firms <sup>b/</sup>				Investment (\$'000)			
	Masan EPZ	Iri EPZ	Total	Per cent	Masan EPZ	Iri EPZ	Total	Per cent
Electronics and electric	23	1	24	25.3	76,107	1,384	77,492	51.7
Metal	16	1 <sup>c/</sup>	17	17.9	22,480	3,501	25,981	17.3
Precision machinery	8	-	8	8.4	13,840	-	13,840	9.2
Textiles and garments	8	8	16	16.8	5,424	9,184	14,607	9.7
Machinery	4	-	4	4.2	2,039	-	2,039	1.4
Footwear	5	-	5	5.3	6,543	-	6,543	4.4
Non-metal	5	4 <sup>d/</sup>	9	9.5	1,319	-	1,319	0.9
Leather	-	2 <sup>e/</sup>	-	-	-	2,270	2,270	1.5
Stone processing	-	3	3	3.2	-	908	908	0.6
Others	8	1	9	9.5	4,688	227	4,915	3.3
<b>Total<sup>f/</sup></b>	<b>77</b>	<b>18</b>	<b>95</b>	<b>100.0</b>	<b>132,440</b>	<b>17,475</b>	<b>149,915</b>	<b>100.0</b>

Sources: Ministry of Trade and Industry (MTI) and Administration Offices of Masan and Iri EPZs.

a/ The Iri figures refer to the 31 May 1986.

b/ Operating companies.

c/ In addition, one company is preparing to operate.

d/ In addition, one company is preparing to establish.

e/ At 31 March 1986 Iri EPZ had five companies in this category with a total investment of \$2.3 million of which \$1.5 million was foreign-owned capital.

f/ The total number of firms refers to operating companies, hence the slight discrepancy with Table 3 which refers to "registered" companies.

## 2. Investment: foreign and domestic

Tables 5 to 8 present data referring to investment, foreign and domestic, by country and sector. Comparisons are made between the structural patterns within the EPZs and those in the Republic of Korea. Emphasis is on Masan as e.g. the country breakdown of investors in Iri is not available.

Table 5 describes two main features of the investment situation in Masan:

Table 5. Masan EPZ: Investment by country, industrial branch and ownership pattern (as at 30 June 1986)  
Number of firms (in brackets) and \$'000

Sector	Japan			USA			Republic of Korea	Others			Total		
	Wholly Foreign	Joint Ventures	Total	Wholly Foreign	Joint Ventures	Total		Wholly Foreign	Joint Ventures	Total	Wholly Owned <sup>a/</sup>	Joint Ventures	Total
Electronics and Electric	70,554 (18)	728 (2)	71,283 (20)	1,500 (1)	423 (1)	1,923 (2)	-	-	2,901 (1)	2,901 (1)	72,054 (19)	4,052 (4)	76,107 (23)
Metal	6,929 (5)	8,143 (5)	15,072 (10)	-	550 (2)	550 (2)	6,858 (4)	-	-	-	13,787 (9)	8,693 (7)	22,480 (16)
Precision machinery	9,983 (4)	3,153 (3)	13,136 (7)	-	204 (1)	204 (1)	500 (1)	-	-	-	10,483 (5)	3,357 (4)	13,840 (9)
Textiles	-	1,109 (4)	1,109 (4)	-	-	-	4,015 (3)	-	300 (1)	300 (1)	4,015 (3)	1,409 (5)	5,424 (8)
Machinery	1,845 (3)	-	1,845 (3)	-	194 (1)	194 (1)	-	-	-	-	1,845 (3)	194 (1)	2,039 (4)
Footwear	2,430 (3)	-	2,430 (3)	-	2,474 (1)	2,474 (1)	1,639 (1)	-	-	-	4,069 (4)	2,474 (1)	6,543 (5)
Non-Metal	224 (1)	-	224 (1)	205 (1)	-	205 (1)	890 (3)	-	-	-	1,319 (5)	-	1,319 (5)
Others	3,685 (6)	1,004 (2)	4,688 (8)	-	-	-	-	-	-	-	3,685 (6)	1,004 (2)	4,688 (8)
<b>Total</b>	<b>95,650 (40)</b>	<b>14,137 (15)</b>	<b>109,787 (56)</b>	<b>1,705 (2)</b>	<b>3,845 (6)</b>	<b>5,550 (8)</b>	<b>13,902 (12)</b>	<b>-</b>	<b>3,201 (2)</b>	<b>3,201 (2)</b>	<b>111,257 (54)</b>	<b>21,183 (24)</b>	<b>132,440 (78)</b>

Source: Administration Office of Masan EPZ.

<sup>a/</sup> Includes Republic of Korea



- Japan is overwhelmingly dominant as a country source of investment accounting for 83 per cent of the total. With domestic Korean investors generating 11 per cent <sup>1/</sup> and the USA another 4 per cent of overall investment, just 2 per cent comes from further sources.
- The share of joint ventures in total investment is 16 per cent. On a sectoral basis, metal, footwear and textiles show the highest shares of joint ventures (with 39 per cent, 38 per cent and 26 per cent, respectively) whereas in the dominant electronics and electric field only 5 per cent of investment is in the form of joint ventures. On a country basis, Japanese investment is predominantly fully owned (87 per cent) whereas in the US case only a minority is fully US-owned (31 per cent). This clearly reflects different attitudes towards the perceived desirability or necessity of having a Korean partner.

Table 6 refers to Masan again and depicts the position at June 1986 with respect to the proportion of investment held in various sectors by different countries. Most Japanese investment clearly is made in the electronics and electric industry (65 per cent). On the other hand, US investment is concentrated in the footwear branch (45 per cent). The Republic of Korea has no investment in the electronics and electric branch, holding about one half of its total investment in the metal sector (of small importance in Masan to Japan and USA and of zero importance to other countries).

Table 6. Masan EPZ: Proportion of investment<sup>a/</sup> held in various industrial branches by country (as at 30 June 1986)  
(Per cent)

Sector	Japan	USA	Republic of Korea	Others	Total
Electronics and electric	64.9	34.7	-	90.6	57.5
Metal	13.7	9.9	49.3	-	17.0
Precision machinery	12.0	3.7	3.6	-	10.0
Textiles	1.0	-	28.9	9.4	4.1
Machinery	1.7	3.5	-	-	1.5
Footwear	2.2	44.6	11.8	-	4.9
Non-metal	0.2	3.7	6.4	-	1.0
Others	4.3	-	-	-	3.5
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Source: Table 5.

a/ Includes wholly foreign-owned and joint ventures.

1/ Only from 1980 onwards were Korean nationals permitted to own an occupant enterprise in its entirety (Kim 1981, p.3).

When comparing the structure of Masan investment with investment patterns in the whole Republic of Korea, it stands out that the relative role played by electronics and electric branches is much larger in Masan (58 per cent as opposed to 15 per cent nation-wide). This in turn is basically due to Japanese investment which accounts for more than 80 per cent of Masan investment (but for on *y* slightly more than 50 per cent nation-wide) and which is very much concentrated in this specific branch. (For further details see Annex Table A-3).

Tables 7 and 8 present a wide range of statistics from 1970 to May 1986 on EPZ-related and nation-wide cumulative investment in order to obtain a general picture of the importance of the EPZs in the Korean economy. For both Masan and Iri statistics are presented for domestic and foreign investment with the aim to ascertain the growth in the relative importance of domestic investment in both zones.

In the case of Masan during the initial years of its existence domestic investment formed 6 or 7 per cent of the total (Table 7). From 1977 onwards, it began to increase in relative terms and reached a peak of 28.7 per cent of total investment in the Zone in 1982. Subsequently, it fell steadily to 22.0 per cent in May 1986 - a figure somewhere between the 1980/1981 proportions. Since 1981 about one quarter of the cumulative value of total investment in Masan has been owned by Korean nationals.

In the case of Iri the reliance upon domestic capital from very early years is even more pronounced. As early as 1975, one year after the establishment of the zone, 28 per cent of total cumulative investment was coming from Korean nationals. After three succeeding years of reduced domestic proportions an upsurge began in 1979/80 which continued until at least May 1986 when 57.5 per cent of cumulative investment was sourced domestically. Clearly the permission granted in 1980 for Korean nationals to fully own an EPZ enterprise had an effect; but whether permission was granted because of a shortage of new foreign entrants or because of pressure from domestic manufacturers who wished to avail themselves of EPZ facilities must, in the absence of further information, remain moot.

Considering the two zones together, domestic investment reached 30 per cent of the total investment in the zones in 1983 and fell to 26 per cent in May 1985.

Table 8 (penultimate column) shows the importance of investment in Masan and Iri together in relation to total foreign direct investment in the Republic of Korea. Looking first at Masan separately: in 1970 foreign investment in Masan constituted 8.6 per cent of total foreign direct investment in the Republic of Korea (calculated from Tables 7 and 8). It reached a 1970-85 peak of 27.3 per cent in 1973. Thereafter its relative importance steadily declined, to 8.9 per cent in 1980 and 3.7 per cent in 1985. The addition of Iri adds about half a percentage point to the Masan proportions. For instance, in 1974 Masan's cumulative foreign investment alone constituted 22.6 per cent of cumulative foreign direct investment in the country; the addition of Iri makes the proportion 23.2 per cent. In 1980 the combined proportion was 9.4 per cent; in 1985, 4.0 per cent. What this series reflects is the increasing attractiveness of the Republic of Korea in general to foreign capital; hence, it was only to be expected that the EPZs would decline in relative importance.

Table 7. Masan and Iri EPZs: Cumulative<sup>a/</sup> foreign and domestic investment, 1970-86

	Masan EPZ				Iri EPZ				Masan and Iri EPZs			
	Investment				Investment				Investment			
	Domestic	Foreign \$million	Total	Domestic as proportion of total per cent	Domestic	Foreign \$million	Total	Domestic as proportion of total per cent	Domestic	Foreign \$million	Total	Domestic as proportion of total per cent
1970	0.2	1.2	1.4	13.9	-	-	-	-	0.2	1.2	1.4	13.9
1971	0.4	4.9	5.3	7.3	-	-	-	-	0.4	4.9	5.3	7.3
1972	2.0	34.9	36.9	5.4	-	-	-	-	2.0	34.9	36.9	5.4
1973	4.0	78.8	82.8	4.9	-	-	-	-	4.0	78.8	82.8	4.9
1974	6.7	82.2	88.9	7.6	0.07	2.1	2.2	3.2	6.8	84.3	91.1	7.5
1975	6.2	82.8	89.0	6.9	1.9	4.9	6.8	27.8	8.1	87.7	95.8	8.5
1976	6.6	91.4	98.0	6.8	1.8	5.8	7.7	23.7	8.4	97.2	105.6	8.0
1977	10.5	93.5	103.9	10.1	2.8	11.4	14.2	20.0	13.3	104.9	118.2	11.3
1978	14.6	97.4	111.9	13.0	2.4	7.2	9.6	25.2	17.0	104.6	121.6	5.8
1979	13.0	101.6	115.0	11.3	2.4	6.1	8.5	28.0	15.4	107.7	123.1	12.5
1980	19.7	93.1	112.9	17.5	2.2	5.7	7.9	27.9	21.9	98.8	120.7	18.1
1981	31.1	86.1	117.2	26.5	4.4	7.6	12.0	36.6	35.5	93.7	129.2	27.5
1982	33.3	82.9	116.2	28.7	3.3	8.4	11.8	28.2	36.6	91.3	127.9	13.1
1983	33.4	84.8	118.2	28.2	7.1	8.6	15.7	45.0	40.5	93.4	133.9	30.2
1984	30.5	97.7	128.2	23.8	7.6	9.2	16.8	45.2	38.1	106.9	145.0	26.3
1985	29.5	96.4	125.9	23.4	6.8	7.4	14.3	47.9	36.3	103.8	140.1	25.9
1986 <sup>a/</sup>	29.1	103.3	132.4	22.0	10.0	7.4	17.5	57.5	39.1	110.7	149.8	26.1

Sources and Notes: See Table 8.

a/ Statistics in this table are cumulative from 1970.

b/ As of 31 May 1986.

Table 8. Relationship between cumulative investment in Masan and Iri EPZs and investment in the Republic of Korea, 1970-85<sup>a/</sup>

Total investment in the Republic of Korea		Foreign investment in Masan and Iri EPZs as proportion of total foreign investment in the Republic of Korea	Domestic and foreign investment in Masan and Iri EPZs as proportion of total domestic capital formation in the Republic of Korea	
Foreign direct investment <sup>b/</sup>	Domestic & foreign direct investment <sup>b/</sup> plus other net capital inflows (= Total domestic capital formation)			
\$ million		P e r c e n t		
1970	14	2,065	8.6	0.07
1971	39	4,011	12.6	0.13
1972	133	6,094	26.2	0.61
1973	285	9,258	27.3	0.89
1974	363	13,181	23.2	0.69
1975	532	18,498	16.5	0.52
1976	605	25,406	16.1	0.42
1977	671	35,385	15.6	0.33
1978	799	50,806	13.1	0.24
1979	906	71,962	11.9	0.17
1980	1,047	89,956	9.4	0.13
1981	1,192	108,811	7.9	0.12
1982	1,380	129,745	6.6	0.10
1983	1,648	153,133	5.7	0.09
1984	2,067	178,266	5.2	0.08
1985	2,599	203,082	4.0	0.07

**Sources:** Masan and Iri investment from the Administration Offices of the EPZs. Total Republic of Korea Domestic Capital Formation from Bank of Korea, Economic Statistics Yearbook, 1985 and Monthly Statistical Bulletin (the current won figures were converted to \$ on the basis of the appropriate-year exchange rates from IMF International Financial Statistics, before cumulating). Total Republic of Korea investment from foreign sources from Ministry of Finance, Investment Guide to Korea, 1986, Appendix 2, p. 97.

a/ Statistics in this table are cumulative from 1970.

b/ Foreign direct investment should represent a net concept i.e. net of repatriation of foreign capital and exports of capital by Republic of Korea nationals. However, the figure which is used is titled "Foreign Investment by Year" by the Ministry of Finance and appears to be essentially a gross concept. Thus the importance of Masan and Iri are understated in the Table. But irrespective of the definition of direct investment, the domestic capital formation column is correct (since the "other net capital inflows" effectively takes care of the problem) and therefore the last column in the Table is also correct.

The final column of Table 8 serves merely to underscore the last comment: taking the domestic and foreign capital together which has been invested in the two zones combined we find that as a proportion of total domestic capital formation this rose to a peak of 0.89 per cent in 1973 and fell consistently to a marginal 0.07 per cent in 1985.

Dealing in cumulative investment statistics, as is done in Table 8, does, however, obscure some of the interesting annual movements which took place. Annex Table A-4 is designed to overcome this problem. It shows the net movements of investment into Masan and Iri, separately and jointly, from 1971 to May 1986. This Table shows that there were a number of years with a net capital outflow of the zones (1980 to 1982 and 1985 for Masan; 1978 to 1980 and 1985 for Iri).<sup>1/</sup> In 1972, a year after it began operations, Masan attracted about one third of the total foreign direct investment coming into the country. By 1975 Masan was "full"<sup>2/</sup> and new investment was negligible. But Iri was now on the scene, attracting foreign investment of nearly \$3 million. However, through the dramatic increase of direct investment into the Republic of Korea in that year even Iri's addition to Masan failed to raise the aggregate zones' proportion to more than 2 per cent. From 1976 to 1979 it appears that a deepening of capital was taking place in Masan, probably primarily due to reinvestment of part of the profits. In 1976 both zones' foreign investment reached a new high of 14.6 per cent of total direct foreign investment in the Republic of Korea. The years 1977/78 seem to mark a turning-point: aggregate zone investment faltered and became negative or negligible - a situation which continued up to 1985. In 1986, up to May, there was a resurgence of interest in Masan (\$7 million of new investment) but Iri attracted no new capital following a loss of \$1.8 million in 1985.

### 3. Exports, net foreign exchange earnings and value added

In 1985, total exports of Masan and Iri amounted to \$890 million, the lion's share of which (\$809 million) was contributed by Masan alone. To put this figure into perspective: In 1985 Masan and Iri exports taken together

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1/ A limitation of the table should be noted, however; the foreign direct investment in the Republic of Korea is gross rather than net. Hence the proportions in the last column understate the relative importance of Masan and Iri.

2/ The concept of "filling-up" an EPZ is often discussed in grossly inadequate terms. What is often referred to is some physical rate of occupancy given the order in which firms happen to have become established. The definition, consequently, avoids the notion of the economic effectiveness of 'occupancy' i.e. the appropriate labour, capital or skill intensity given Korea's factor prices. The correct interpretation of "occupancy rates" is fundamental to a clear understanding of what the EPZs could presently be producing and where their optimum product-mix in the future lies. Unfortunately, however, no further attention could be given to this issue in the study; it remains a matter for additional research.

constituted 3.1 per cent of Korea's total manufactured exports; the peak level of their combined share in the total was 4.3 per cent in 1979.<sup>1/</sup>

As to exports by branches (Table 9 and 10) a strong correspondence to the investment patterns observed above is obvious: Masan exports are clearly dominated by electronics and electrical (64 per cent in 1985) whereas textiles exports stand out in the case of Iri (again 64 per cent in 1985). Iri's export structure has become slightly more diversified in recent years with textiles losing 10 percentage points between 1981 and 1985 while both metals and electrical items have tripled their relative importance over those four years with annual growth rates of 47 and 44 per cent, respectively. On the other hand, within Masan the dominance of electronic/electrical items has markedly increased during 1975-85. However, the item showing the greatest increase in relative importance was precision machinery (from 4 to 14 per cent between 1975-85) as a result of a 33 per cent annual growth in current value terms.

Table 9. Masan EPZ: Exports by industrial branch, 1975, 1980, 1985  
(percentage shares)

Industrial branch	1975	1980	1985	Average annual growth rate 1975-85
Electronics and electrical	53.4	62.9	64.4	18.8
Ferrous metal	16.7	8.1	7.9	8.2
Non-ferrous metal	-	0.4	0.4	-
Machinery	4.3	1.2	2.7	11.3
Precision machinery	4.0	12.7	14.3	33.0
Textiles and garments	4.8	1.9	2.8	10.3
Footwear	4.6	6.1	4.5	16.4
Other	12.1	6.7	3.0	1.5
<b>TOTAL</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>16.6</b>
Total as percent of ROK manufactured exports	3.6	3.9	2.8	-

Source: Masan EPZ: Ministry of Trade and Industry.  
Republic of Korea: EPB, Major Statistics of Korean Economy, 1986.

Export statistics by country of destination are available only for Masan (Annex Table A-5). They point to the overwhelming importance of the Japanese and US market which taken together have tended to absorb around 85 per cent of total Masan exports. In most years Japan took a considerably higher

<sup>1/</sup> All output sold abroad or to firms in the Republic of Korea is regarded as being exported. The inclusion of the latter category of sales in 'exports' results from the fact that Republic of Korea users must pay in foreign exchange for such parts and components. However, sales of intermediate products by EPZ firms to other EPZ firms are treated as domestic sales. For further elucidation see section III.3. of this report.

Table 10. Iri EPZ: Exports by industrial branch, 1981, 1983, 1985  
(percentage shares)

Industrial branch	1981	1983	1985	Average annual growth rate 1981-85
Textiles	73.8	65.8	63.6	6.8
Leather	19.0	22.5	21.9	14.8
Metals	0.6	1.4	1.9	47.1
Electrical	3.2	6.8	9.2	44.3
Stone processing	3.3	3.4	3.4	11.2
<b>TOTAL</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>10.8</b>

Source: Ministry of Trade and Industry.

proportion than the USA - a pattern contrary to the Republic of Korea as a whole where the US export market predominates.

Furthermore, in the Republic of Korea - unlike in the case of most other countries' EPZs - the Zones have not been export growth leaders: During the 1975-85 period Masan's exports grew at 17 per cent annually as against 24 per cent for the country's total manufactured exports.

Before turning to a closer look at net foreign exchange earnings, a few definitional remarks are in order in view of the often confused use of value added terminology and foreign exchange terminology in the relevant literature. (The reader is referred to Annex Table A-6 which seeks to systematically present all components involved). For the sake of clarity it is essential to differentiate between the two concepts:

- Net foreign exchange earnings are the sum of wages, rents, services and domestic raw materials (material inputs).<sup>1/</sup>
- Value added is the sum of factor costs, i.e. wages, rents and profits.
- Hence, albeit largely overlapping (wages and rents are part of both net foreign exchange earnings and value added) the two concepts are not identical. For instance, value added in production increases along with higher profits without, at the same time, increasing net foreign exchange earnings. In turn, a higher utilization of domestic raw materials results in higher net foreign exchange earnings without having any effect on factor costs and hence value added.<sup>2/</sup>

These definitions permit a quantitative analysis of the EPZ's net foreign exchange earnings, domestic raw materials ratio and value added ratio and thus

<sup>1/</sup> Theoretically, non-repatriated profits would have to be included as well whereas salaries of expatriate staff accruing abroad would have to be excluded. Due to lack of information, these aspects have been neglected in the present study.

<sup>2/</sup> Needless to say that this applies only in a ceteris paribus sense.

a first crude measure of the magnitude of their interactions with the domestic economy.

In the case of Masan (Table 11) in particular two significant observations can be made. Firstly, the share of net foreign exchange earnings in total exports went up sharply within only 5 years reaching 49 per cent in 1976. This share is conspicuously high when seen in terms of international EPZ experience. However, since then the development has more or less stagnated. After a peak in 1982 (which brought the figure up to 54 per cent) it went down again to approximately its 1977 level. The same holds true for the value added/gross output ratio which, after having reached higher values in the initial years of Masan's operation,<sup>1/</sup> stood at 14 per cent in 1977 and, following minor fluctuations, again in 1985. The overall impression thus emerges that Masan went through a highly dynamic early phase in terms of creating domestic linkages but since 1977, there has been hardly any perceptible increase in the relevant indicators.

Table 11. Masan EPZ: Net foreign exchange earnings and value added ratio, 1971-1985

	Net foreign exchange earnings		Value added as proportion of gross output
	\$ mill.	As percent of exports	percent
1971	0.2	22.2	22.2
1972	3.0	30.9	20.6
1973	25.9	36.8	23.0
1974	70.1	38.6	18.1
1975	72.0	41.2	17.6
1976	149.1	49.2	11.9
1977	180.9	49.2	13.9
1978	251.2	51.8	9.0
1979	311.0	51.8	12.3
1980	333.0	53.0	10.2
1981	371.6	53.4	10.8
1982	324.5	54.0	14.0
1983	373.7	52.9	12.1
1984	444.0	50.5	9.6
1985	412.6	51.0	13.7

Source: Annex Table A-6.

<sup>1/</sup> This implies that non-factor inputs have subsequently been growing more rapidly than exports.



The evidence in the case of Iri (Table 12) is distinctly different. Net foreign exchange earnings were relatively high in the beginning (48 per cent in 1977; 55 per cent in 1978) but have shown a downward tendency since which brought them to only 39 per cent in 1985. Again quite contrary to the Masan experience, the value added ratio has consistently gone up to reach 21 per cent in 1985.<sup>1/</sup>

Table 12. Iri EPZ: Net foreign exchange earnings and value added ratio, 1977-1985

	Net foreign exchange earnings		Value added as proportion of gross output
	\$ mill.	as percent of exports	percent
1977	8.9	47.8	7.0
1978	18.5	54.9	8.5
1979	18.2	42.8	8.9
1980	19.4	42.1	14.5
1981	21.8	40.8	17.4
1982	22.4	39.2	18.4
1983	23.3	37.6	19.5
1984	30.2	40.4	21.8
1985	31.2	38.8	21.1

Source: Calculated from data provided by Iri EPZ Administration Office and MTI.

#### 4. Productivity and profitability

This section presents a brief comparative analysis of productivity and profitability of manufacturing activities within Masan and in the Republic of Korea as a whole. As to productivity the value added per employee has been calculated in both cases for the year 1982, the latest one for which a nation-wide Manufacturing Survey was available (Table 13).

Whilst Masan provides employment for just over 1 per cent of the country's total employees in manufacturing they produce only 0.4 per cent of total manufacturing value added implying that value added per employee in Masan was only less than one third (29 per cent) of the Korean average. In the absence of evidence regarding lower skills etc. of the Masan labour force this disparity appears to be due to an industry-mix at Masan which is much

<sup>1/</sup> During the period 1977-85 it averaged 15.2 per cent whilst in Masan over the same period the average ratio was 11.7 per cent.

Table 13. Relationship between value added per employee in Masan EPZ and in the Republic of Korea, 1982

	Masan EPZ	Republic of Korea	Masan EPZ as proportion of Republic of Korea (per cent)
	1982	1982	1982
Employment (Number)	26,012	2,098,787	1.2
Value added (\$ million)	84.1	23,111	0.4
Value added/employee (\$)	3,233	11,012	29.4

Sources: Masan EPZ: Administration Office.  
 Republic of Korea: 1982 Manufacturing Survey in Bank of Korea, Economics Statistics Yearbook 1986, Table 85, p.153.

more oriented towards low value-added industries than Korean industry as a whole.<sup>1/</sup>

Annex Table A-8 provides figures on profitability<sup>2/</sup> the objective being to compare the profitability of capital<sup>3/</sup> in Masan with the overall profitability of foreign capital in the Republic of Korea. Obviously, Masan's profit rate has shown large fluctuations ranging from -6.7 per cent in 1978 to 23.2 per cent in 1985. In the years immediately following the poor 1978 performance profit rates turned positive again but remained at a fairly low level. An explanation is provided by the following statement of the Director-General, Industrial Policy Bureau of the Ministry of Trade and Industry: "The late 1970s have witnessed the economic condition to the EPZ enterprises not only worsen due to expiration of grace periods but also because of the Second Oil Shock. As a result, many foreign EPZ firms found themselves so deep in debt that they had difficulties even to move out. To cope with the situation, the Korean Government initiated the legalization of the full Korean ownership of EPZ enterprises to facilitate efficient localization."<sup>4/</sup>

1/ It would have been preferable, of course, to have made direct comparisons between the Zones and the Republic of Korea so far as industry-mix is concerned but comparable statistical breakdowns of the sectors were not available. It was also not possible to take account of potentially different capacity utilization rates since no such data for the Zones is available.

2/ "Profitability" in Annex Table A-8 relates to capital investment. Note that in Annex Table A-6 "profitability" was related to exports.

3/ Of course, to be consistent this should measure foreign capital only; however it proved necessary to use statistics on total investment in Masan, i.e. foreign plus domestic.

4/ Kim, Jong-Nam 1983. p.24.

On the whole it appears, however, that profitability, apart from a few poor years, has shown a moderately upward trend. This applies in particular to the eighties which have witnessed very high two-digit profit rates (with the notable exception of 1984).

Finally, a comparison is made between profitability at Masan and nation-wide. Excluding 1972, when Masan was just newly-established, the Zone has experienced five years in which its profit rates surpassed the national average and seven years with below-average profit performance. Rough inspection of the data does not reveal any regular pattern of interrelationships.

#### 5. Employment and wages

Total employment in Masan and Iri reached a peak level of 37,900 in 1984 after which it declined to 32,800 in 1985 (Table 14).<sup>1/</sup>

Table 14. Number of employees: Masan and Iri EPZs and Republic of Korea manufacturing, 1971-1985, selected years

	Masan EPZ	Iri EPZ	Masan EPZ plus Iri EPZ	Republic of Korea manufactur- ing	Masan plus Iri EPZs as propor- tion of Republic of Korea manu- facturing (percent)
	Total	Total	Total		
	'000	'000	'000	'000	
1971	1.2	n.a.	1.2	1,336	0.09
1975	22.6	0.3	22.9	2,205	1.04
1977	30.7	2.3	33.0	2,798	1.18 <sup>±</sup>
1984	33.9 <sup>±</sup>	4.0	37.9 <sup>±</sup>	3,350	1.13
1985	29.0	3.8	32.8	3,500	0.94

Source: Annex Table A-9.

a/ Maximum Masan EPZ employment.

b/ Maximum total EPZ employment.

c/ Maximum total EPZ employment as proportion of Republic of Korea employment in manufacturing.

As a proportion of total manufacturing employment in the Republic of Korea the Zones' contribution has never exceeded 1.2 per cent (reached in 1973 and 1977) and has recently been declining to below 1 per cent in 1985. A more significant comparison, however, would be between the Zones' employment and that in foreign firms nation-wide. Due to a lack of more recent data on

1/ It increased again to 36,000 as of 30 June 1986 (see Annex Table A-9).

overall foreign investment-related employment this comparison could only be undertaken for the years 1974-78 (Table 15). Including joint ventures as foreign firms in Masan and Iri it emerges that they employed a substantial share (13.1 per cent in 1974) of workers in foreign firms in the country's manufacturing industry. The share decreased slightly to 10.8 per cent by 1978.

As to the sex distribution of employment (Annex Table A-10) Masan's employment is rather more heavily weighted in favour of female employment (about 78 per cent of the total in recent years) than is Iri's (about 75 per cent). However, there has been a considerable decline in the proportion of women employed in Masan since its inception. In 1971 the proportion was 90 per cent; in 1985 it was 77 per cent. This may be interpreted as a corollary to growing capital and skill-intensity in the Zone, on the basis of a given preference for employing males in more skilled activities.

Comparing the sex distribution in the Zones with that in the whole country confirms the standard pattern of female dominance to be observed in EPZs all around the world. Even allowing for the slight increase in the proportion of the work-force occupied by women in the Republic of Korea (from 37 per cent in 1975 to 39 per cent in 1985) that proportion is only half what it is in Masan and Iri. It seems that the majority of young women (18-24 years) employed in the Zones are engaged in relatively unskilled low-value-added occupations.

The wages picture is looked at in Annex Table A-11 and again the basic thrust is to compare the EPZs with the Republic of Korea as a whole. The easiest macro-economic approach to adopt is to calculate the average wage per person employed in the Zones and to compare it with the similar statistic for the Republic of Korea. This has been done only for Masan. Masan's average wage per person employed rose from \$869 per annum in 1974 to \$2,746 per annum in 1985. During the same period, Korean average wages in manufacturing increased from \$749 per annum (14 per cent lower than Masan's) to \$3,635 per annum (32 per cent higher than Masan's). However, 1974 seems to have been an exceptionally favourable year for Masan employees; from 1975 to 1985 the Masan/Korea ratio ranged from 97 to 64 per cent - with an overall downward tendency for the whole period. However, in the most recent years the statistics show a rise in the Masan/Korea ratio which may be indicative of a changing industry mix towards more sophisticated lines of production in Masan.

Table 15. Importance of Masan and Iri employment in total Korean employment, 1974-78  
(in '000 and percent)

	Unit	1974	1975	1976	1977	1978
1. Employment in Masan EPZ	'000	20.822	22.586	29.953	30.719	30.960
2. Employment in foreign-owned firms or joint ventures in Masan EPZ <sup>a/</sup>	'000	19.781	21.457	28.455	29.183	29.412
3. Employment in Iri EPZ	'000	-	0.333	1.238	2.339	2.964
4. Employment in foreign-owned firms or joint ventures in Iri EPZ <sup>a/</sup>	'000	-	0.167	0.619	1.170	1.482
5. Employment in Masan and Iri EPZs in foreign-owned or JV firms (2+4)	'000	19.781	21.624	29.074	30.353	30.894
6. Total employment by foreign firms in Republic of Korea	'000	159	180	225	257	315
7. Masan + Iri EPZ foreign firm and JV employment as proportion of foreign firms' employment in ROK (5/6)	%	12.6	12.2	12.9	11.7	9.8
8. Total employment by foreign firms in Republic of Korea manufacturing industry	'000	153	174	218	245	288
9. Masan + Iri EPZ foreign firms and JV employment as proportion of foreign firms' employment in ROK manufacturing industry (5/8)	%	13.1	12.6	13.3	12.2	10.8
10. Total Republic of Korea employment	'000	11,586	11,830	12,556	12,929	13,490
11. Republic of Korea manufacturing employment	'000	2,012	2,205	2,678	2,798	3,016
12. Weight of foreign firms:						
12.1 Republic of Korea						
12.1.1 In total employment (6/10)	%	1.4	1.5	1.8	2.0	2.3
12.1.2 In manufacturing employment (6/11)	%	7.6	7.9	8.1	8.8	9.5
12.2 Masan + Iri EPZs						
12.2.1 In total employment (5/10)	%	0.17	0.18	0.23	0.23	0.23
12.2.2 In manufacturing employment (5/11)	%	0.98	0.98	1.09	1.20	1.02

Sources: Masan and Iri EPZ administration offices.

Republic of Korea: Bohn Young Koo, "Direct Foreign Investment in Korea" in Galenson, W. (Ed.), Foreign Trade and Investment ... Table 4.12 and EPB Major Statistics of Korean Economy 1986, Table 2-8a, p.24.

a/ Assuming that 95 per cent of total were so employed, which is the approximate investment ownership proportion.

b/ Assuming that 50 per cent of total were so employed, which is the approximate investment ownership proportion.

### III. CREATION OF LINKAGES WITH THE DOMESTIC ECONOMY

Following the preceding broad overview of the performance of Korea's EPZs, this chapter focusses on the empirical evidence available concerning the scope and the nature of linkages that have been established between enterprises located within EPZs and the Korean domestic economy. The two main types of backward linkages, viz. utilization of domestic raw material inputs and subcontracting arrangements with domestic firms, are investigated in more detail. This is followed by a brief section on sales in the domestic market by EPZ firms (which may be considered a forward linkage). Finally, the question of whether linkages have been policy-induced or market-induced is being looked into.

#### 1. Utilization of domestic raw materials<sup>1/</sup>

The enclave character of EPZs is an established topic in the relevant literature. In fact, it has been demonstrated time and again that EPZs tend to remain isolated from their respective hinterland due to a distinct preference of EPZ-based companies for sourcing their raw materials from abroad, often by means of intra-firm transactions. As will be shown below, the Korean EPZs provide an exception to this traditional pattern, at least as regards the degree of backward linkages that have been created.

Firms both in Masan and Iri EPZ have substantially expanded their domestic sourcing links within a relatively short period after the zones' establishment (Table 16).

In the case of Masan EPZ, the share of domestically supplied raw materials in total raw materials used surged from 3.3 per cent to roughly one quarter (24.4 per cent) within just four years. In the second half of the seventies it further increased to reach more than one third by 1979. Since then, the share has remained at this level with minor fluctuations (peak level of 35.8 per cent reached in 1982).

A similar development must have taken place in the case of Iri EPZ although corresponding data for the first years of operation are not available. Again, it took only four years until the share of domestic in total raw materials reached the significant level of 28.6 per cent. As in the case of Masan EPZ, a certain saturation point appears to have been reached after a bit less than a decade of operation. With 34.0 per cent the 1985 share was slightly higher in Iri. Within a narrow range of deviation, however, both zones have shown a very similar performance in this regard.

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1/ Note: The term 'domestic raw materials' is used here in accordance with data provided and definitions applied by the EPZ Administration Offices. This implies two important qualifications:

- (a) Raw materials are meant to encompass also parts and components.
- (b) 'Domestic' in fact means 'non-imported', i.e. raw materials supplied by other EPZ firms have been considered as being domestically supplied. It is this broad concept of domestic sourcing that the figures presented in this section refer to. In section III.3. domestic sourcing proper and intra-EPZ sourcing will be looked at separately.

Table 16. Masan and Iri EPZ: Indicators of utilization of domestic raw materials, 1971, 1975, 1979-85

Year	Share of domestic raw materials in export value		Share of domestic raw materials in total raw materials	
	Masan	Iri	Masan	Iri
1971	2.2	..	3.3	..
1975	17.3	..	24.4	..
1979	24.0	22.8	33.8	28.6
1980	22.8	..	33.0	..
1981	21.7	21.5	32.7	28.2
1982	23.7	18.5	35.8	24.5
1983	22.0	31.3	32.9	34.8
1984	22.3	29.9	31.4	35.5
1985	22.0	28.4	32.3	34.0

Source: Calculated from data provided by Masan and Iri EPZ Administration Offices.

As is to be expected, various industrial branches display distinct differences in their input sourcing behaviour. A branch breakdown of data on the share of domestic in total raw materials is only available for Masan EPZ (Table 17). It shows that the manufacture of footwear and of ferrous metal products rely to the largest extent on domestic supplies of raw materials; their domestic raw materials ratio stood at 69 per cent and 77 per cent, respectively, in 1985. At the other end of the spectrum, it was the non-ferrous metals branch (8 per cent) and the manufacture of precision machinery (16 per cent) which had the lowest ratios in this regard. Textiles and garments showed a ratio of 37 per cent - which put it above the average for all Masan EPZ companies - following, however, a significantly lower value in 1984 (19 per cent).

Table 17. Masan EPZ: Share of domestic in total raw materials, by industrial branch, 1980, 1983-85

Branch	Share of domestic in total raw materials (percentage)			
	1980	1983	1984	1985
Electronic and electrical	33.0	29.0	29.0	29.0
Ferrous metals )		65.0	61.0	69.0
Non-ferrous metals )	40.0	19.0	18.0	8.0
Machinery	..	43.0	35.0	34.0
Precision machinery	9.0	11.0	16.0	16.0
Textiles and garments	33.0	31.0	19.0	37.0
Footwear	70.0	75.0	81.0	77.0
Other	29.0	31.0	42.0	41.0
TOTAL	33.0	32.9	31.4	32.3

Sources: 1980: Warr 1984, p.175.

1983-85: Calculated from data provided by Masan EPZ Administration Office.

Looking at trends of domestic sourcing over time, two developments stand out. Whereas both in electronic and electrical goods and in general machinery, the domestic raw materials ratios went down, the opposite is true for precision machinery. The reasons for these tendencies could not be ascertained. They may be indicative, however, of (a) increasing competition from external suppliers of cheap standard electric/electronic components and (b) an emerging capability of Korean suppliers to produce the more sophisticated components required in precision machinery manufacture.

Table 18 builds upon data presented by Bohn Young Koo (1985, p.195) on the domestic sourcing behaviour of foreign companies in the Republic of Korea in general and compares the backward linkages found for Masan with those for the country as a whole. As the country level data are available only for the 1974-78 period the comparative exercise unfortunately has to be limited to these years.

Table 18. Comparison of domestic raw materials utilization: Masan EPZ versus overall ROK foreign companies, 1974-78

	1974	1975	1976	1977	1978
<u>Percentage share of domestic raw materials in production value</u>					
(1) For Masan EPZ	15.2	17.3	21.0	24.2	22.4
(2) For ROK foreign firms	14.9	13.3	15.6	15.3	20.7
(1)/(2) x 100	102	130	135	158	108
<u>Percentage share of domestic raw materials in total raw materials</u>					
(3) For Masan EPZ	22.0	24.4	30.0	33.4	31.1
(4) For ROK foreign firms	18.1	17.3	21.2	22.3	30.0
(3)/(4) x 100	122	141	142	150	104

Sources: Calculated from data provided by Masan EPZ Administration Office and from Bohn Young Koo, 1985, p.195.

Looking first at the most direct linkage effect, viz. the share of domestic raw materials in total production value, it can be seen that this share increased relatively steadily both for Masan EPZ firms and for foreign firms country-wide, from around 15 per cent to more than 20 per cent. The intriguing point, however, is that the Masan linkage ratios were consistently higher than those for the national average, in 1977 by as much as 58 per cent. Exactly the same pattern can be observed for the second linkage indicator used, i.e. for the share of domestic in total raw materials.

At first glance, this appears to be a surprising finding in view of the general enclave nature of EPZs. Several explanations may be offered.

First, and most obvious, the branch structure of investment within Masan EPZ is distinctly different from the overall branch structure of foreign investment in the country: electronics accounts for almost 60 per cent of investment within Masan EPZ but for less than 20 per cent of nation-wide foreign investment in manufacturing. At the same time, foreign investment in



chemical branches is the most important area at the national level yet it has remained insignificant in Masan EPZ. Given that different industries vary in their propensity to establish links to domestic suppliers, this structural factor may be able to explain the evidence to some degree.

Second, the industrial agglomeration in Masan EPZ may have been of influence. It appears reasonable to assume that the high industrial concentration in general, and the specific branch focus in particular, attract small- and medium-scale suppliers by offering them a big enough market to specialize in parts/components production.

Third, it may also be the case that either individual firms in Masan EPZ or the EPZ Administration Office have actively promoted the establishment and/or stimulation of domestic industries designed specifically to supply inputs to EPZ firms. However, no specific information is available on this point.

Whatever the exact explanation, the figures taken at face value show that in the Republic of Korea EPZ companies not only maintain substantial linkages with domestic suppliers of inputs but in this regard even 'outcompete' foreign companies as a whole.<sup>1/</sup>

## 2. Subcontracting arrangements

Soon after the establishment of Masan EPZ in 1971 it became obvious that EPZ firms were not only interested in the domestic sourcing of material inputs but increasingly also in the partial subcontracting of production to domestic firms. While the exact origin of the subcontracting system in Masan appears to be unknown, the practice obviously grew from the earliest years of the EPZ. This may partly be explained by the extremely favourable conditions for Korean exports which coincided with the EPZ's establishment. World trade was expanding rapidly in the years immediately preceding the first oil price increase of 1973. In this situation of booming markets the newly established Masan firms found it impossible to meet all export orders and the practice developed, with official approval, of arranging for some of the simpler work to be done outside the zone. As a reflection of this trend, the 1971 Free Export Zone Law under which Masan EPZ had been established was revised in 1973 to include detailed regulations on the preconditions and organization of the so-called 'outzone processing', viz. subcontracting arrangements. This was now to be allowed when

- the process of manufacturing made its use essential;
- the partial processing outside the EPZ did not exceed 30 per cent<sup>2/</sup> of the total manufacturing process, calculated in terms of production costs;

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1/ This result is not necessarily invalidated by the information provided in Section III.3. on the significance of intra-EPZ transactions which are statistically included among domestic supplies.

Foreign firms outside the EPZs may also be expected to rely heavily on inputs from other foreign companies. The exact degree to which this is the case is unknown, however.

2/ Recently this has been increased to 60 per cent.

- the goods processed or produced by the outzone activity were components or intermediate products for production processes finalized in the EPZ.

Subcontracting historically has formed and still forms to a large extent an essential part of the Japanese industrial structure; it seems clear that the advantages which have led to its use in Japan are also perceived to exist in EPZ out-processing arrangements. For instance, the firm inside the zone can operate with a standard-sized labour force and can utilize outzone processing to meet sudden increases of orders. In addition, the firm within the zone can concentrate its capital, space and expertise on the more complex aspects of production and make optimum use of its resources by subcontracting the more standard, simpler processes.

As far as the "entrusted" firms<sup>1/</sup> outside the zone are concerned, they may operate entirely to satisfy demands of the "trusted" firm within the zone, in which case they are effectively subsidiaries. Or the relationship may be even closer with the "entrusted" firms being a branch of the "trusted" firm. A third possibility is that no permanent structural relationship exists but that the "entrusted" firm stands ready to execute orders from time to time for the "trusted" firm and makes its own arrangements for increasing or decreasing its labour force, transportation, purchase of supplies etc.

What, then, has been the order of magnitude of outzone processing? Does it represent a significant linkage factor? The situation in Masan EPZ is well documented and is analyzed in more detail below (Table 19).<sup>2/</sup>

A remarkable increase in the number of entrusted firms has taken place from 1978 to 1985. In 1978 there were 99 firms outside Masan EPZ allowed to perform subcontracting work for EPZ-based firms. By 1984 the number had more than doubled, to 252; in 1985 it dropped back to 193. However, the number of orders more than doubled between 1978 and 1985 and the value of orders tripled in current prices. Properly deflated, the real growth in the value of orders reached 38 per cent - a rate of increase of 4.7 per cent per annum.

The final column of Table 19 shows the outzone processing ratio, defined as labour payments to entrusted firms as proportion of total labour payments by EPZ firms. This ratio has risen from 12.6 per cent in 1978 to 21.4 per cent in 1985 implying that in 1985 for every \$1 spent on wages in Masan \$0.27 was spent on wages by subcontracting firms outside Masan.

From Table 20 it emerges that the share of outzone processing employment in total Masan EPZ employment was 25.7 per cent in 1985. This was 4.3 percentage points higher than the wage-based outzone processing ratio indicating lower wages being paid to outzone workers. Moreover, Table 20 provides insights into the subcontracting 'intensity' of different industrial

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1/ In the terminology used by Masan EPZ a "trusted" firms is a firm within the EPZ which is given permission to arrange for some of its manufacturing processes to be undertaken outside the EPZ. An "entrusted" firm is the firm outside the EPZ permitted to produce on behalf of a trusted firm, including the processing of duty-free inputs.

2/ Data availability is less comprehensive in the case of Iri EPZ. However, the value of Iri's outcome processing orders in 1985 was only 7 per cent of the corresponding value in Masan.

Table 19. Masan EPZ: Outzone processing, 1978-95

Year	Number of entrusted firms	Orders to entrusted firms				Labour payments to entrusted firms \$'000	Outzone processing ratio <sup>b/</sup> (per cent)
		Number	Value in current prices \$'000	Price index <sup>a/</sup> (1978=100)	Value in constant prices \$'000		
1978	99	2,982	7,179	100.0	7,179	6,900	12.6
1979	99	3,239	9,682	134.9	8,008	9,700	12.9
1980	108	3,386	12,400	172.7	7,118	12,300	18.0
1981	114	3,754	13,623	189.8	6,578	13,700	18.9
1982	117	4,497	14,881	207.3	6,811	16,900	21.7
1983	207	5,173	18,575	258.7	8,552	17,500	20.5
1984	252	6,448	24,032	334.8	10,994	24,000	23.1
1985	193	6,608	21,599	300.9	9,894	21,700	21.4

Sources: Masan EPZ Administration Office and Bank of Korea, Economic Statistics Yearbook and Monthly Statistical Bulletin.

a/ Wholesale price index for manufactured products.

b/ Labour payments to entrusted firms as proportion of total labour payments by EPZ firms.

Table 20. Masan EPZ: Employment effects of outzone processing by industrial branch, 1985

Industrial branch	Employment in Masan EPZ (no. of persons)	Employment in entrusted firms (no. of persons)	Share of outzone processing employ- ment in Masan EPZ (per cent)
Electronics & electrical	17,926	4,821	26.9
Ferrous metals	960	148	15.4
Non-ferrous metals	198	14	7.1
Machinery	456	6	1.3
Precision machinery	3,982	1,012	25.4
Textiles & garments	775	472	60.9
Footwear	3,608	763	21.1
Other	1,078	225	20.9
<b>TOTAL</b>	<b>28,983</b>	<b>7,461</b>	<b>25.7</b>

Sources: Masan EPZ Administration Office and Lee, 1985, p.8.

branches. It is seen that the manufacture of electronic and electrical goods accounts for almost two thirds of all outzone employment (due to its predominance in the EPZ) whereas the production of textiles and garments exhibits by far the highest propensity to engage in subcontracting. On the whole, almost 7,500 persons were employed in outzone processing on Masan EPZ orders.

Two further characteristic features of outzone processing have been determined by recent research<sup>1/</sup> on the regional economic impact of Masan EPZ:

- The entrusted firms tend to be small-scale enterprises. In 1985, 62 per cent of all entrusted firms had less than 50 employees, another 30 per cent less than 200 employees.
- As to location, 34 per cent (1985) of entrusted firms were to be found in Masan City, 52 per cent in urban areas outside Masan City and 14 per cent in rural areas of the country. Further, it was found that 74 per cent of total employment induced by Masan EPZ orders was accounted for by non-Masan City areas.

Obviously, Masan EPZ firms have distributed their outprocessing orders widely over the Republic of Korea. Orders which they gave to areas outside Masan City generated employment of 2,400 in 1985. Thus one of the conclusions to emerge on the topic of outzone processing is the widespread nation-wide interrelationships having been established between Masan EPZ firms and their subcontracting partners. It is expected that subcontracting will continue to grow if investment increases in Masan EPZ. Demands are already being made for a simplification of the relevant administrative procedures. These demands may

<sup>1/</sup> Cf. Lee 1985.

be expected to meet with a positive response from the Government in whose view outzone processing "has accelerated the use of local raw materials and absorption of the urban and rural labour forces without any additional movement of the population".<sup>1/</sup>

### 3. Sales to the domestic market and intra-EPZ sales

As already mentioned in footnote 1 on page 30, domestic sales/purchases of EPZ firms, as defined in the available statistics, also include those transactions taking place between different EPZ firms.<sup>2/</sup> It will be shown below in detail that these intra-EPZ transactions have assumed significant orders of magnitude and have to be accounted for properly when discussing the linkage issue.

For the sake of clarity this section first reviews domestic sales proper (referred to below as 'sales to the ROK market') before then turning to transactions between EPZ firms (referred to below as 'intra-EPZ sales' or 'intra-EPZ purchases' as appropriate).

Sales of part of EPZ production to the ROK market may be considered as a forward linkage. Originally such sales were not envisaged; all EPZ output was to be for export. But over the years some relaxation of official policy has occurred and firms are now allowed to sell to the ROK market up to 30 per cent of previous year's exports. Frequently, however, it is only components which may be sold locally and not the finished products. Nevertheless, all industrial branches in Masan EPZ availed themselves of the possibility of selling in the domestic market in 1985 and 1986 (Table 21).

Table 21. Masan EPZ: Sales to the ROK market by industrial branch,  
1981, 1983, 1985-86  
(in thousand US \$)

Industrial branch	1981	1983	1985	1986 <sup>a/</sup>
Electronic and electrical	487	1,728	2,582	2,215
Ferrous metal	72	80	113	351
Non-ferrous metal	90	372	333	398
Machinery	1,136	1,222	791	671
Precision machinery	6	309	371	718
Footwear	-	-	15	17
Textiles and garments	-	9	63	2
Others	116	262	358	334
<b>Total</b>	<b>1,907</b>	<b>3,981</b>	<b>4,626</b>	<b>4,706</b>

Source: Masan EPZ Administration Office.

a/ To the end of July.

1/ Lee 1985, p.4.

2/ These may be located either in the same or in different EPZs in the Republic of Korea.

In practice sales to the ROK market represent but a marginal share of the total value of production of Masan EPZ: in 1981 they amounted to \$1.9 million or some 0.3 per cent of total production value, in 1985 the figure had risen to \$4.6 million (0.6 per cent). It may be observed, however, that the growth rate of sales to the ROK market was quite high in the 1981-85 period: it reached 25 per cent per annum in current value terms. As to the branch composition of these sales, it is clear from Table 21 that engineering and metal industries in general, and electronic & electrical industries in particular, account for the lion's share whereas textiles & garments and footwear rely almost exclusively on exports. This pattern indirectly confirms the predominance of components in sales to the ROK market.

A full account of the destination of sales from Masan EPZ firms is given in Table 22. From this it emerges that since 1977 some 14 per cent of total production was not directed to export markets; the non-export share peaked at 20 per cent in 1982. As data available for the years 1981, 1983 and 1985 further indicate, these sales went almost entirely as intermediate inputs to other EPZ firms where, for statistical purposes, they are regarded as being domestically supplied inputs. The implications of this will be discussed in the following section which provides a summary view of the linkages created by Korean EPZs.

Table 22. Masan EPZ: Production and destination of sales, 1971-85

Year	Total production \$'000	Exports \$'000	Non-exports			
			\$'000	per cent of production	of which to ROK market	of which to other EPZ firms
1971	857	857	-	-	-	-
1972	9,739	9,739	-	-	-	-
1973	70,374	70,374	-	-	-	-
1974	181,547	177,782	3,765	2.1	..	..
1975	174,803	169,415	5,388	3.1	..	..
1976	303,001	285,716	17,285	5.7	..	..
1977	367,918	347,076	20,842	5.7	..	..
1978	484,789	416,374	68,415	14.1	..	..
1979	600,558	512,957	87,602	14.6	..	..
1980	628,100	538,285	89,815	14.3	..	..
1981	696,341	592,793	103,548	14.9	1,907	101,641
1982	601,342	489,198	112,144	18.6	..	..
1983	706,537	563,778	142,759	20.2	3,981	138,778
1984	878,601	739,472	139,129	15.8	..	..
1985	809,319	698,007	111,312	13.8	4,626	106,686

Source: Masan EPZ Administration Office.

4. Structure of linkages: A summary view

To arrive at a summary view of the scope and structure of linkage creation, a closer look is taken below at the composition of the value of production in Masan EPZ. The year 1985 has been taken for this exercise as it is the latest year for which all data required have been available. However, this particular year may be taken as fairly representative of the structure of production in Masan EPZ in recent years.

Figure 1

**MASAN EPZ:  
COMPOSITION OF THE VALUE OF PRODUCTION, 1985**

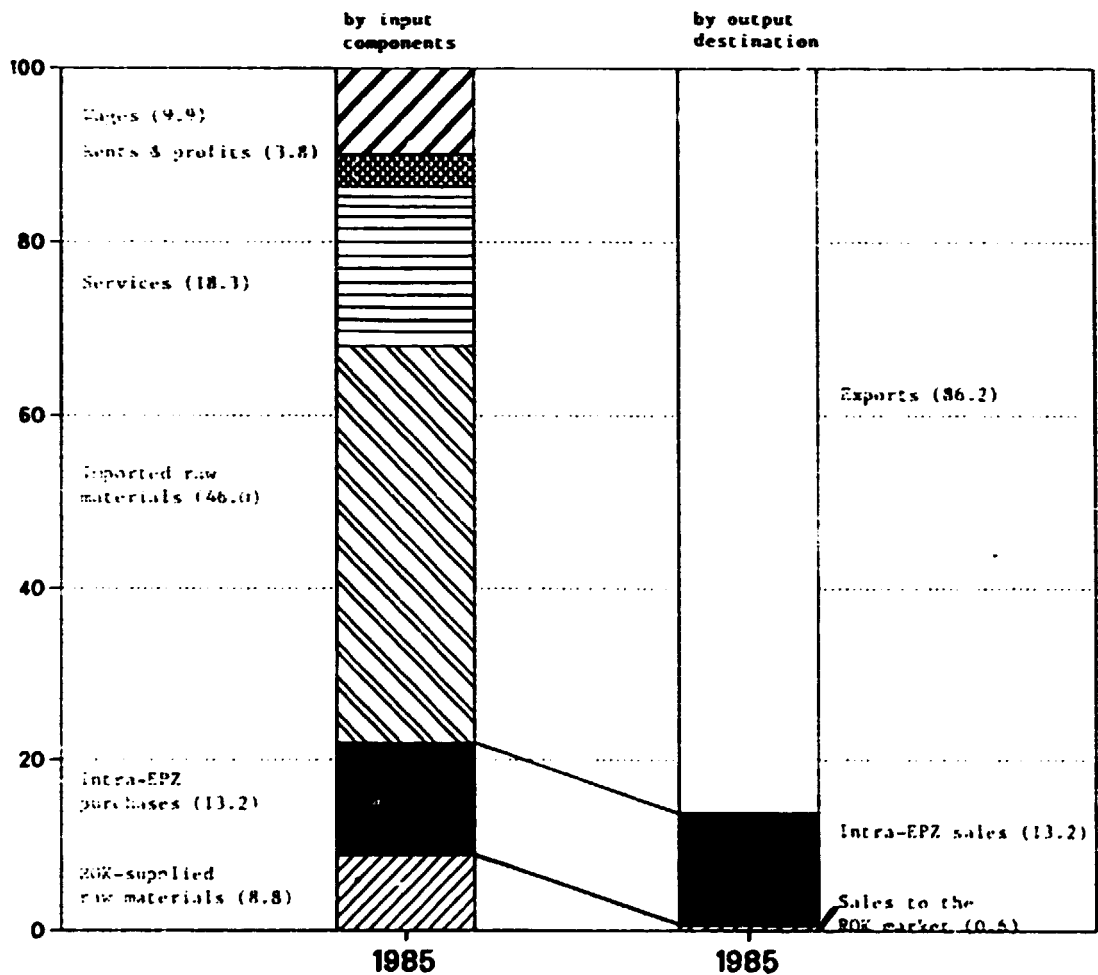


Figure 1 provides a breakdown of the 1985 value of production (\$810 million) in two different respects: it shows how the production was generated and to which markets it was directed. The following conclusions emerge:

The value added ratio, i.e. the share of value added in the total value of production, stood at 13.7 per cent indicating a relatively low degree of industrial processing. Wages alone accounted for 9.9 per cent of the production value, profits and rents for another 3.8 per cent.<sup>1/</sup>

The domestic raw materials ratio, i.e. the share of domestically supplied raw materials in the total value of production, reached 22.0 per cent when applying the broad definition which includes intra-EPZ purchases (13.2 per cent). Raw materials supplied from outside the EPZ alone accounted for 8.8 per cent of production value. It appears to be a moot point whether intra-EPZ purchases should actually be considered as domestic supplies or not. On the one hand, they tend to perpetuate the enclave nature of EPZs rather than fulfilling the expectation of linkages leading to economic spread effects. On the other hand, intra-EPZ purchases do generate additional domestic value added if the alternative were to import the same raw materials from abroad. In addition, raw materials supplied from outside the EPZ may also have a high import content which would tend to further blur the distinction between domestic supplies in a narrow and in a broad sense.

The local content ratio, i.e. the combined share of wages, rents, services and domestically supplied raw materials in production value,<sup>2/</sup> reached 50.4 per cent, largely as a result of the high importance of services which alone accounted for 18.3 per cent of the production value.

As to the destination of sales from Masan EPZ in 1985, figure 1 shows that 86.2 per cent were exported, 13.2 per cent were sold to other EPZ enterprises and 0.6 per cent reached the ROK market.

Figure 2 throws more light on the changing role of intra-EPZ purchases over time. It can be seen that in the 1975-85 period the share of imported in total raw materials remained fairly stable in the 65-70 per cent range and accordingly, domestically supplied raw materials accounted for 30-35 per cent of the total.

However, substantial and quite erratic changes took place with regard to the sources of domestic raw materials: up to 1977, the share of intra-EPZ purchases in total raw materials was below 10 per cent; in 1978 it more than doubled to 19.5 per cent within just one year. With the exception of 1982

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1/ The share of rents alone reached a negligible 0.2 per cent.

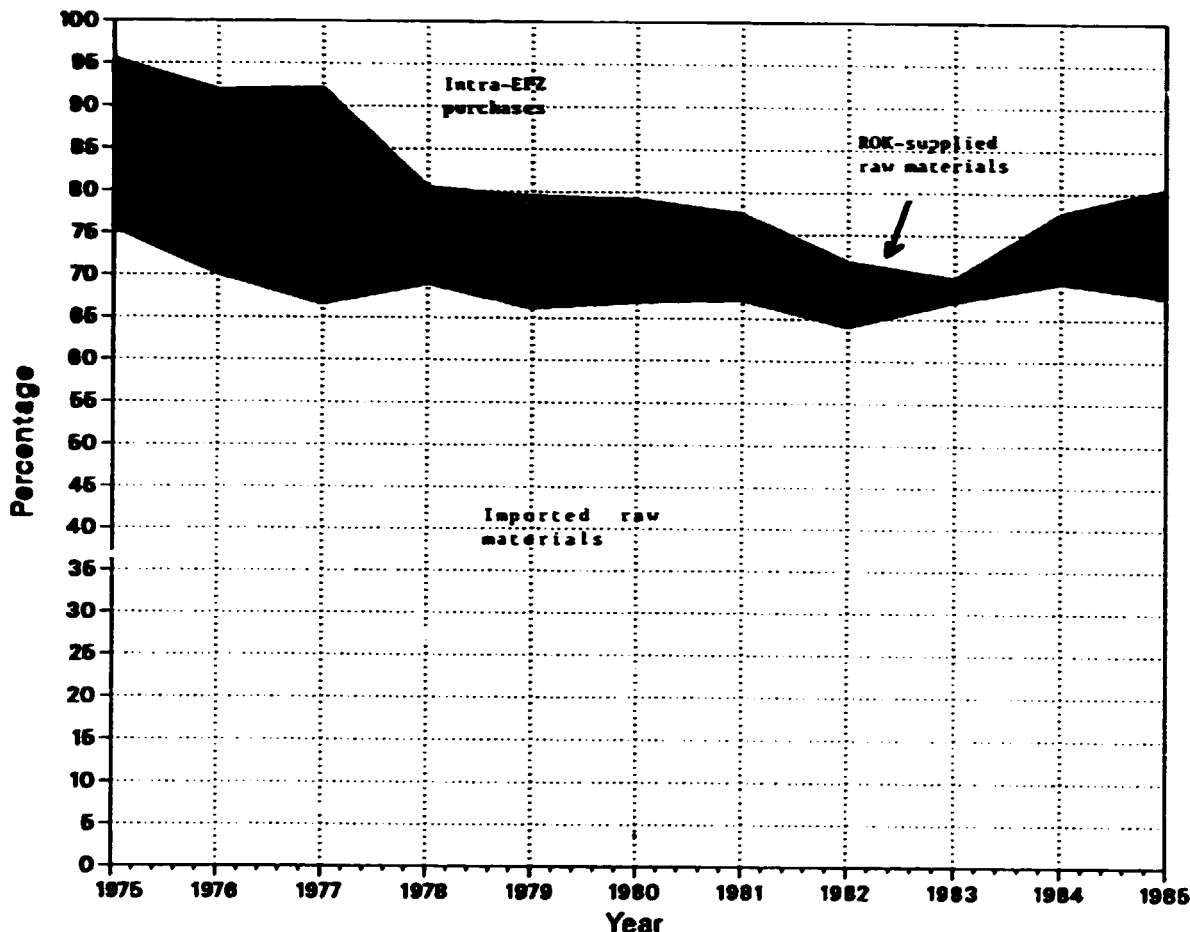
2/ This definition of the local content ratio is based on a number of counterfactual assumptions necessitated by the lack of further data:

- All wages have been included thus neglecting the role of expatriate labour.
- All profits have been excluded thus neglecting the role of reinvested profits.
- Only direct effects have been taken into account thus neglecting the import content of domestically supplied raw materials which (at least in the case of those supplied from within the EPZ) can be expected to be very high.



Figure 2

### MASAN EPZ: COMPOSITION OF RAW MATERIALS USED, 1975-1985



and 1983 (when it further increased to approximately 30 per cent), it remained at a level of around 20 per cent. The obvious conclusion to be drawn is that in 1978 a drastic shift in the sourcing behaviour must have taken place in favour of EPZ-based firms and at the expense of ROK-based suppliers. No information about the nature and the determinants of this shift is available. It is conceivable, however, that Korean supplying companies (or just one big supplier) relocated their production from outside to within the EPZ. Whatever the reasons, the significant and changing role of intra-EPZ transactions in itself is an important finding which in the past has received hardly any attention at all in the relevant literature. Further research would be required, however, to determine:

- the intensity of intra-EPZ transactions: are only a small number of companies involved or has a dense network of intra-EPZ transactions been established?;
- the branch origin of intra-EPZ transactions: are many branches involved or are they confined to electronic components?;
- the generation of intra-EPZ transactions: have they developed in an unplanned or planned manner? In the latter case, was it more by complementary foreign investment or by 'pulling' ROK-suppliers into the EPZ?

To sum up, it has been shown that the very high share of domestic in total raw materials of Masan EPZ (32.3 per cent in 1985) must not be equated with linkages having been created between EPZ firms and firms located outside the EPZ. The latter supplied only 12.9 per cent of all raw materials in the same year. Put into a regional comparative perspective, this share stands out, however, as being conspicuously high: in Sri Lanka's Katunayake EPZ the share of domestic in total raw materials reached 4.9 per cent (1978-85); in the Philippines the corresponding figure was 0.6 per cent for the Baguio EPZ and 4.1 per cent for the Mactan EPZ (both figures for the 1981-85 period);<sup>1/</sup> for all EPZs in Malaysia taken together just 2.9 per cent (1980-82) of all raw materials were supplied from domestic firms outside the EPZs and another 5.7 per cent by way of intra-EPZ purchases.<sup>2/</sup>

#### 5. Linkage determinants: Policy-induced or market-induced?

In the preceding sections it has been demonstrated that Korean EPZs have established significant linkages with the domestic economy though only to a minor degree with domestic firms outside the EPZs. Yet they clearly represent an exception to the general rule of EPZs being almost entirely dependent on imported raw materials.

In general, EPZs both in the Republic of Korea and elsewhere are characterized by a bias in favour of import-intensive operations and EPZ-based firms show a preference for buying material inputs from their parent companies abroad unless they can buy locally products of the same quality standard and at internationally competitive prices. To the extent that local suppliers meet these conditions there is no reason to believe that EPZ-based firms will not take advantage of local supply. Not only are there some transport cost advantages but the very act of establishing contacts with domestic firms can lead to a growing involvement in the domestic economy with the prospect of being allowed to sell an increasing proportion of output in the Republic of Korea in the future.

Industrial production in the Republic of Korea has become increasingly competitive on a world plane. In 1987 the country's estimated current account surplus was \$10 billion. As from 2 January 1989 the country will no longer

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1/ Figures for Sri Lanka and the Philippines have been taken from ongoing UNIDO studies. They presumably even include small amounts of intra-EPZ purchases.

2/ Calculated from data given in Warr 1987, p.39.

receive GSP treatment in the USA. The appreciation of the Japanese Yen since 1986 has further contributed to making Korean goods more competitive internationally. More than anything else, it is this growing competitiveness and the increasing industrial sophistication that have induced EPZ firms to use more material inputs from Korean suppliers.

This was confirmed by a number of firm level interviews carried out in Masan and Iri in the context of this study.<sup>1/</sup> The case studies clearly revealed that in no case did management suggest that its decision on the domestic/imported material inputs ratio was governed by anything other than commercial principles. If the domestically produced inputs were priced competitively with overseas sources of supply and if the products were of sufficiently high quality then all firms indicated perfect willingness to buy locally. In fact, some firms were even willing to give a certain margin of preference to inputs produced in the Republic of Korea - possibly for the reason of establishing long-term commercial links with Korean industry which might be useful in the future; possibly also to indicate to the Government that they were 'responsible' companies. Indeed, a few companies pointed out that they were buying locally produced components even though the quality was slightly inferior to the previously imported variety. This had caused productivity to decline because of higher rejection rates but the impression left at the interviews was that this was being tolerated temporarily and that efforts were being made to help suppliers improve quality control.

None of the interviewed firms seemed particularly interested in selling on the domestic market - presumably because export sales were buoyant and, frequently, foreign marketing was arranged by the parent company. The impression created was that whilst firms welcomed the increasingly liberal attitude of the Government in permitting domestic sales they were as yet only willing to 'sound out' the market and to establish a small niche which could possibly be extended in the future. One firm (in the garment industry) expressed no interest at all in the Korean market because since its products would be treated as foreign products so far as the Republic of Korea was concerned they would be subject to a high tariff and consequently would be uncompetitive with the domestically produced goods.

In no instance did a firm suggest that any pressure was brought to bear on it by the Government of the Republic of Korea or Zone Administration to purchase material inputs locally. Rather, the Government has 'encouraged' firms in the EPZs to do so. It has realized, sensibly, that it cannot compel an EPZ firm to buy locally, yet firms are under no illusions about the Government's desire for them to purchase local inputs. Japanese firms in particular, which comprise the majority of those in the EPZs, are well used in their home country to the advantages of abiding by government guidance.

To sum up: all the indications are that whilst it is a policy objective of the Korean Government to encourage EPZ firms to use local materials there

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<sup>1/</sup> No attempt was made to select a statistically significant sample of firms. Selection was governed by an attempt to identify firms in a range of industries and by the willingness of company management to be interviewed. The Administration Offices of the two EPZs are particularly thanked for their assistance in the selection of firms and in the practical arrangements for the interviews.

has been no directive to do so nor has there been any subsidy or other policy instrument specifically tailored to EPZ firms used to make effective that encouragement. Local sourcing has been brought about largely by moral suasion on the part of the Government (and of the Zone Administration) and commercial reasoning (including expected long-term benefits) on the part of the EPZ-based firms.

However, there do appear to be at least two general economic policy measures which may have stimulated the use of local material inputs:

(i) In 1979, The Government established a Machinery Purchase Fund which finances the procurement of Korean made machinery by private business. Presumably there is no reason why firms (or, at any rate, Korean firms) in the EPZs could not avail themselves of this facility. It appears that demands on the Fund have been heavy in 1986. Whilst in previous years 50 per cent of the Fund remained unused due to the lukewarm response of business, in the first eight months of 1986 Won 225 billion or 83 per cent of the available loanable funds were borrowed. The surge in demand has come from (a) the general dynamism of the economy; (b) the growing price competitiveness of Korean machinery and (c) the growing sophistication and variety of Korean machinery.

(ii) The second promotional measure is the use of variations in the loanable funds rate on Letters of Credit. Effectively a "rediscount" operation, the Bank of Korea from time to time sets new Won rates per US \$1.00 for four categories of transactions: production of export goods; purchase of domestic raw materials; import of raw materials for export use; and purchase of domestic finished goods. The rates, and how they have changed since 1985, are set out in Table 23.

Table 23. Letters of credit: Loanable amount for various economic activities, 1985-1986

Item	Won per US \$1.00 of L/C a/			Per cent of L/C a/ value borrowable b/		
	1985 to 24.7.86	25.7.86 to 12.9.86	From 13.9.86	1985 to 24.7.86	25.7.86 to 12.9.86	From 13.9.86
Production of export goods	750	730	700	84.5	82.2	78.8
Purchase of domestic raw materials	820	800	780	92.3	90.1	87.8
Import of raw materials for export use	570	550	530	64.2	61.9	59.7
Purchase of domestic finished goods	630	610	590	70.9	68.7	66.4
Weighted average	740	720	690	83.3	81.1	77.7

Source: Bank of Korea as quoted in Korea Times, 25.7.86, and Korea Herald, 11.9.86.

a/ Letter of Credit.

b/ On basis of exchange rate of W 888 = US \$1.00.

It appears that the exchange rate applied for the purchase of domestic raw materials has consistently been the most favourable. In addition, from 1985 to 24 July 1986, for example, it was possible to borrow 92.3 per cent of the face value of a Letter of Credit when buying Korean inputs. If raw materials were being imported for export use only 64.2 per cent of the value could be borrowed. All the rates went down twice subsequently but relativities remained constant (the reason for the general reduction in the rates is the desire on the part of the Government/Bank of Korea to remove some of the "heat" from the economy through fears of renewed inflation - it is a step towards reducing liquidity).

The relatively favourable Won/\$ rate for Letters of Credit for the purchase of domestic materials is applicable to all Korean manufacturers. Thus producers in the EPZs are not especially favoured. This comment again underlines the importance in the case of the Republic of Korea of not regarding the EPZs as being radically different from the rest of the economy.

#### IV. THE FUTURE ROLE OF EPZs IN THE REPUBLIC OF KOREA

The quotation presented below - taken from a recent OECD study on Free Export Processing Zones (FEPZ) - succinctly summarizes the life cycle concept of EPZs and specifies the various stages through which EPZs in general may be expected to go. The framework is suitable for examining the possible future of Masan and Iri EPZ.

"The life of the FEPZ would thus follow a succession of cycles in which successive kinds of specialization are acquired in turn, with each cycle comprising the following phases:

- In the first phase the FEPZ is provided with basic infrastructures and appropriate facilities. This phase is characterized by significant foreign investment flows.
- In the second phase of expansion the foreign investment flows continue to increase in absolute terms, but decline in relative terms. Exports expand strongly while the FEPZs occupancy rate reaches its maximum.
- The third phase is that of maturity. While the foreign investment flows tend to level off, exports increase at a slower rate than before and small marginal businesses tend to be replaced by larger enterprises employing staff with better technical training.
- The characteristic feature of the fourth and final phase is disinvestment by the foreign enterprises whose assets are as a rule taken over by local interests.

The end of this final phase should mark either the start of a new cycle in which the FEPZ turns towards more sophisticated manufactures, or the beginning of the phasing out process as the zone has become superfluous with the creation of industrial structures capable of developing independently.

This second possibility leads on to the more general question of the relationships that may exist between the life cycles of FEPZs, and the development cycle of the country in which they are established. Thus changes in conditions in the host country will affect the manner in which that country's authorities perceive the role of the FEPZs, independently of their age. For example, insofar as employment ceases to be the primary objective, the zone might play an important role in attracting foreign investment involving high value added. This would no longer mean a decline in investment in the FEPZ as it "matures", but simply a change in the zone's industrial structures accompanied by new partners, in conformity with the pace and objectives of development in the host economy."<sup>1/</sup>

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<sup>1/</sup> Basile and Germidis 1984, pp.60/61.

In Masan's case it is fairly evident that the third phase of maturity has been reached; in real terms cumulative investment in 1985 was practically the same as in 1981. As for Iri, its cumulative investment is still increasing, albeit not rapidly; in 1985 it was 13 per cent higher in real terms than in 1981. Occupancy rates in both EPZs are effectively 100 per cent - but "occupancy" is measured only in terms of a physical concept, ignoring economic criteria. It would probably be true to say that Iri is about to enter the third phase.

There is no strong indication, however, that Masan has entered the fourth stage in the scheme, where foreign disinvestment takes place and the assets are taken over by indigenous capital. In Masan only 10.5 per cent of cumulative capital investment as of June 1986 was owned solely by Korean nationals; data on the Korean equity share in joint ventures are not available. With regard to the number of firms, however, there do seem to be signs of increasing Korean investment in Masan, and in Iri the number is quite large. In Masan the number of Korean firms grew from 7 to 12 between June 1983 and June 1986; in the former year Korean firms in Iri amounted to 10.

However, the fourth phase is not necessarily the way Masan and Iri are likely to develop. A more probable path is the one which was characterized as leading to "a change in the zones' industrial structures accompanied by new partners, in conformity with the pace and objectives of development in the host economy". What this could imply in the Korean development context, will be outlined further below.

What is clear is that Masan and Iri EPZ have effectively reached the end of the road so far as their status as EPZs is concerned. This seems to have been realized in the Republic of Korea as long ago as 1983 as the following quotation shows:

"The future of Korean EPZs is undetermined. Expansion of existing EPZs or creation of a new one is hardly predictable. However, to utilize the existing EPZs for other purposes is an immediate issue to be resolved by policymakers. Some participating foreign enterprises are primarily interested in exploitation of the tax incentives accorded to them and the low-cost labour. But several foreign investors in the EPZs have voiced their intention to sell their equity and repatriate their capital. It is worthwhile to note that the tax exemption and reduction period is running out. Of the Masan EPZ participating enterprises, for example, 68 are already beyond the tax exemption and reduction period, and only 5 firms are in the tax reduction period. To most of them, the scheme of tax incentives accorded to foreign investors is losing its attractiveness... Iri EPZ could be very likely viewed as in its late maturity stage... Masan EPZ... was fully occupied by 1974 and its tax exemption period is expiring for most of the occupant enterprises. In the future, new investment could be accepted only if, as and when some of the existing firms decide to withdraw from Masan EPZ. The Korean Government is encouraging participating enterprises to increase their investment, introduce superior technology to produce technologically more intensive products, and expand subcontracting to firms outside Masan EPZ."<sup>1/</sup>

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1/ Kim, Jong-Nam 1983, pp.2, 23, 24. In 1983 Jong-Nam Kim was Director-General of the Industrial Policy Bureau in the Ministry of Commerce and Industry.

If these perceptions were gaining ground in 1983 the trend of events since that time will have led undoubtedly to a strengthening of the view that new roles must be found for the EPZs.

As long ago as in 1978 the need was recognized in the Republic of Korea to restructure production towards a skill and technology-oriented direction, as the following statement by KDI shows:

"In view of the limited availability of financial and natural resources, Korea is better suited for attaining a comparative advantage in the skill and technology-intensive industries than in the highly capital-intensive industries. In particular, it is reasonable to expect that we will have a greater comparative advantage in such high value-added and resource-saving industries as electronics and machinery in the future. In these areas Korea is less constrained in terms of land, water, and other industrial environmental conditions than the major industrial countries in Europe and Japan are. Furthermore, the nation has the advantage of being able to choose the most up-to-date production processes and equipment, and high quality labour is still available at costs much lower than in advanced countries."<sup>1/</sup>

The country has indeed been moving in this direction. To some - albeit partial - extent the EPZs have followed suit. It would appear though that so far not enough has been done to actively stimulate resources to move from labour- and low-skill intensive activities in Masan and Iri into high-tech, skill-intensive vanguard industries. If such transformation is not accomplished the Zones will decline even more rapidly and lose their relative importance in Korean production and exports. The zones will thus fall behind the country's new industrial development pattern.

Among the factors that can be expected to accelerate the structural changes outlined above is an upward pressure on wages. The tendency of real wages to rise has resulted from a number of interlinked developments such as emerging labour scarcities in specific skill categories, the strengthening of trade unions and the introduction of minimum wage legislation. The latter is to eradicate salaries of less than Won 100,000 per month (approximately \$115 at the 1986 exchange rate). As those industries predominant in EPZs (textiles, garments, electric and electronic goods) account for the majority of salaries below this level, EPZ industries will be subject to increased labour costs. Some of the most labour-intensive companies are then likely to relocate to cheaper locations or, alternatively, to introduce new labour-saving technologies.

The major issue in this context is to define the role to be assigned to the country's EPZs in an environment of accelerated structural changes towards more sophisticated, skill-intensive and increasingly R&D-dependent industries. Obviously, the choice is between phasing them out or transforming them to suit the new economic environment. Depending on which route will be taken they will soon become either a "relic of the past" or be turned into a "mechanism of the future".<sup>2/</sup>

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<sup>1/</sup> KDI 1978, p.55.

<sup>2/</sup> Krause 1985, p.22.



The obvious approach to be taken is to phase out inappropriate unskilled-labour-intensive activities and to build up a new estate structure which will stimulate the entry of high-tech, skill-intensive industries funded either by Korean or foreign capital. This could be achieved either within a gradual process of change induced by applying more specific targeted approval criteria or by forward-looking political efforts and investments to establish the kind of technological infrastructure required to speed up the envisaged transformation process. The latter would essentially imply a close association of local universities and technical colleges with product and process innovation in the zones within a broader Science Park environment.<sup>1/</sup>

In general, the establishment of high-tech industrial zones or science parks is a long-term commitment often bearing fruit only after an incubation period of 10-15 years and involving large-scale public and/or private expenditures. Its success depends on a number of important preconditions, among them above all "a good research and teaching structure in at least one branch of technology; an environmentally attractive site ... and ... the availability in the region of a nucleus of persons of both the required calibre and the conviction that they can drive the project along."<sup>2/</sup>

The number of science parks so far established in developing countries is extremely small. The most prominent example is the Hsinchu Science-Based Industrial Park in Taiwan Province of China,<sup>3/</sup> which testifies to the possibility of rapid progress in a realistic planning framework. Founded only in 1980, the Hsinchu Park has attracted 73 research-based companies (some 40 per cent locally owned), predominantly from the electronics industry. In 1987 these companies generated a total production value of approximately \$700 million (which was close to the Masan EPZ production value of \$810 million in 1985). The main objectives in establishing the Hsinchu Park were to speed up industrial restructuring towards more knowledge-intensive production in view of the declining role of traditional EPZs, to create proper jobs for highly skilled local workers and to promote domestic entrepreneurship. The Hsinchu Park occupies a total area of 2,000 hectare of which approximately 10 per cent have been designated duty-free; this limited area of 200 hectare may thus be considered a true science-based EPZ.

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1/ The development of special zones focussing on high-tech industrial development is a fairly recent trend in many, mostly industrialized countries (cf. OECD 1987). Terminology is not yet well-established; the following distinctions, however, appear appropriate (cf. Currie 1985a):

- innovation centres: restricted space intended primarily to induce establishment of small high-tech companies and newly established ones in the initial phases of operation;
- science parks: larger areas of land suitable for knowledge-based firms of differing sizes and stages of development; research-intensive manufacturing is permitted and encouraged;
- research parks: similar to science parks, but permitting manufacturing only up to prototype level.

2/ OECD 1987, p.22.

3/ Cf. Far Eastern Economic Review, 22 January 1988 and Asian Finance, 15 September 1983.

All three objectives mentioned above would be equally valid in the Korean context so that in general terms the establishment of a science park would appear to be a suitable step to be taken in the country's current stage of development. However, two important caveats need to be made.

Firstly, the intention being to convert an already existing EPZ into a science park, it would be crucial to ascertain the interest of the present EPZ companies in this new approach. Should they be reluctant to participate in an overall upgradation effort (including hiring of more highly qualified staff; introduction of new technologies; carrying out research and development), then the whole concept is likely to fail. It is hardly conceivable to start a new high-tech investment drive with a massive walk-out of existing foreign industries. If, however, particularly the more sophisticated companies (electronics, precision machinery) were to cooperate in the restructuring exercise, then the existing EPZs could become nuclei of large science parks to be built up in the medium run.

Secondly, any endeavour in the direction set out above would need to be reconciled with the country's overall strategic planning in the fields of R&D and high-tech industries. In particular, it would need to be analyzed if and how new science parks could be complementary to and linked with the ongoing efforts to establish the Daeduk Science Town<sup>1/</sup> close to Daejon. Daeduk Science Town, located at the centre of the country's transportation systems, is to become the focal point of research support for high-tech industries. The initial Master Plan of Daeduk Science Town was prepared as early as in 1973; it was subsequently revised in 1978, 1981 and 1984. According to the present plan, the target year for completion is 1991 when Daeduk Science Town is expected to host 10 government funded research institutes and 23 private industrial research institutes. Table 24 provides an overview of those institutes already established in Daeduk.

All in all, it appears that the conversion of the two existing Korean EPZs into elements of science-based industrial parks would be a logical step in their development. As the present study has shown, they have never been radically different from the country's overall economic conditions. In the future, however, this may increasingly be the case should industrial policies fail to make them an integral part of imminent structural changes in the Korean economy.

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<sup>1/</sup> Cf. Suh 1987.

Table 24. Research institutes located in Daeduk Science Town  
(as of June 1987)

Research Institutes	Date (moved or constructed)	Functions	Personnel
<b>A. <u>Government-funded research institutes</u></b>			
The Korea Standards Research Institute	1978	Establishment of national standards system	394
The Korea Research Institute of Chemical Technology	1978	Testing and research on technology related to technical industries	422
The Korea Advanced Energy Research Institute	1978	General R&D related to atomic power	1,438
The Daeduk Shipbuilding Research Station of KIMM	1978	Research on machinery, metals and shipbuilding	208
The Korea Institute of Energy and Resources	1979	Geological exploration and research on utilization of land and marine resources	357
The Korea Electronics and Telecommunications Research Institute	1983	Testing and R&D related to electronics and telecommunications	1,278
The Korea Ginseng and Tobacco Research Institute	1984	Testing and R&D related to cultivation and ingredients of ginseng and tobacco	341
Institute of Space Science and Astronomy	1985	Research on astronomical observation and space sciences	60
The Korea Science and Engineering Foundation	1983	Enhancement of research capabilities, incl. international co-operation	51
<b>B. <u>Private industry research institutes</u></b>			
The Sangyong Central Research Institute	1979	Research on cement production processes and development of new products	135
The Lucky Central Research Institute	1979	Research on genetic engineering high polymer and medical supplies	242
The Hanyang Chemical Central Research Institute	1979	Research on petroleum-related industries	98

Source: Suh 1987.

## V. CONCLUSIONS AND IMPLICATIONS FOR OTHER DEVELOPING COUNTRIES

In the Republic of Korea EPZs have been in operation for approximately 15 years. They have contributed to industrial employment and manufactured exports without, however, having reached substantial shares of the national totals in either case. From the very beginning, the Korean EPZs have been an integral element of a general export-oriented industrialization strategy and an overall industrial estates concept.<sup>1/</sup> The latter in particular may have facilitated and induced the provision of local material inputs although additional research would be required to establish the exact relationship between EPZs and other industrial estates, particularly those located at the periphery of EPZs.

As has been shown, significant linkages have been created by EPZ enterprises in terms of purchases of domestic material inputs, reliance on domestic services (transportation, finance, insurance, packaging etc.) as well as subcontracting arrangements. While services due to their non-tradable nature are a "natural" linkage component in all EPZs, domestic purchases on the one hand and subcontracting on the other hand have developed in the case of the Korean EPZs to an exceptionally high degree as compared to EPZs in other developing countries. In sum, the local content of production, i.e. the value retained in the country, has reached more than 50 per cent in Masan EPZ (1985).

It has been further demonstrated that the establishment of backward linkages via domestic sourcing of inputs has not primarily been the result of specific local content policies but rather a market-induced, i.e. supply-oriented process initiated by the EPZ-based companies themselves - within an overall climate of government encouragement. The evidence from Korean EPZs as presented in this study is fully in line with the results of studies of linkage creation by transnational corporations in general, and those located within EPZs in particular,<sup>2/</sup> as summarized below.

Firstly, the degree of linkages varies between different industrial branches depending upon the production process, the complexity of technology and the extent to which economies of scale can be achieved. The electronics industry is an illustrative case showing how a highly separable production process coupled with high economies of scale in component manufacture has led to an intense reliance on subcontracting arrangements. When looking, however, at purchases of local raw materials, other industrial branches have proven to have a higher "linkage propensity" in accordance with raw material availabilities in different countries: in Korea's Masan EPZ the manufacture of ferrous metals and of footwear exhibited the highest share of domestic in total raw materials whereas in Sri Lanka's Katunayaka EPZ the same applied to the manufacture of rubber and coir products.

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<sup>1/</sup> Annex A provides an overview of industrial estates in the Republic of Korea.

<sup>2/</sup> Cf. Lall 1979; Lim and Pang Eng Fong 1982; Spinanger 1984; Warr 1987; ESCAP/UNCTC 1985; UNIDO 1980; UNIDO 1986.

Secondly, the creation of linkages is influenced by firm-level determinants. This concerns, inter alia, the degree of autonomy given to subsidiaries of transnational corporations in their sourcing decisions. In this sense, the linkage potential is a matter of corporate philosophy and thus, indirectly, also of the investing firms' country of origin.

Thirdly, and most importantly, the economic conditions prevailing in the host country effectively influence the scope for backward linkages spreading from EPZs. Although both the liberal regulations governing EPZs (duty-free import of raw materials and intermediates) and the motives of companies investing in EPZs (utilization of low-cost labour for export production) would appear to militate against attempts at integrating them with the host economy, there is ample evidence that EPZ-based firms are interested to take advantage of domestic supplies unless these fail to comply with cost and quality requirements. Moreover, as has been also confirmed by interviews carried out for the present study, "the multinationals were willing to bear the initial costs of encouraging and patronizing local suppliers, who in the long run would be cost-competitive."<sup>1/</sup> Hence it is hardly surprising that Spinanger - in a comparative study on Asian EPZs - found the share of inputs sourced from the domestic economy to be strongly correlated with per capita incomes the obvious conclusion being that "the establishing of linkages is basically dependent upon the level of development of the host country."<sup>2/</sup> Needless to say that time itself is another relevant factor in the sense that the identification of competitive suppliers and the establishment of a commercial relationship require a certain period. In the Korean case this period has been shown to be relatively short, however.

To emphasize the relationship between the level of industrial development and the level of linkage creation may appear to be trivial. Yet, in many cases the frustration of policy-makers about their countries' EPZs remaining enclaves would be avoidable were only the sine qua non of local input availability assessed properly.

Indeed, in the absence of efficient local suppliers the impact of specific policy measures aimed at increasing the level of linkages is bound to remain small. For example, linking tax incentives to the level of purchases from domestic firms "will not in itself cause the domestic industrial development which must occur for a significantly greater linkage with the FTZs to be possible."<sup>3/</sup> At the same time, compulsory linkage requirements will most likely be counterproductive just as local content regulations in general "can, if improperly applied, be inefficient and cause considerable waste of resources (through excessive unit cost of production and low quality of final output) and hence damage the development efforts."<sup>4/</sup>

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<sup>1/</sup> Lim and Pang Eng Fong 1982, p.591. (The statement refers to electronics companies in Singapore.)

<sup>2/</sup> Spinanger 1984, p.66.

<sup>3/</sup> Warr 1987, p.53.

<sup>4/</sup> UNIDO 1986, p.vii.

This leads back to the issue of incorporating the establishment of EPZs in a favourable overall policy framework. In the case of the Republic of Korea, a number of important policy reforms were in fact adopted prior to the establishment and in the early years of Masan EPZ's existence. These concerned changes in the import control system, a tariff reform as well as interest rate and exchange rate adjustments. This is not to say that the particular policies followed by the Republic of Korea may be considered suitable for every developing country. What is important, however, is that other developing countries - in their attempts to emulate the success of the Korean EPZs - should take into account the overall framework within which these have operated: all too often EPZs have been considered as though they operate in a vacuum.

In the case of the Korean EPZs a number of factors conspired to work favourably for their success. Masan EPZ came in on the heels of a realistic exchange rate, a partially liberalized import regime (switch from positive list to negative list system in 1967), a low inflation rate as well as rapidly expanding international trade. Hence, it appears that it was the success of the Korean industrialization strategy (coupled with a conducive international economic environment) that made the country's EPZs work successfully, not the other way around.

Thus developing countries contemplating the establishment of an EPZ are left with a basic dilemma: "The poorer the industrial infrastructure of the country and the greater the incentives for import substitution, the more necessary a zone may be to achieve any significant growth of manufactured exports at all. On the other hand, the more a zone is an enclave, atypical of the infrastructure and incentives available outside, the less successful the zone is likely to be in achieving wider economic benefits."<sup>1/</sup> In other words: EPZs have proven to be a useful additional instrument to strengthen a country's overall export drive rather than a means to take a leap from domestic market orientation into manufacturing for the world market. This implies that in general the developmental impact of EPZs has tended to be overstated: Where they have been successful, only a small portion of the attracted investment may be considered of an additional nature whereas they have often failed to reach their objectives when set up to initiate the attraction of foreign investment.

At present, developing countries thus would be well advised to act very cautiously when planning to establish new EPZs. Firstly, as outlined above, any EPZ needs to be integrated into a country's overall industrial strategy. Secondly, the wave of newly established EPZs in the seventies has created global conditions of oversupply in what may be considered an international market for EPZ-type investment locations. The situation is one of fierce competition among already existing EPZs for obviously declining amounts of foreign investment. This explains - apart from domestic factors - why second generation EPZs such as those in Bangladesh and Pakistan have fallen short of expectation.<sup>2/</sup>

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1/ UNIDO 1980, p.39. Cf. also Edgren 1984, p.49.

2/ Cf. ESCAP/UNCTC, p.94.

Thirdly, the benefits which may nevertheless flow from the establishment of an EPZ are not costless, i.e. the government has to consider the opportunity cost of allocating resources to the setting-up and maintenance of the zone as compared to other possible uses to which the resources might have been put in the economy. This entails such difficult issues as estimating revenue foregone by the government through various types of investment incentives. Even beyond these calculations, two further questions remain: Would generalized incentives to attract foreign investment be able to lead to an equal (or greater) inflow of capital? Would different economic policy measures (such as a devaluation) induce greater exports than any EPZ was likely to produce?

In general, developing countries deciding to enter the EPZ competition would be well advised to adopt a modest and limited set of related objectives, particularly if their level of industrial development is relatively low. In these cases, the creation of additional employment opportunities and the generation of a certain amount of net foreign exchange earnings would appear to be potentially realistic objectives whereas other impact dimensions such as linkage effects or technology transfer may be regarded as "desirable externalities".<sup>1/</sup> Again, rather than burdening EPZs with overly high expectations and far-reaching goals, they should be viewed as just a specific policy measure within an overall strategy.

For those countries already operating EPZs the essential tasks would be to continuously monitor their performance and review their functions and objectives with a view to respond to challenges emerging both from structural changes in the domestic economy and from new trends in the international economic environment, including the changing demands of foreign investors vis-à-vis potential investment locations. For example, attempts to attract technologically more sophisticated lines of production may necessitate a prior upgradation of an EPZs infrastructural facilities as well as the availability of highly specialized industrial services.<sup>2/</sup> In the past, a number of EPZs have moved away from the rigid initial concept of being designed to host exclusively foreign investment producing goods exclusively for export markets. More flexible regulations have been adopted in many cases and this process may be expected to continue in the future. Specific elements of this process have been:

- the permission for EPZ companies to sell part of their output to the domestic market. While this meanwhile applies to many EPZs (including those in the Republic of Korea), the Mexican in-bond industries (maquiladora industries) are a particularly interesting case in point.<sup>3/</sup> Within a system of conditionality up to 20 per cent may be sold locally if certain local content requirements are met, if net foreign exchange earnings remain positive (after deduction of the foreign exchange cost of local sales) and if technical assistance is provided to local suppliers;

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1/ Kwasny 1983, p.62.

2/ A recent UNIDO study (cf. UNIDO 1987b) on foreign direct investment in the machine tool industry has found the existence of local computer software specialists e.g. to be a much more important investment precondition than generous financial incentives.

3/ Cf. Kwasny 1983, p.15.

- the possibility for specific companies to locate outside an EPZ while taking advantage of EPZ regulations and administration. This has been the case e.g. in Sri Lanka with regard to some companies processing domestically available raw materials (rubber) where proximity to the supply sources has been considered essential for either economic or technical reasons;
- the admission of domestic investors into an EPZ, either on a joint venture basis or even in the form of 100 per cent domestically owned enterprises. The latter option e.g. was opened to Korean nationals in 1980;
- the establishment of sub-contracting arrangements between EPZ companies and domestic companies.

These tendencies towards a higher flexibility in managing EPZs may contribute to enhancing their resilience and, by increasing the degree of their interactions with the whole economy, may also facilitate their gradual transformation in response to changing economic conditions, if and when required.



ANNEX A

Industrial Estates in the Republic of Korea

Annex A provides information on the entire concept of industrial estates in the Republic of Korea, of which the EPZs are but a sub-set. Annex B focusses first on the overall characteristics of EPZs in the Republic of Korea and then looks more closely on Masan EPZ and Iri EPZ separately.

The Government has stated that to keep pace with rapid economic development, it is actively promoting the establishment of industrial estates. All the enterprises located in industrial estates enjoy preferential treatment. Plant sites can be easily purchased or leased at considerably lower prices than in other areas. Further, various support facilities and services such as electric power, industrial water, transportation, telecommunication, stevedoring, and packing are provided. In addition, these estates offer a full range of infrastructure and other auxiliary services such as a customs office, a bank, a labour office, a quarantine station, and an immigration office. Perhaps most important, however, are the tax concessions granted to foreign-invested enterprises under the Foreign Capital Inducement Act<sup>1/</sup>.

Foreign investors may either own or lease land throughout the Republic of Korea. Foreign nationals are subject to the regulations of the Alien Land Acquisition Law, which requires that foreign-invested firms which hold over 50 per cent ownership of stocks or shares in a corporation need only obtain approval for land ownership from the local government. Bonded warehouses<sup>2/</sup> and factories<sup>3/</sup> may be established at any point in the industrial estates with the approval of the Office of Customs Administration.

The Government established industrial estates initially in the 1960s to promote rapid growth and industrialization. Altogether, 26 estates (including 2 EPZs) have been established throughout the country up to 1986. As of December 1984, 3,333 enterprises were located in the estates, covering a total area of 137 km<sup>2</sup>.

The industrial estates were designed to rearrange industries for balanced growth among regions, controlling pollution and grouping strategic export industries. Among others, Kumi Electronic Industrial Estate, Changwon Machinery Industrial Estates and Yochon Petro-chemical Industrial Estate were

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1/ See Appendix C.

2/ Bonded warehouses are places designed to store primarily foreign goods for a long time. Duration of storage is two years for foreign goods and six months for domestic goods.

3/ Bonded factory means a place for manufacturing, processing and performing similar work in bonded state using foreign goods, or both foreign and domestic goods as raw materials. A licence from the customs collector is required for the establishment of a bonded factory. Eligible for such a licence are factories manufacturing export goods under the transfer formula between head and branch offices and between accounts.

specifically designed to upgrade strategic industries and to raise the level of technology in the Korean economy.

The laws governing industrial estates are:

- The Export Industrial Development and Formation Law;
- The Free Export Zone Establishment Law; and
- The Local Industry Development Law.

All the industrial estates are open to foreign capital investment.

Apart from the EPZs the estates may be divided into the following categories:

A. Direct-controlled industrial estates

These types of manufacturing facilities have been designated as necessary to upgrade specific types of industry and to provide technological contributions to the country's economy. Various tax exemptions and reductions and several other kinds of advantages are offered to the occupant-enterprises in these estates.

(i) Korea Export Industrial Estate

This estate was created to accommodate medium and small-sized export firms by providing such industrial facilities as low-cost land, adequate power and water and administrative support. There are almost no restrictions on eligible types of industry other than on those industries that pollute the environment. There are 6 sub-estates under the estate, 3 in Seoul and 3 in Inchon.

(ii) Kumi Industrial Estate

Kumi's primary function is the development and production of electronic equipment. In order to attract foreign investment by enterprises involved in advanced electronics, the Government allows sole ventures by foreign investors to operate within the estate.

(iii) Changwon Industrial Estate

This industrial estate is a large-scale integrated machine industry complex built to attract large machine industries that are competitive in international markets, and to ensure the development of the heavy and chemical industries in the Republic of Korea.

(iv) Yochon Industrial Estate

Yochon was designated as a petrochemical centre in 1973, in order to meet the fast-growing domestic and export demand for oil-related chemical products. This estate has 4 piers for convenient loading and unloading.

(v) Iri Industrial Estate (in addition to the Iri EPZ)

This estate was established in 1973 in order to promote exports. There are almost no restrictions on the eligible types of industry. In 1975, a new estate was created for the processing of precious metals and jewels.

(vi) Onsan Industrial Estate

Recently, the rapidly growing demand for non-ferrous metals and the increasing necessity to establish a domestic supply of such products, to reduce the level of imports, have spurred the industry's development and resulted in vigorous investment in equipment. The Government has worked out a plan to construct a wide network of non-ferrous metal smelters and refineries at Onsan within the framework of the Heavy and Chemical Industry Promotion Program.

(vii) Panwol Industrial Estate

Panwol industrial estate is located along the west coast of the peninsula, near Seoul. It has recently been established by the Government to promote the relocation of small and medium-sized firms that discharge excessive polluting substances.

B. Local Industrial Estates

These have been established throughout the country to attract new industries with a view to promoting regional industrialization. There are no limitations on the eligible types of industry and no restrictions on the domestic sale of products produced in these estates. Various tax exemptions and reductions are enjoyed by the occupant-enterprises in these estates. The estates now number 14.

C. Private Industrial Estates

Two private machinery industrial estates were established at Incheon in 1969 and at Seoul in 1970, for relocation and concentration of factories manufacturing machinery and equipment and related products. These are managed by privately incorporated bodies.

Sources: Korea Exchange Bank 1984; Ministry of Finance 1986 a, 1986 b; Korean Traders' Association 1985.

Facilities provided and conditions of occupancy in  
EPZs in the Republic of Korea

1. Eligible enterprises

- (a) Enterprises manufacturing, processing or assembling commodities for export.<sup>1/</sup>
- (b) Enterprises may be wholly owned by foreigners or be joint ventures with Korean nationals.

(The Minister of Trade and Industry reserves the right to determine the type of export enterprise.<sup>2/</sup> The minimum amount to be invested by foreigners is \$100,000.)<sup>3/</sup>

2. Eligible types of industry for zone occupancy

There are 21 types of approved industries as follows:<sup>4/</sup>

- 1. Food processing excluding processing of labour for export to Japan (CCCN 12.08).
- 2. Cosmetics.
- 3. Rubber products.
- 4. Leather products.
- 5. Packing materials.
- 6. Art printing.
- 7. Ceramic ware, excluding traditional pottery.
- 8. Non-ferrous metal products (only rolling of non-ferrous metal wire and processed goods of non-ferrous metal).
- 9. Steel products (CCCN 73.22-83.02), excluding cast-iron products.
- 10. Electronic products and accessories, excluding TV.
- 11. Machinery and apparatus.
- 12. Electrical appliances and equipment, excluding electric bulb and electric wire.
- 13. Yachts and small boats for recreation.
- 14. Optical appliance.
- 15. Medical and scientific appliances.
- 16. Precision machinery.
- 17. Musical instruments (only wood wind, brass and percussion instruments).
- 18. Furniture and decorative items.
- 19. Handicrafts, excluding wigs and false eyelashes (CCCN 67.04).
- 20. Toys (only metal toys).
- 21. Travel and sporting goods.

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1/ Complete components or full-finished goods may be exported. Law for the Establishment of a Free Export Zone, Article 8.

2/ Ibid., Article 9.

3/ Approval Guiding Principles for the Foreign Investor.

4/ Public Notification No. 77-168, 1970. Ministry of Trade and Industry.

It should be noted that:

- (i) those of businesses and kinds of products not listed and restricted types and kinds of products in the above may be allowed with the approval of the Minister of Trade and Industry if necessary,<sup>1/</sup> and
- (ii) the required ratio of foreign investment is dependent upon the business or product category.

3. Restrictions applying to the zones

- (a) Commodities introduced or imported into the zones are to be retained or used in bonded state<sup>2/</sup> only within the zones.
- (b) Commodities introduced or imported into the free zone and the finished good manufactured, processed or assembled in the zones may not normally be transported into the customs district. However, such commodities which are considered not harmful to domestic industry and must be inevitably carried into the customs district, may be carried there with the permission of the Minister of Trade and Industry.

4. Criteria for obtaining permission to be occupant enterprises<sup>3/</sup>

- (a) All export enterprises must comply with the regulations and objectives of the Free Export Zone.
- (b) The enterprises must have definite export prospects.
- (c) Enterprises must export products in relation to the area of land occupied (i.e. \$500 per pyong<sup>4/</sup>).
- (d) Leased factory (standard factory): Enterprises must export products in relation to the area of the building occupied (i.e. \$1,000 per pyong).
- (e) High net foreign exchange earnings are required. Calculated as follows:

Gross export value of products	-	Value of imports to produce export items	-	Remittance overseas of profits and dividends
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Gross export value of products

x 100 = Foreign Exchange Earning (Over 30 per cent required)

- 1/ Notification No. 88-19 of the Ministry of Trade and Industry.
- 2/ Law for the Establishment of a Free Export Zone, Article 2. (However, it is obvious that this Law has been modified since out-processing occurs and is increasing).
- 3/ Ibid., Article 8. and Article 8 of the Enforcement Decree of the Law.
- 4/ 1 pyong = 3.3m<sup>2</sup>.

(f) High labour-intensity :

(i) Owner factory: 15 or more persons per 100 pyong of premises.

(ii) Leased factory (standard factory): 20 or more persons per 100 pyong of the building occupied.

(g) A higher standard of manufacturing technology compared to that available locally.

(i) Technology to be made available to local enterprises for a minimum of one year to allow comparable industries to acquire the technology.

(ii) Technology which can contribute to the improvement of product quality and lead to an increase in exports even though the technology is already used by local industries.

5. Period of lease of land or plant

(a) The period of lease of land or plant, etc., is not to exceed ten years. However, if an extension of lease is desired, the Director-General of the Administration Office may extend the period up to a limit of an additional ten years.<sup>1/</sup>

(b) When an occupant-enterprise comes under any one of the following categories, the Director-General of the Administration Office may cancel the permission:

(i) If the enterprise has failed to initiate operation of its business within the period fixed by the ordinance of the Ministry of Trade and Industry after having obtained operating permission.

(ii) If the enterprise has violated the conditions of the permission.

(iii) If the enterprise has been punished for violation of the provisions of the Customs Law.

6. Major advantages and incentives of the zones

In general occupant-enterprises are given a waiver or easement from the application of the normal laws relevant to foreign investment, exports and taxes. Specifically:

(a) Duty free status:

Occupant-enterprises can manufacture, assemble or process export products using tax-free raw materials and semi-finished goods, most or all of which may be imported for the purpose.<sup>2/</sup>

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1/ Law for the Establishment of a Free Export Zone, Article 7.

2/ Ibid., Article 2.

(b) Taxes:

Income tax on unincorporated enterprises, taxes on dividends and surplus distribution and corporate tax, and property acquisition tax and property tax imposed on the properties acquired for the original purpose of the enterprises concerned shall be exempt in total or part as follows:

(i) Income tax, corporation tax, taxes on dividends and surplus distribution<sup>1/</sup> and property tax<sup>2/</sup> will not be assessed for five years from the first normal taxable date and property acquisition tax will not be assessed for five years from the date of registration of occupant-enterprises.

(ii) Income taxes on the salaries and wages of foreigners engaged by occupant-enterprises will not be levied for five years.

(c) Remittance of profits and capital:

(i) Overseas remittance of profits and dividends by foreign investors is guaranteed from the first year of operation.

(ii) Overseas remittance of principal possessed by foreign investors is guaranteed after two years of operation.

(d) Approvals etc.

Occupant-enterprises are free from the necessity of applying for lawful permission, approval, registration<sup>3/</sup> and licence which are normally required of export-enterprises in Korea.<sup>4/</sup>

(e) Labour

Enterprises are protected from labour disputes through the application of the regulations governing "Public Utilities" in the Labor Dispute Mediation Law controlling labour disputes. The Law provides for the temporary settlement of a dispute through the intercession of an appointed industrial arbitrator, followed by mediation. (In effect, no labour unions exist.)

(f) Role of zones' administration:

The authority vested in the Minister of the Economic Planning Board under the Foreign Capital Inducement Law has been delegated (to the Zones' Administration) with respect to capital to be induced by occupant-enterprises or supporting-enterprises. Consequently, the Deliberation of Foreign Capital Inducement Law is not applied by the Foreign Capital Inducement Deliberation Committee. Thus, for the simplification of procedures, the convenience of the occupant enterprises, and the administration of support services, all

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1/ Foreign Capital Investment Law. Article 14.

2/ Law of Local Taxes, Article 184, Para.2, and Article 110, Para.3.

3/ There is some doubt as to whether a permanent waiver of registration taxes exists or whether it is only for the first five years following registration (Law of Local Taxes, Article 128, Para.2).

4/ Ibid., Articles 2, 8 and 12.

necessary facilities have been established within the zones under the auspices of the Ministry of Trade and Industry. The Administration Office is empowered to grant the various permissions and approvals necessary to take up occupancy, to induce foreign investment and technology, to construct plants, and to conduct export and import activities and other related business activities. In addition to the Administration Office, the following agencies are stationed in the zones in order to simplify and expedite administrative services for occupant-enterprises:

- (i) Customs office
  - (ii) Post office
  - (iii) Immigration office
  - (iv) Labour department office
  - (v) Police station, fire station
  - (vi) Dispensary
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### MASAN EXPORT PROCESSING ZONE (MASAN EPZ)

#### 1. History

1970 January	Promulgation of the Free Export Zone List Establishment Law.
March	Designation of Section I of MAFEZ.
July	Acceptance of occupation applications commences.
1972 December	Designation of Section II of MAFEZ.

#### 2. Size

Section I	549,500 m <sup>2</sup>
Section II	264,500 m <sup>2</sup>
Total area	814,000 m <sup>2</sup>
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#### 3. Infrastructure

- Water supply : 10,000 - 20,000 tons per day
- Power supply : 20,000 kW
- Transport and communications: Two 20,000 tons class vessel wharfs.
  - Railroad Seoul-Masan (express): 5 hrs.
  - Pusan-Masan (express): 1 hr.
  - Expressway Seoul-Masan: 6 hrs.
  - Pusan-Masan: 1 hr.
  - Taegu-Masan: 2 hrs.
  - International Airport: 20 minutes.
- Standard Factory Building: 7 Blocks (1 Block = 11,550m<sup>2</sup>)
- Housing: Apartments for foreigners - fully occupied
- Land and Premises: All available land and all factory buildings fully occupied.



#### 4. Labour

- Operatives are mostly female; clerks and administrative workers are mostly male. Majority of females young (19-25 years) and unmarried but increasingly common for married women to be retained or newly engaged. Initially, women were compulsorily retired at 25 years but retirement age now often up to 28 years. In early '70s women workers were generally middle-school graduates but now are increasingly high-school graduates (up to 70 per cent).
- Training - up to 3 months - usually provided "on the job". A small number of workers are sent to Japan for more advanced training by some firms.
- Labour is recruited locally - no major difficulties at present.
- Buses operated by each company to bring in workers from Masan and surrounding districts.
- Dormitories provided by Zone Administration for workers from rural areas. Costs are subsidized by employer.
- Labour turnover is high in some factories - up to 4 per cent per month.
- There are no labour unions.
- The possibility exists in some factories for promotion of women operatives to supervisory roles.

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#### Iri Export Processing Zone (Iri EPZ)

##### 1. History

- 1973 October: Notice of Designation for the Zone.
- 1974 December: Establishment of Zone.
- 1975 February: Opening of Zone Administration Office.
- 1976 January: Part of the Iri EPZ diverted to the General Industrial Estate.
- June: Establishment of Iri Jewellery Export Industrial Estate.

##### 2. The Iri Industrial Estate is divided into:

- (i) The Free Export Zone      A Bonded area for export only.
- (ii) The General Industrial Estate      A zone for domestic investors. (But \$176,000 of foreign investment has come to the Estate.)
- (iii) The Jewellery Export Industrial Estate      A unique domestic industrial estate where many independent enterprises are assembled in one area, processing synthetic and natural gemstones and manufacturing various kinds of jewellery for export. (Primarily domestic capital, but \$182,000 foreign capital.)

3. Size  
( '000 m<sup>2</sup> )

	Total designated areas for factories	Public areas	Area available for lease	Unleased areas
The Free Export Zone	319	26	293	(a)
The General Industrial Estate	1,041	234	807	(a)
The Jewellery Export Industrial Estate	66	23	28	15
Total	1,426 (431 pyong) <sup>b/</sup>	283 (86 pyong)	1,128 (341 pyong)	15 (5 pyong)

a/ It is thought that some areas are still available for lease but statistics are unavailable.

b/ 1 pyong = 3.3 m<sup>2</sup>.

4. Infrastructure

- Water supply: 20,000 ton/day
- Power supply: 30,000 kW
- Transport and communications: The port of Kunsan is about 30 km distant. Kunsan can accommodate one vessel of 20,000 tons and two vessels of 10,000 tons simultaneously.
  - Railroad Seoul-Iri : 4 hrs.  
Taejon-Iri: 1 1/2 hrs.
  - Expressway Seoul-Iri : 3 1/3 hrs.  
Taejon-Iri: 1 1/2 hrs.  
(The Expressway between Seoul and Pusan (and elsewhere) can be reached near Chonju, about 20 km from Iri.)
- Standard factory building: 1 block
- Housing: Apartments and houses available for rent for foreigners.
- Land and premises: Land is currently available for rent (\$118.80 per acre = 2.936 cents/m<sup>2</sup>).

Sources: The Masan Free Export Zone. Administration Office, Masan, Free Export Zone (c. 1978).

Masan Free Export Zone: Facts and Figures on MAFEZ, Administration Office, Masan Free Export Zone, 1985.

Data on Iri Free Export Zone, Administration Office, Iri Free Export Zone, June 1986.

and personal discussions.

Tax Incentives for Foreign Investors in the Republic of Korea

Tax	Taxation basis	Tax rates	Tax reduction or exemption
Income Tax on Unincorporated Enterprises	Amount of income or earnings	6%-55%	Exemption for five years after the tax year beginning first following the registration in proportion to the ratio of stock or shares owned by foreign investors up to the income accruing from the business activities approved.
Corporation Tax	1. Business year 2. Income in liquidation	20%-33%	Same as above. Or, alternatively, a foreign invested enterprise may choose a special depreciation instead, which may be more favourable to capital-intensive enterprises.
Wages and Salary Income Tax	Foreign employees working in foreign invested enterprise, or under technology inducement contract	6%-55%	Exemption for 5 years
Dividend Income Tax	Amount of dividends received	25%	Exemption for 5 years after tax year beginning first following the registration of the foreign invested enterprise
Tax on Technology Income	Income from supplying technology (royalty)	25%	Exemption for 5 years
Interest Income	Gross receipt or derived from interest on loans or deposits	25%	Exemption for approved foreign loans
Customs Duty	Ad valorem basis (c.i.f. price)	5%-150%	Exemption for approved capital goods
Property Tax	Assessed value of land vessels, etc.	1. Land: 0.3%-0.6% 2. House & vessels: 0.3%-0.6%	Exemption for 5 years
Property Acquisition Tax	Acquisition price	1. 2% 2. 10% in Seoul & Pusan	Exemption

Source: Korea Chamber of Commerce and Industry, Industrial Estates in Korea, 1985, pp.9-11.

Statistical tables

Annex Table A-1. Industrial firms, employees, exports

Name		Firms		Employees		Exports	
		1983 <sup>a/</sup>	1984	1983 <sup>a/</sup>	1984	1983	1984
		Number		'000		\$ million	
EPZs:	Total	99	37.0	34.7	768	878.6	
	Masan	81	32.9	(33.9) <sup>b/</sup>	706		
	Iri	18	4.1	(4.0) <sup>b/</sup>	62		
<hr/>							
Direct-controlled							
Industrial Estates:	Total	1,464	230.8	258.1	2,976	6,089.2	
	Korea Export	403	89.1	101.2	686	2,787.2	
	Panwol	558	25.6	31.4	152	160.0	
	Iri	89	10.6	14.2	50	163.0	
	Yochon	37	5.3	5.3	985	618.3	
	Kumi	228	50.7	51.0	356	1,289.0	
	Changwon	134	43.9	45.8	376	519.0	
	Onsan	15	5.6	5.7	371	289.3	
	Ulsan	..	..	3.5	..	263.4	
<hr/>							
Local Industrial							
Estates:	Total	1,039	144.5	159.7	837	1,462.7	
	Inchon	39	32.8	..	143	..	
	Songnam	195	31.4	..	138	..	
	Chunchon	26	1.7	..	8	..	
	Wonju	20	1.4	..	15	..	
	Chongju	76	17.6	..	131	..	
	Taejon	86	11.9	..	69	..	
	Chonju	60	8.0	..	56	..	
	Kwangju	208	9.7	..	39	..	
	Mokpo	39	5.8	..	27	..	
	Taegu	86	8.4	..	25	..	
	Pohang	75	13.5	..	164	..	
	Nogong	68	1.4	..	17	..	
	Chonan	53	0.6	..	2	..	
	Chongup	8	0.3	..	3	..	
<hr/>							
Private Machinery							
Industrial Estates:	Total	112	7.6	8.5	23	69.5	
	Yongdungpo	60	2.6	..	8	..	
	Inchon	52	5.0	..	20	..	
<hr/>							
Total of above		2,714	419.0	461.0	4,609	8,500	
<hr/>							
Total Republic of Korea		..	14,515	14,417	23,204	26,335	
<hr/>							
Industrial estates as							
proportion of Republic	(Per cent)	..	2.9	3.2	19.9	32.3	
of Korea							
EPZs as proportion of	(Per cent)	3.6	8.8	7.5	16.7	10.3	
industrial estates							
EPZs as proportion of	(Per cent)	..	0.3	0.2	3.3	3.3	
Republic of Korea							

Sources: Korea Exchange Bank, Businessman's Guide to Korea, 1984, p.150 (based on Ministry of Finance data); Korea Chamber of Commerce and Industry, Industrial Estates in Korea, 1985, p.18; the Bank of Korea, Monthly Statistical Bulletin, Table 75; Masan and Iri EPZ Administration Offices.

<sup>a/</sup> The statistics appear to be for 1983 but they are not completely consistent with other sources. EPZ Administration figures show Masan, 31,000 and Iri, 3,700.

<sup>b/</sup> From the EPZ Administration Offices. The discrepancy between these and the total is obvious.

Annex Table A-2. Total and bonded processed exports, 1966-1986  
(\$'000 and per cent)

Year	Bonded processed								
	Total	Ordinary	Others	Masan + Iri EPZs					
				Total	Masan EPZ	Iri EPZ	As per cent of		
							Total	Total bonded processed	Total Exports
1966	250,334	215,848	5,763	28,750	n.a.	n.a.	n.a.	n.a.	n.a.
1967	320,229	259,557	10,884	49,788	n.a.	n.a.	n.a.	n.a.	n.a.
1968	455,400	356,320	12,115	86,965	n.a.	n.a.	n.a.	n.a.	n.a.
1969	622,516	478,930	12,919	130,667	n.a.	n.a.	n.a.	n.a.	n.a.
1970	835,185	659,850	23,062	152,273	n.a.	n.a.	n.a.	n.a.	n.a.
1971	1,067,607	839,162	19,643	208,802	856	n.a.	856	0.4	..
1972	1,624,088	1,308,867	29,893	285,328	9,739	n.a.	9,739	3.4	0.6
1973	3,225,025	2,459,112	62,797	703,116	70,374	n.a.	70,374	10.1	2.2
1974	4,460,370	3,334,027	61,504	1,064,839	181,547	n.a.	181,547	17.0	4.1
1975	5,081,016	3,899,698	79,777	1,101,541	174,803	171	174,974	15.9	3.4
1976	7,715,343	5,960,798	176,434	1,578,111	303,000	5,255	308,255	19.5	4.0
1977	10,046,457	8,041,698	243,783	1,760,976	366,000	16,000	382,000	21.7	3.8
1978	12,710,642	10,794,077	307,599	1,608,966	454,000	27,000	481,000	29.9	3.8
1979	15,055,453	13,125,695	486,989	1,441,769	552,000	32,000	584,000	40.5	3.9
1980	17,504,862	15,490,631	384,151	1,630,080	587,000	42,000	129,000	38.6	3.6
1981	21,253,757	18,276,409	425,209	2,552,140	658,364	69,292	727,656	28.5	3.4
1982	21,853,394	17,404,982	359,814	4,089,598	568,154	52,765	620,919	15.2	2.8
1983	24,445,054	19,920,153	362,501	4,162,400	649,204	53,776	702,980	16.9	2.9
1984	29,244,861	23,579,231	503,233	5,162,397	819,818	138,051	957,869	18.6	3.3
1985	30,283,000	23,645,000	677,000	5,961,000	748,284	82,537	830,821	13.9	2.7
1986	16,404,000	..	..	..	416,301	44,103	460,404	..	2.8

Sources: Statistical Yearbook of Foreign Trade, 1984, Office of Customs Administration.  
Customs Policy Division of Ministry of Finance.  
Ministry of Trade and Industry.

Note: Break in series as different sources were used (discrepancies between series are not large).

Annex Table A-3. Foreign direct investment by country and industry in the Republic of Korea<sup>a/</sup> and in Masan EPZ<sup>b/</sup>  
\$ million and per cent

Sector <sup>c/</sup>	Japan investment in				USA investment in				Other investment in				Total investment in			
	ROK		Masan EPZ		ROK		Masan EPZ		ROK		Masan EPZ		ROK		Masan EPZ	
	\$ million	Per cent	\$ million	Per cent	\$ million	Per cent	\$ million	Per cent	\$ million	Per cent	\$ million	Per cent	\$ million	Per cent	\$ million	Per cent
Electric and electronics	133.6	9.7	71.3	64.9	211.1	27.4	1.9	33.9	41.5	8.1	2.9	90.6	386.2	14.5	76.1	64.2
Machinery <sup>d/</sup>	103.8	7.6	15.0	13.7	157.5	20.4	0.4	7.1	16.2	3.2	-	-	277.5	10.5	15.4	13.0
Metals	50.9	3.7	15.1	13.8	8.0	1.0	0.6	10.7	13.7	2.7	-	-	72.6	2.7	15.7	13.2
Textiles and garments	65.9	4.8	1.1	1.0	0.8	0.1	-	-	5.9	1.2	0.3	9.4	72.5	2.7	1.4	1.2
Others	1,016.4	74.2	7.3	6.6	394.1	51.1	2.7	48.2	435.5	84.9	-	-	1,846.2	69.5	10.0	8.4
<b>Total</b>	<b>1,370.6</b>	<b>100.0</b>	<b>109.8</b>	<b>100.0</b>	<b>771.5</b>	<b>100.0</b>	<b>5.6</b>	<b>100.0</b>	<b>512.8</b>	<b>100.0</b>	<b>3.2</b>	<b>100.0</b>	<b>2,655.0</b>	<b>100.0</b>	<b>118.6</b>	<b>100.0</b>
<b>Per cent of total:</b>																
Republic of Korea	51.6				29.1				19.3				100.0			
Masan EPZ			92.6				4.7				2.7				100.0	

Sources: Republic of Korea: Ministry of Finance, Investment Guide to Korea 1986, Appendix 2, Table II, p.99.

a/ Cumulative investments, 1962-1985.

b/ As at 30 June 1986 [Statistics available only for Masan EPZ; Iri statistics are not broken down by both industry and country].

c/ Only the four sectors listed can be compared between "Republic of Korea" and "Masan EPZ".

d/ Appears as "machinery" in Republic of Korea statistics and hence assumed to include "machinery" and "precision machinery" listed in Masan EPZ statistics which, consequently, have been combined.

Masan EPZ: Administration Office.

**Annex Table A-4. Foreign investment in Masan and Iri EPZs in relation to total foreign direct investment in Republic of Korea<sup>a/</sup>**

Year	Foreign Investment in			Foreign direct investment in Rep. of Korea \$'000	Masan and Iri EPZs as Proportion of foreign direct investment in Rep. of Korea Per cent
	Masan EPZ \$'000	Iri EPZ \$'000	Masan EPZ plus Iri EPZ \$'000		
1971	3,633	n.a.	3,633	25,793	14.1
1972	30,050	n.a.	30,050	93,072	32.3
1973	43,866	n.a.	43,866	156,606	28.0
1974	3,387	n.a.	3,387	74,003	4.6
1975	639	2,788	3,427	169,398	2.0
1976	9,603	957	10,560	72,160	14.6
1977	2,059	5,543	7,602	65,915	11.5
1978	3,894	-4,207	-313	128,438	-0.1
1979	4,204	-1,090	3,114	107,312	2.9
1980	-8,434	-382	-8,816	140,751	-6.3
1981	-6,996	1,867	-5,129	145,327	-3.5
1982	-3,251	855	-2,396	187,791	-1.3
1983	1,923	209	2,132	267,753	0.8
1984	1,285	585	1,870	419,049	0.4
1985	-1,228	-1,798	-3,026	531,720	-0.6
1986 <sup>b/</sup>	6,888	0	6,888	..	..

**Sources:** Masan and Iri EPZ Administration Offices and derived from Ministry of Finance, Investment Guide to Korea 1986, Appendix 2, p. 97 (Note: Earlier editions of the Guide refer to the statistics as representing "Foreign Investment Approval"; the 1986 edition, however, titles the series "Foreign Investment by Year".)

**a/** For note on foreign direct investment see note (b) to Table 8.

**b/** Up to May 1986.

Annex Table A-5. Masan EPZ: Exports by country of destination, 1978 to 1986 (selected years)

	1978		1980		1982		1984		1985		1986(first half)	
	\$ '000	Per cent	\$ '000	Per cent	\$ '000	Per cent	\$ '000	Per cent	\$ '000	Per cent	\$ '000	Per cent
Japan	145.6	35.0	203.6	37.8	214.9	43.9	411.2	55.7	391.0	56.0	188.3	49.7
USA	207.4	49.8	170.4	31.7	156.9	32.1	230.7	31.2	206.1	29.5	131.6	34.8
Canada	17.1	4.1	19.0	3.5	19.6	4.0	20.3	2.7	22.1	3.2	10.9	2.9
Hong Kong	6.9	1.7	56.5	10.5	40.1	8.2	26.2	3.5	20.3	2.9	12.1	3.2
Fed.Rep. of Germany	6.8	1.6	13.4	2.5	9.2	1.9	9.0	1.2	12.3	1.8	9.8	2.6
Netherlands	6.3	1.5	13.8	2.6	3.8	0.8	2.2	0.3	3.3	0.5	1.7	0.4
Panama	4.9	1.2	9.7	1.8	5.5	1.1	1.0	0.1	1.3	0.2	0.5	0.1
Great Britain	2.7	0.6	5.9	1.1	9.4	1.9	4.2	0.6	7.8	1.1	3.9	1.0
Italy	2.2	0.5	3.2	0.6	1.6	0.3	1.8	0.2	1.9	0.3	1.4	0.4
Singapore	1.4	0.3	4.9	0.9	2.2	0.4	4.0	0.5	3.2	0.5	3.1	0.8
Others	14.9	3.6	37.8	7.0	25.9	5.3	27.7	3.8	29.6	4.2	15.2	4.0
<b>TOTAL<sup>a/</sup></b>	<b>416.1</b>	<b>100.0</b>	<b>538.2</b>	<b>100.0</b>	<b>489.2</b>	<b>100.0</b>	<b>738.4</b>	<b>100.0</b>	<b>698.8</b>	<b>100.0</b>	<b>378.5</b>	<b>100.0</b>

Source: Masan EPZ Administration Office.

a/ The totals are different from figures quoted elsewhere in this report as they exclude sales to other EPZ firms. Cf. on this issue section IV.3 of this report.



Annex Table A-6. Masan EPZ: Exports, net foreign exchange earnings,  
factor and non-factor inputs, 1971-1985

\$ million and percent

Exports	Net foreign exchange earnings					Net foreign exchange earnings as proportion of exports (6)/(1)	Total raw materials used (8)	Domestic raw materials as proportion of total raw materials (2)/(8)	
	Domestic materials used (2)	Wages (3)	Rent (4)	Services (5)	Total (6)				
(1)	(2)	(3)	(4)	(5)	(6)	Per cent (7)		Per cent (9)	
1971	0.9	0.02	0.16	0.02	0.05	0.2	22.2	0.6	3.3
1972	9.7	0.4	1.4	0.2	1.0	3.0	30.9	6.7	6.0
1973	70.4	11.2	8.4	0.7	5.6	25.9	36.8	48.6	23.0
1974	181.5	27.6	18.1	1.1	23.4	70.1	38.6	125.2	22.0
1975	174.8	30.3	20.8	1.0	19.9	72.0	41.2	124.1	24.4
1976	303.0	63.7	30.0	1.1	54.3	149.1	49.2	212.5	30.0
1977	367.9	88.9	40.1	1.4	50.6	180.9	49.2	266.2	33.4
1978	484.8	108.8	49.9	1.5	91.0	251.2	51.8	350.1	31.1
1979	600.6	144.3	65.5	1.7	99.5	311.0	51.8	427.3	33.8
1980	628.1	142.9	56.7	1.9	131.6	333.0	53.0	432.5	33.0
1981	696.3	150.9	58.4	2.1	160.2	371.6	53.4	461.0	32.7
1982	601.3	142.7	61.0	2.1	118.8	324.5	54.0	398.4	35.8
1983	706.5	155.6	67.8	2.2	148.2	373.7	52.9	473.0	32.9
1984	878.6	191.4	80.0	2.1	170.5	444.0	50.5	623.9	30.7
1985	809.3	183.3	79.6	2.0	147.8	412.6	51.0	550.7	33.3

(continued)

Annex Table A-6 (continued)  
(\$ million and per cent)

Wages+rent + services + raw materials (3)+(4)+ (5)+(8)	Profit= (1)-(10)	Value added = wages + rent+profit (3)+(4)+(11)	Value added as propor- tion of ex- ports (= gross output) (12)/(1)	Non-factor inputs (5+8)	Gross output = value of exports (12)+(14)	Profit as Proportion of value added (11)/(12)	Wages as proportion of value added (3)/(12)	Profit as proportion of turn- over (= exports) (11)/(1)	
(10)	(11)	(12)	Per cent (13)	(14)	(15)	Per cent (16)	Per cent (17)	Per cent (18)	
1971	0.9	-	0.2	22.2	0.7	0.9	-	80.0	-
1972	9.3	0.4	2.0	20.6	7.7	9.7	0.2	70.0	4.1
1973	63.3	7.1	16.2	23.0	54.2	70.4	43.8	51.9	10.1
1974	167.8	13.7	32.9	18.1	148.6	181.5	41.6	55.0	7.5
1975	165.8	9.0	30.8	17.6	144.0	174.8	29.2	67.5	5.1
1976	297.9	5.1	36.2	11.9	266.8	303.0	14.1	82.9	1.7
1977	358.3	9.6	51.1	13.9	316.8	367.9	18.8	78.5	2.6
1978	492.5	-7.7	43.7	9.0	441.1	484.8	-17.6	114.2	-15.9
1979	594.0	6.6	73.8	12.3	526.8	600.6	8.9	88.8	1.1
1980	622.7	5.4	64.0	10.2	564.1	628.1	8.4	88.6	0.9
1981	681.7	14.6	75.1	10.8	621.2	696.3	19.4	77.8	2.1
1982	580.3	21.0	84.1	14.0	517.2	601.3	25.0	72.5	3.5
1983	691.2	15.3	85.3	12.1	621.2	706.5	17.9	79.5	2.2
1984	876.5	2.1	84.2	9.6	794.4	878.6	2.5	95.0	0.24
1985	780.1	29.2	110.8	13.7	698.5	809.3	26.4	71.8	3.6

Sources: Primarily based on statistics provided by Masan EP2 Administration Office and MTI.

Annex Table A-7. Republic of Korea: Estimation of profitability of  
foreign direct investment, 1978-1984  
(\$ million and per cent)

	Cumulative arrivals	Cumulative withdrawals	Remaining balance (1) - (2)	Gross direct investment income pay- able abroad	Estimated royalties payable abroad	Total payments abroad on foreign direct investment (4) + (5)	Profit ratio (6)/(3) (7) per cent
	(1)	(2)	(3) \$ million	(4)	(5)	(6)	
1978	855.3	46.3	809.0	58.5	29.4	87.9	10.9
1979	962.6	133.1	829.5	48.8	24.6	73.4	8.8
1980	1,103.3	229.8	873.5	62.7	31.5	94.2	10.8
1981	1,248.7	239.7	1,009.0	76.6	38.5	115.1	10.1
1982	1,436.4	239.7 <sup>a/</sup>	1,196.7	66.0	33.2	99.2	8.3
1983	1,704.2	239.7 <sup>a/</sup>	1,464.5	94.5	47.6	142.1	9.7
1984	2,123.2	239.7 <sup>a/</sup>	1,883.5	85.3	42.9	128.2	6.8

<sup>a/</sup> Assumes cumulative figure remains constant at 1981 level i.e. there are no further capital withdrawals; no reasonably based trend could be established. To the extent that this assumption understates withdrawals, the profits ratios shown in column (7) for 1982-1984 will be lower than the actual.

**Sources and method:**

**Arrivals:** Ministry of Finance, Investment Guide to Korea 1986, Appendix 2, Table 1, p.97. These statistics are rather different from those quoted by Bohn Young Koo, "Direct Foreign Investment in Korea" (in Galenson W. (Ed.) Foreign Trade and Investment.....), presumably because of official revisions.

**Withdrawals:** Based on Bohn Young Koo, op.cit., Table 4.8, p.192, modified to take account of differences in Arrivals figures.

**Gross direct investment income payable abroad:** IMF Balance of Payments Statistics Yearbook 1985, vol. 36, part 1., p.346. The statistics are generally some 25 per cent greater than those quoted by Bohn Young Koo for "Profit Remittance". SDRs converted to US \$ on the basis of SDR/\$ rate in IMF, International Financial Statistics.

**Royalties:** The ratio of "Royalties" to "Profit Remittance" as derived from Bohn Young Koo was used to estimate this statistic; in the absence of further information it has been assumed that the ratio of royalties to total payments abroad remains constant.

Annex Table A-8. Relationship between profitability in Masan EPZ and all Republic of Korea foreign investment, 1971-1984  
(\$ million and per cent)

	Masan EPZ		Ratio of profits to		Ratio of Masan EPZ profits rate to Rep. of Korea profits rate
	Total investment <sup>a/</sup>	Profits <sup>b/</sup>	Total investment Masan EPZ	Total direct foreign investment Rep. of Korea <sup>c/</sup>	
	\$ million			per cent	
1971	5.3	0	-	12.2	-
1972	36.9	0.4	1.1	7.6	14.5
1973	82.8	7.1	8.6	9.1	94.5
1974	88.9	13.7	15.4	8.6	179.1
1975	89.0	9.0	10.1	7.1	142.3
1976	98.0	5.1	5.2	8.8	59.1
1977	103.9	9.6	9.2	11.5	80.0
1978	111.9	-7.7	-6.7	9.2	-
1978				10.9	-
1979	115.0	6.6	5.7	8.8	64.8
1980	112.9	5.4	4.8	10.8	44.9
1981	117.2	14.6	12.5	10.1	123.8
1982	116.2	21.0	18.1	8.3	218.1
1983	118.2	15.3	12.9	9.7	133.0
1984	128.2	2.1	1.6	6.8	23.5
1985	125.9	29.2	23.2	..	..

Sources: Masan EPZ: Tables 8 and Annex Table A-6.  
Republic of Korea 1971-1978: Bohn Young Koo, "The role of direct foreign investment in Korea's Recent Economic Growth", Table 4.8, p.192, in Galenson, W. (Ed.) Foreign Trade and Investment: Economic Development in the Newly Industrializing Asian Countries Madison, 1985.

Republic of Korea 1978-1984: Calculated in Annex Table A-7. Note the break in the series in 1978.

a/ Includes foreign and domestic.

b/ Implicitly includes royalties.

c/ Explicitly includes royalties in definition of profits.

Annex Table A-9. Number of employees: Masan and Iri EPZs and Republic of Korea, 1971-86  
(<sup>'000</sup> and per cent)

	Masan EPZ			Iri EPZ			Masan EPZ + Iri EPZ			Republic of Korea		Masan + Iri EPZs as proportion Republic of Korea	
	Male	Female	Total	Male	Female	Total	Male	Female	Total	All industries	Manufacturing	All industries	Manufacturing
										Total	Total		Per cent
1971	0.1	1.1	1.2	n.a.	n.a.	n.a.	0.1	1.1	1.2	10,066	1,336	0.01	0.09
1972	1.1	6.1	7.1	n.a.	n.a.	n.a.	1.1	6.1	7.1	10,559	1,445	0.07	0.49
1973	4.0	17.3	21.2	n.a.	n.a.	n.a.	4.0	17.3	21.2	11,139	1,774	0.19	1.20
1974	5.6	15.2	20.8	n.a.	n.a.	n.a.	5.6	15.2	20.8	11,586	2,012	0.18	1.03
1975	5.6	17.0	22.6	..	..	0.3	5.6	17.0 <sup>b/</sup>	22.9	11,830	2,205	0.19	1.04
1976	7.2	22.8	30.0	..	..	1.2	7.2	22.8 <sup>b/</sup>	31.2	12,556	2,678	0.25	1.17
1977	7.8	22.9	30.7	..	..	2.3	7.8	22.9 <sup>b/</sup>	33.0	12,929	2,798	0.26	1.18
1978	7.7	23.3	31.0	..	..	3.0	7.7	23.3 <sup>b/</sup>	34.0	13,490	3,016	0.25	1.13
1979	7.9	23.3	31.2	..	..	2.8	7.9	23.3 <sup>b/</sup>	34.0	13,664	3,126	0.25	1.09
1980	6.3	22.2	28.5	0.7	2.0	2.7	7.0	24.2	31.2	13,706	2,972	0.23	1.05
1981	6.2	21.8	28.0	0.9	2.6	3.5	7.1	24.4	31.5	14,048	2,872	0.22	1.10
1982	6.0	20.0	26.0	1.0	2.6	3.6	7.0	22.6	29.6	14,424	3,047	0.21	0.97
1983	6.5	24.5	31.0	1.0	2.7	3.7	7.5	27.2	34.7	14,515	3,275	0.24	1.06
1984	7.2	26.7	33.9	1.0	2.9	4.0	8.2	29.6	37.9	14,417	3,350	0.26	1.13
1985	6.6	22.3	29.0	0.9	2.9	3.8	7.5	25.2	32.8	14,935	3,500	0.22	0.94
1986a/	7.0	24.7	31.7	1.0	3.4	4.4	8.0	28.1	36.1	..	..	..	..

Sources: Masan and Iri EPZs: Administration offices and MTI.  
Republic of Korea: Bank of Korea, Economic Statistics Yearbooks 1983, Tables 144 and 145 and 1985, Tables 121 and 122, and Monthly Statistical Bulletin.

a/ Masan EPZ, 30 June 1986; Iri EPZ, 30 April 1986. (The total for 30 June 1986 is 4,288.)

b/ Masan EPZ only.

Annex Table A-10. Sex distribution of employment: Masan and Iri EPZs and Republic of Korea, 1971-1985

	Masan EPZ		Iri EPZ		Republic of Korea	
	Male	Female	Male per cent	Female	Male	Female
1971	10.3	89.7	n.a.	n.a.		
1972	14.8	85.2	n.a.	n.a.		
1973	18.7	81.3	n.a.	n.a.		
1974	27.0	73.0	n.a.	n.a.		
1975	24.6	75.4		..	63.3	36.7
1976	23.9	76.1	..	..	61.6	38.4
1977	25.4	74.6	..	..	62.9	37.1
1978	24.7	75.3	..	..	61.9	38.1
1979	25.3	74.7	..	..	61.5	38.5
1980	22.3	77.7	25.4	74.6	61.7	38.3
1981	22.2	77.8	25.5	74.5	61.8	38.2
1982	23.0	77.0	26.8	73.2	60.9	39.1
1983	21.0	79.0	26.9	73.1	60.7	39.3
1984	21.2	78.8	25.7	74.3	61.5	38.5
1985	22.9	77.1	23.6	76.4	61.0	39.0

Sources: Masan and Iri EPZs: Administration Offices.  
 Republic of Korea: Bank of Korea, Economic Statistics Yearbook 1985, Table 122, p.238 and Monthly Statistical Bulletin. (The statistics refer to total employment; distribution by sex for manufacturing industry alone is not available.)

Annex Table A-11. Wages in Masan EPZ and in Korea's manufacturing sector, 1971-1986

	Total Masan employment	Total Masan wage cost (\$ '000)	Average annual wage per person employed		Masan EPZ annual wage as proportion of Republic of Korea manufacturing annual wage (per cent) (3)/(4)
			Masan EPZ (\$)	Korea manufacturing (\$)	
	(1)	(2)	(3)	(4)	(3)/(4)
1971	1,248	157	(126) <sub>c/</sub>	560	..
1972	7,106	1,395	(196) <sub>c/</sub>	569	..
1973	21,240	8,420	(396) <sub>c/</sub>	674	..
1974	20,822	18,090	869	749	116.0
1975	22,586	20,772	920	952	96.6
1976	29,953	30,035	1,003	1,281	78.3
1977	30,719	40,083	1,305	1,715	76.1
1978	30,960	49,851	1,610	2,303	69.9
1979	31,153	65,521	2,103	2,963	71.0
1980	28,532	56,732	1,988	2,667	74.5
1981	28,016	58,377	2,084	3,018	69.1
1982	26,012	60,991	2,345	3,239	72.4
1983	30,989	67,847	2,189	3,421	64.0
1984	33,858	80,049	2,364	3,557	66.5
1985	28,983	79,582	2,746	3,635	75.5
1986 June	31,666	94,124 <sub>b/</sub>	2,972	..	..

Sources: Masan employment and total wage cost: Administration Office. Masan EPZ. Republic of Korea manufacturing: EPB, Major statistics of Korea Economy 1986, Table 11-12a, p.277 (Won figures converted to \$ on basis of exchange rates in: EPB, ibid, Table 12-13a, p.307. (The 1971 wage was estimated.)

a/ "Wages" should be interpreted as "Earnings" - but only in the Bank of Korea, Monthly Statistical Bulletin is the correct term explicitly used.

b/ On annual basis, from June 1986 statistic.

c/ The figures in brackets are suspect. They appear to be far too low. The defective statistic is probably due to the fact that as the employment figure is building up over the years the "total wage cost" does not represent wages for a whole year per person employed.

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