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**SCOPE, STRUCTURE AND DETERMINANTS OF LINKAGES BETWEEN EXPORT PROCESSING ZONE
FIRMS AND THE DOMESTIC ECONOMY IN THE REPUBLIC OF KOREA***

Prepared by
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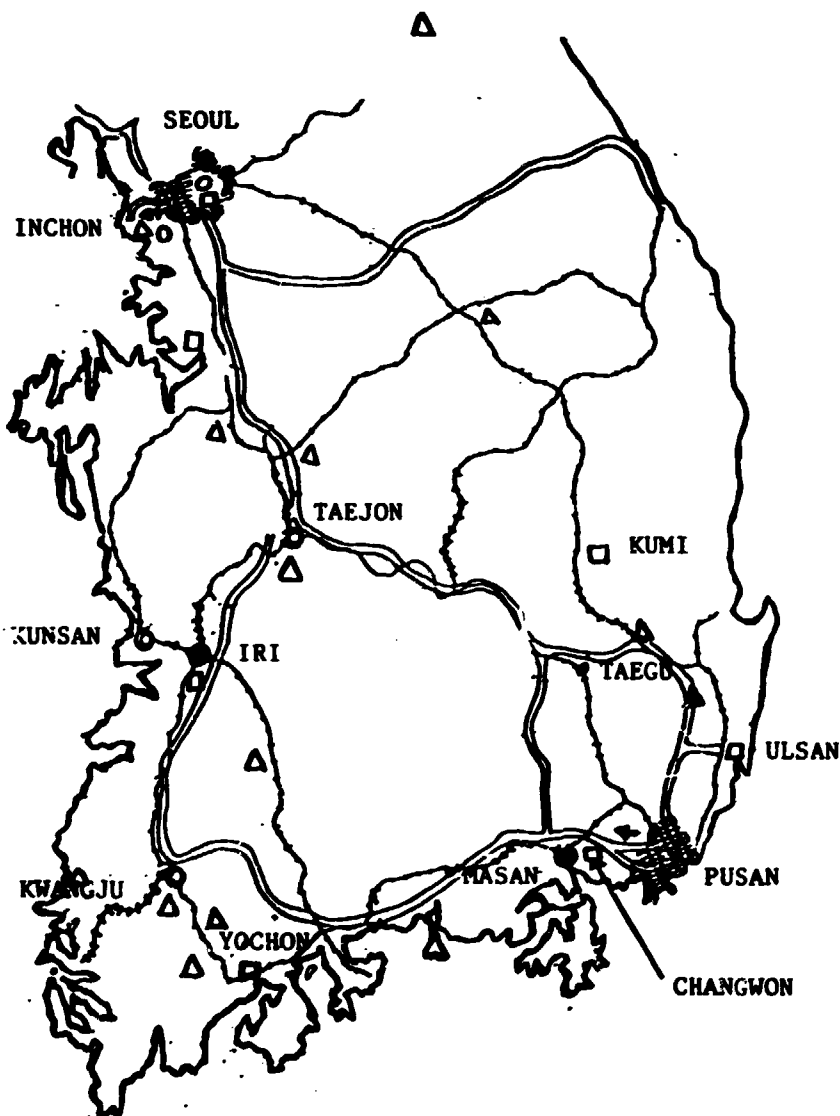
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Two dots (..) indicate that data are not available or are not separately listed.

A dash (-) indicates that the amount is nil or negligible.

n.a. = not applicable.

The following abbreviations are used:

EPB	Economic Planning Board (of Republic of Korea)
EPZ	Export Processing Zone
IBRD	International Bank for Reconstruction and Development
ILO	International Labor Office
IMF	International Monetary Fund
JV	Joint Venture
KTA	Korean Traders' Association
MTI	Ministry of Trade and Industry (of the Republic of Korea)
OECD	Organization for Economic Cooperation and Development
ROK	Republic of Korea
UNIDO	United Nations Industrial Development Organization

Foreword^{1/}

The role played by export-processing zones (EPZs)^{2/} in promoting industrialization in developing countries has long been a controversially discussed topic. Experience gained in many countries, in particular in the East and Southeast Asian region, has shown that these special economic zones can, on the one hand, contribute substantially to the generation and/or promotion of manufactured exports and to the provision of productive employment opportunities. On the other hand, they have in the past more often than not been characterized by one-sided sectoral structures of production, by a relatively high share of footloose and thus vulnerable investments and by a lack of backward linkages with the domestic economy.

The Republic of Korea was among the first developing countries to embark on this specific institutional approach to attract foreign export-oriented direct investment (Masan EPZ established 1971; Iri EPZ established 1975). This means that the country's EPZs have already gone through the infancy stage of their life cycle^{3/} and have reached a certain saturation point. A review of their present achievements thus may provide valuable information and insights with a view to designing policy measures both in the Republic of Korea and in other developing countries that would enhance the longer-term spin-offs and the catalytic role of EPZs for overall industrial development.

In this study an attempt has been made to focus on one particular aspect of the potential long-term development impact of EPZs, i.e. on their actual and potential backward linkages with domestic industrial enterprises. It is noteworthy that the Republic of Korea's Masan EPZ has been among the most

1/ This foreword draws heavily on an outline of the study prepared by Wilfried Luetkenhorst.

2/ In this study the term EPZs will be used as it is the more generic internationally-used term even though in the Republic of Korea the actual term used is "Free Export Zone".

3/ On the life-cycle concept of EPZs cf. A. Basile and D. Germidis, Investing in Free Export Processing Zones, OECD, Paris 1984, especially Chapter VII.

successful in this respect. The study considers the extent to which such linkages have been established through local preconditions and/or specific policy measures. Some case studies of companies operating within the EPZs attempt to flesh out this issue.

In a final section the study considers the future role and functions of the EPZs in the Republic of Korea. Evidence suggests that inflows of foreign investment have lost much of their momentum.^{4/} Partly in response to this the government has recently permitted 100 per cent local ownership of EPZ firms. Some options for the policy-makers are considered: one might be the gradual phasing out of EPZs through their absorption into the domestic economy; another might be their transformation into "science parks". Depending on which approach is adopted, EPZs in the Republic of Korea could either become "a relic of the past" or "a mechanism of the future".^{5/}

-
- 4/ Some in the Republic of Korea would argue that this necessarily follows the virtual complete physical occupation of the Zones but, of course, this is not an economic concept and prejudices the whole issue of capital intensification.
- 5/ L.B. Krause, Introduction to Galenson, W. (Ed.) Foreign Trade and Investment: Economic Development in the Newly Industrializing Asian Countries.

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Note: The names of officials met within companies in Masan and Iri EPZ's
have not been quoted so as to preserve confidentiality.

I. ECONOMIC BACKGROUND TO THE ESTABLISHMENT OF EPZs

Through the utilization of its skilled labour resources for the production of exports the Republic of Korea in the 1960s was able to overcome the problems of lack of natural resources and a small domestic market. The gross domestic product expanded by two-and-one-half times in real terms between 1960 and 1970 and more than doubled again in the next decade. Over the whole period 1960 to 1985 real GDP grew by 680 per cent, a growth rate of 8.5 per cent per annum. In constant per head terms, GDP grew at 6.4 per cent per annum. (IMF, 1984 pp.376/7 and EFB, 1986 Table 1-1a). By 1985 per capita income had reached \$2,032 - a far cry from the less than \$80 of 1960. And by 1986 it will probably reach \$2,200, putting the Republic of Korea firmly into the ranks of the middle-income countries.

During the same period exports experienced such a phenomenal growth that index number terminology becomes almost incomprehensible. If 1980 is taken as the base, the index number for the volume of exports in 1963 was 2; for 1985 it was 181. Perhaps more understandable is the fact that exports as a proportion of GNP rose from 1 per cent in 1960 to 9 per cent in 1970, 24 per cent in 1975 and to 33 per cent in 1985. The share of manufacturing (and mining, but this is negligible) in GDP rose from 9 per cent in 1960 to 22 per cent in 1970, 27 per cent in 1975 and 30 per cent in 1985. Compared with other developing countries, again the Republic of Korea stands out; whilst the average rate of growth of exports from low and middle income countries between 1960 and 1970 was around 5 per cent per annum, the Republic of Korea's growth rate was 35 per cent (Yuji Kubo et al., p.18).

As Balassa describes this era:

"The period of rapid growth was one of structural change in (the country), transforming a backward, primary-product-based economy into a newly industrializing developing country. The transformation occurred following the adoption of an outward-oriented development strategy, which permitted the exploitation of comparative advantage in international trade and contributed to rapid increases in productivity". (Balassa, 1985, p.142).

It should not be forgotten, however, that the rapid export expansion phase was preceded by a period of import substitution. Only when the benefits

We can note at this stage that the first of these listed incentives, and possibly the most important - tariff exemptions on imports of raw materials and spare parts - is the sine qua non of EPZs. This incentive to export operated generally for the Republic of Korea from 1959 to 1975 in the form of tariff exemptions as imports for export production cleared customs. From 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, 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 domestic and imported use of that input. Thus if an individual producer used relatively more of domestic input than the industry he would be overcompensated; this is an effective way of stimulating the use of domestic inputs.

Masan EPZ began operations in 1971 and Iri EPZ in 1975; 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.)

It must be remembered also that tariff exemptions were (and are) granted to firms producing for export in bonded factories located within general industrial estates or, indeed, anywhere in the Republic of Korea.^{6/} (See Appendix A for a note on industrial estates, which were initiated in the early sixties, and Appendix Table 6 for statistics on bonded exports.)

6/ It may be noted too 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, 1986, pp.22-23.)

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.

The free trade regime applying to exports prior to the establishment of the EPZs 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"^{1/} (Author's emphasis). (Balassa, 1985, p.149.)

Given the success of the export policy why did the Republic of Korea turn its attention towards the establishment of EPZs? What did they offer which had not been previously available generally? The answer seems to be that it was the necessity to attract private direct investment to sustain the export momentum which loomed large in the policy-makers minds. For if we look back to the end of the '60s we find that there was developing the view that the early export successes were not going 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 labor was cheaper". (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 greater capital intensivity process of development, was coupled with a growing necessity to devote capital resources to the defence industry through reduced U.S. assistance (After the establishment of Masan EPZ in 1971 came the first oil price increase at the end of 1983 which served to reinforce the capital-demanding policy shifts noted above since an ambitious nuclear power

^{1/} c.f. "to increase the foreign earning rate, the government implemented the system of listing domestically available items, and treated them as export items if found domestically produceable through screening. Thus, the number of such items increased from 9 to 32." EPB, Economic Survey of the 1972 Korean Economy, p.140.

programm was then launched. The objective is to provide 40 per cent of installed power capacity from nuclear sources by 1991 when thirteen nuclear power plants will be in operation).

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 (EPB, Major Statistics..... p.5) but the demands about to be made on domestic (and foreign institutional) savings were now becoming so large as to warrant the tapping of a new source.

Direct equity financing can be made by foreigners in two ways: by Direct Foreign Investment (DFI) and by the purchase of stock, i.e. Portfolio Foreign Investment (PFI). But in the case of the Republic of Korea these methods of capital inflow have never been used extensively. For instance, DFI has rarely amounted to more than 10 per cent of annual capital inflow and has, in fact, been frequently less than 5 per cent. PFI was small until the early 1980s^{8/} when foreigners were permitted to purchase Republic of Korea stocks through mutual funds (the process is being liberalized in 1986). One area which DFI could be attracted to was export production in the EPZs; inflows here would alleviate pressures on capital resources.

In 1970 there were only 11 EPZs in the world; by 1981 there were 96. Between 1971 (Masan's operating date) and 1975 23 zones were established in 11 countries, mainly Asian (9 in Malaysia, 2 in Taiwan Province of China, 2 in the Republic of Korea and 1 in India). [Basile and Germidis, OECD, 1984, pp.21-22.] It is highly likely, therefore, that the initiation of the system

8/ Over the whole period 1965-1974 direct investment constituted 12.7 per cent of the total of net borrowing plus direct investment i.e. it would have been even smaller if the concept of gross borrowing had been used. (calculated from Krueger, 1979, Table 41, p.147). From this table one can also observe that the debt service ratio (capital and interest repayments as a proportion of exports) reached a peak of 31.4 per cent in 1970 compared with only 5.7 per cent in 1965. Hence the growing concern about the foreign exchange situation mentioned in the text and which, it is maintained, was partly responsible for the inauguration of the Export Processing Zones concept.

of EPZs in a world context stimulated many countries to initiate their own EPZs 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. Clearly, in this scenario, the absence of incentives will affect international capital's decision on location: this conclusion is at variance with the often quoted view that "incentives do not materially affect the decision to invest". Yet it is a reasonable conjecture that "increases in incentives are more likely to be matched by other countries than are decreases" (see the discussion of this issue in Guisinger and Associates, 1985, pp.37-40). If the Republic of Korea had not instituted its system of EPZs in 1971 it might well have failed to attract some of the Japanese and American capital that, in the event, came its way; some part, instead, might have gone to the Republic of Korea's N.I.C. (newly-industrializing-countries) competitors of Taiwan Province of China, Hong Kong and Singapore. But it is in the nature of such counterfactual propositions that we can never be sure of the alternative outcome. We can never be sure of how much of the direct foreign investment which flowed into the Republic of Korea's EPZs would have flowed into the Republic of Korea in any case - in the absence of the EPZs. What we can be reasonably certain of is that it is not the incentives alone which induce foreign capital; they will be scrutinized by a potential foreign investor only after the major reasons for specific location have been determined - and these reasons will inevitably include political reasons of stability etc.

To conclude this introduction: by no stretch of the imagination can it be claimed that the establishment of the EPZs by the Republic of Korea was essential for the initiation of an export-oriented growth strategy - by the time Masan EPZ came into being in 1971 the Republic of Korea had experienced a decade of vigorous growth in GNP and exports. Two reasons for the establishment of the EPZs thus remain: (i) to help maintain the rate of growth

of exports^{9/} with their proven stimulatory effect on the growth of the economy 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 competitor nations themselves engaged in establishing EPZs.

^{9/} It might be added that in the late '60s growing uneasiness was being experienced about the servicing of external debt - a factor which enhanced the importance of exports (Krueger, 1979, p.119).

II. GENERAL ANALYSIS OF EPZ PERFORMANCE

II.1 Role and objectives of the EPZs in the Republic of Korea's overall industrial policy approach.

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 of which the following are some:

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 credit 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 designed to be part of a package of new measures designed to stimulate exports. Interestingly enough, the comment on their establishment appears not under the rubric, "to strengthen competitive power of export industries and to increase foreign exchange earnings" but under "to modernize production facilities and to facilitate mass production". Moreover, 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)^{10/} - the clear implication 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:

Act: "Authorizations or approvals shall be as follows;

- Projects which greatly contribute to the improvement of the balance of payments.
- Priority shall be given to those projects which will greatly contribute to the improvement of the balance of payments, or to joint venture projects in case of foreign investment (Act, p.61).

EPZ: - "The Masan Free Export Zone was established in 1970 to encourage direct foreign investment and exports" (Ministry of Finance, 1986, (b), p.43).

- "Enterprises (which) are eligible for occupancy in a free export zone are those engaged in manufacturing, processing or assembling export goods, if (they are)
 - foreign invested enterprises or joint ventures between foreign and Korean investors".

^{10/} 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 (Ministry of Finance, 1986, pp.1 and 17).

(or) - enterprises with definite export prospects, high foreign exchange earnings, outstanding technical know-how, or high labor intensity" (Ministry of Finance, 1986, (a), pp.38-39).

It will be noticed that the criteria are quite broad for investment in EPZs (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).

In what way/s, therefore, are EPZs in the Republic of Korea "special"? Before answering the question directly it must be said at the outset that 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 it is desirable to maintain the distinction in the interests of clarity.

As an example of the lack of attraction paid to the specificity of EPZs we can cite the 167-page very detailed booklet on doing business in the Republic of Korea of the Korean Traders' Association (1985, pp.68 and 90) where the only comments in connection with the topic are:

"The Free Export Zone Establishment Act sets forth special methods of administering goods brought with and out of Free Export Zones, which differ from the administering of general commodities"; and

"The Korean Government provides foreign invested enterprises with additional privileges on a preferential basis such as admission into industrial estates in order to facilitate plant construction and security of utilities including communication facilities".

Yet the same booklet, in two extensive sections (pp.79 and 84) provides extremely useful information on bonded areas and bonded factories.

Obligated to answer the question posed above - about the "special" nature of EPZs - the economist would have to answer that in the Republic of Korea context there is very little that is special about them. 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.^{11/} But this possibility is also open to other factories in the Republic of Korea if they are "bonded" and, in any case, a customs drawback system operates in respect of imported inputs for exports.

Thus it seems to the writer that a mistaken idea of the exceptional nature of EPZs is given by statements such as the following:

"Free export zones are specially designated industrial areas where foreign-invested firms can manufacture, assemble, or process export products using freely imported tax-free raw materials and or semifinished goods. These areas have the characteristics of a bond, where the application of the pertinent laws and regulations are waived or suspended, and generous tax incentives are provided for foreign-invested enterprises.

These zones were established to encourage direct foreign investment and promote exports" (Korea Exchange Bank, 1984, p.149)

Certainly "generous tax incentives are provided for foreign-invested enterprises" - but they are so provided generally for foreign investors in the Republic of Korea (see Appendix C for a summary). There are no extra tax incentives for firms establishing in the EPZs.

Let us consider the next benefit claimed for operating in an EPZ:

"All the administrative procedures necessary for operation of the occupant enterprises can be easily processed on the spot". (Korea Exchange Bank, 1984, p.151.)

Again, a very useful set of provisions to attract foreign capital. But it would seem that 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, 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 labor office, a quarantine station, and an immigration office."^{12/} (Ministry of Finance, 1986 (a), p.38.)

^{11/} This is not strictly true in practice; this point will be considered later.

^{12/} For an example of the importance of services etc. in industrial estates see Box No.1.

We gather, then, that services provided in all estates are similar. No doubt in practice there are variations in the extent of the services and the efficiency with which they operate; an extensive study would be needed to ascertain this. But at present, on the evidence, we can comment only on the rents and sale prices in the estates. The figures below, derived from various issues of the Ministry of Finance's Investment Guide to Korea, shows lease costs in Masan and Iri EPZs and sale prices of land in general industrial estates:

	Monthly cost/m ² (\$)			Percentage change	
	1981	1984	1985	1981-1985	1984-1985
<u>Masan EPZ</u>					
Lease of Plant Sites	0.0720	0.0620	0.0570	-20.8	-8.1
Lease of Standard Factory	0.9150	0.8760	0.8000	-12.6	-8.7
<u>Iri EPZ</u>					
Lease of Plant Sites	0.0293	0.0330	0.0306	+4.4	-7.3
Lease of Standard Factory	..	0.6780	0.6188	..	-8.7
Ratio Masan EPZ : Iri EPZ					
Lease of Plant Sites	2.46	1.88	1.86		
Lease of Standard Factory	..	1.29	1.29		
Sale prices/m² (\$)					
	Sale prices/m ² (\$)			Percentage change	
	1981	1984	1985	1981-1985	1984-1985
<u>Industrial estates</u>¹³					
Iri:	4.50	2.14	2.14	-52.4	-
Chang Won Machinery	14.00	24.03	24.03	+71.6	-
Yochon Petro-chemical	13.88	11.76	11.76	-15.3	-
On San	9.04	9.04	5.39	-40.4	-40.4
Panwol	27.80	27.80	28.94	+4.1	+4.1
Republic of Korea	90.29	90.29	90.29	-	-
Kumi	13.00	13.00	13.02	-	-

^{13/} Some basic data on all the Estates is given in Appendix Table 4.

Although we cannot compare directly the costs of land and/or factory rentals between EPZs and other estates from the above statistics we can derive at least two interesting conclusions on (a) the relative costs of operating in Masan and Iri EPZs and (b) the trends in rentals in the EPZs and in sale prices in the industrial estates over recent years.

As far as (a) is concerned it would appear that both plant sites and standard factories are relatively more expensive in Masan EPZ than in Iri EPZ. Masan, in effect, was able to charge more because of its preferred location (near Pusan and an international airport) - or because of other perceived advantages. However, the ratio for plant sites was falling between 1981 and 1985 suggesting that as Iri EPZ was filling up^{14/} it was able to increase its rates more steeply than Masan EPZ, or decrease them less rapidly.

Looking at (b) the interesting fact emerges that, except for 1981-85 for plant sites in Iri, EPZ leases have moved in a downward direction. One can only speculate that since 1981 in the case of Masan EPZ, and certainly since 1984 in the case of Iri EPZ, increasing difficulty has been experienced in attracting firms into the EPZs. Over the four year period wholesale prices rose by an average of 9.3 per cent per annum - so it is certainly odd to find, for instance, that in that time Masan EPZ's lease charges for plant sites declined by 20.8 per cent.

As for the general industrial estates the evidence shows that in three of them - Iri, Yochon and On San - sale prices (presumably of land, although the point is not made explicitly) declined some 40 or 50 per cent between 1981 and 1985. Only in Chang Won Machinery Estate was there a significant rise, of 72 per cent (a rise which is an indication of that Estate's growing importance from a locational point of view; it is near Pusan and an international airport

14/ The concept of "filling-up" is usually discussed in the Republic of Korea in terms which are meaningless to the economist. What is 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 labor, capital or skill intensity given the Republic of Korea's factor prices. One could have 100 per cent occupancy of Masan EPZ with 50,000 employees turning out labor-intensive mousetraps ...! The issue of "occupancy rates" is not trivial; it is fundamental to a clear understanding of what the EPZs should presently be producing and where their optimum product-mix in the future lies.

and a considerable extension of its facilities was announced mid-1986). The statistics suggest that the sale prices were set at unrealistically high levels in Iri and On San and that adjustments have had to be made to attract occupants. In the case of Iri, both the General Industrial Estate and the Iri Jewelry Processing Zone were hived off from what was originally intended to be one Export Processing Zone;^{15/} one cannot help wondering whether the original decision to locate an EPZ at Iri was justified.^{16/}

In earlier parts of this chapter it was implied that there were considerable similarities between EPZs and general industrial estates. However, it would be incorrect to conclude that there are no significant differences. For instance, it is claimed that the EPZs are areas where

"the implementation of laws and regulations pertinent to foreign investment, which are normally applied elsewhere, are waived or relaxed." (Ministry of Finance, 1986 (a), p.38)

This could mean much or little; it is never spelled out in more detail.

Another benefit of locating within the EPZs, and of more obvious and practical importance, is that

"any administrative procedures for approval of business activities such as the purchase of land and construction are settled on the spot." (*ibid.*, p.38)

And of analagous, but of even greater, importance:

"The procedure for authorization of foreign investment is simplified (means?) and handled at an office in the zone". (*ibid.*, p.38)

This "one-stop" procedure was frequently commented on with approval by firm representatives within the EPZs.^{17/} In practice it means that the

^{15/} The Jewelry Processing Zone functions as a separate export processing zone.

^{16/} Some of the difficulties now being experienced in establishing industrial estates in the rural areas, specifically to improve farm income, are referred to in Box No.1.

^{17/} In Indonesia, BKPM, the Foreign Investment Coordinating Board, likewise prides itself on operating a "one-stop" service - for all foreign capital coming into the country.

Vol. No. 1

POOR FACILITIES FAIL TO ATTRACT FARMERS TO INDUSTRIAL SITES

Three years after the government initiated an ambitious project for building as many as 100 small sized industrial estates in farming areas, the successful implementation of the program still requires more carefully-designed incentives for attracting companies there.

Policy measures in that direction were among the major topics of a council meeting held last Monday in Busanju, Chollanam-do. The council, organized for policy co-ordination between the central and provincial governments, is chaired by Vice Minister of Economic Planning Moon Hyeob.

Seven such industrial estates are now under construction and 21 rural areas were designated for the industrial zones last year. But only small number of qualified business firms applied for housing in nine out of the 21 selected industrial zones because of their location handicap.

Officials from the provincial governments said at the meeting that because of bad road conditions and other poor infrastructure facilities there companies were reluctant to build their plants in these rural areas. The weak administration of the provincial governments was another reason for their reluctance, they said.

According to the statistics released by the Economic Planning Board (EPB), the ratio of paved roads in farming areas stands at a mere 15 per cent, compared with 74 per cent for the state-constructed national roads.

Poor marketing, banking, information services combined with poor-quality manpower there, were also among the reasons why manufacturers were hesitant about operating their plants in the rural areas.

Furthermore, giant business groups had their own reasons for turning away from the government's (scheme). They could not secure plant sites large enough for their business there because the size of the industrial estates has been limited to less than 100,000 pyong (330,000 sq.m.).

The participants in the Busanju meeting called for more useful incentives to encourage companies to set up operations in these rural industrial estates. Despite their call for more incentives, the government, however, will not be able to solve these problems in one or two years. The problems are of a structural nature.

It was not until 1983 that the government came up with an idea to build industrial estates in farming areas so as to help farmers increase their income.

The government was acting on the judgement that farmers were hardly able to increase their farm income any more because the price of local farm products was considerably high. For example, the price of rice on the local market is 2.5 times of the international level and that of soybeans, 3.3 times.

According to the EPB estimates, if 35 industrial estates in farming areas came into operation, annual income of farmers from the plants there would total 101.7 billion won, compared with total income of about 93 billion won from barley cultivation.

The government also judged that development programs for rural areas in the past were not enough to achieve balanced development of the Korean economy. Programs to that effect since 1970 include National Udoong (New Community Movement), construction of labor-intensive plants that would employ large number of workers, and labor programs for the needy people.

Initiating the program for industrial zones in farming areas, the government introduced a set of incentives for companies.

(KOREA HERALD, 24/75 August 1986)

29 MORE SMALL INDUSTRIAL ESTATES PLANNED IN FARM AREAS

The government yesterday decided to develop 28 more small-sized industrial estates in farming areas this year, in addition to seven where development started last year.

The decision was reached in a committee chaired by Vice Minister of Economic Planning Moon Hyeob, which was organized to form policy measures designed to help farmers increase their nonfarming income.

The sites for new small industrial estates include those located in Chugwon-gun, Ulsang-gun, Cheongsu-gun and Yang-dong-gun of Chungcheong-do. Among others are those in Yongam-gun of Chollanam-do and Honsu-gun of Chungcheong-do.

The committee also decided to pour 12.7 billion won fiscal spendings on constructing estates whose construction will be started this year.

Other 110 businesses are consulting the government on their wish for designation of 26 other new industrial estates in farming areas, it said.

The EPB said the 35 industrial estates will annually generate 101.7 billion won in farmers' income when all plants there enter operation sometime after 1987.

Their earnings are compared with 93.4 billion won which all Korean farmers now earn each year through barley production.

(KOREA HERALD, 29 July 1986)

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 Republic of Korea's 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 labor-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 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 '60s. It is a moot point as to how much of the foreign capital attracted to the EPZs would have entered the Republic of Korea in any case, given the history of dynamic expansion since the beginning of the '60s and given the low wage rates, skilled, dedicated and adaptable labour and stable political environment which characterised the country. It may be that, in effect, part of the economic rents accruing to the projects undertaken were lost to the Republic of Korea Government through its provision of unnecessary incentives.^{18/}

^{18/} The two studies which explicitly make a cost-benefit analysis of Masan EPZ conclude that the rate of return was reasonable. Boum Jong Choe in "An Economic Study of the Masan Free Trade Zone", 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, in "Korea's Masan Free Export Zone: Benefits and Costs" (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, although reasonably heartening to advocates of EPZs, 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.2 STATISTICAL APPRAISAL OF THE REPUBLIC OF KOREA'S EPZ STRUCTURE AND ACTIVITIES

2.1 The firms: number and sectors

Tables 1, 2 and 3 provide preliminary data on total investment (foreign plus domestic) and the number of firms in the two EPZs, Masan and Iri.^{19/} Although 1970 is given as the starting date of Masan EPZ, production and exports did not effectively get under way until 1971. Iri EPZ commenced operations in 1974. It will be seen that in Masan's case the maximum number of firms in the zone, 115, was reached early, viz in 1973. 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, unfortunately, is any information available concerning the reasons for the withdrawal of firms.^{20/}

For Iri, the number of firms continued to grow to 20 in 1985, the present number but, again, one cannot determine whether there were "ins" and "outs".

It is interesting to note that whilst in current terms the value of cumulative investment in the two zones combined has increased year by year, so that by 1985 it was 284 per cent greater than, for instance, in 1974, in real terms cumulative investment has fallen. If we deflate the current values by an index of wholesale prices, which rose by 54 per cent between 1974 and 1985 we find that real cumulative capital investment in the two zones declined by 60 per cent.

^{19/} Hereafter, unless reference is made to the contrary, the names by themselves refer to the EPZs.

^{20/} 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 the Republic of Korea operations altogether. An analogous statistic - again, apparently, on which MTI maintained no records - concerns the number, if any, foreign firms which have applied and apply 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. (See f.n. 14 for a comment on EPZ "capacity".)

Table 1. Cumulative total^{b/} investment and number of participating enterprises in the Masan and IRI EPZs (as of December 31).

Number and \$'million

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 ^{a/}	78	20	98	132.4	17.5	149.9

^{a/} As at 30 June for Masan; as at 31 May for Iri.

^{b/} Foreign plus domestic.

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

Administration Offices of the EPZs.

Table 2. Firms by products within the Masan and Iri Export Processing Zones, as at 31 March 1986

No of firms and \$'000

Sector	Number of Firms				Investment (\$'000)			
	Masan EPZ	Iri EPZ	Total No.	Per cent	Masan EPZ	Iri EPZ	Total	Per cent
Electronics and Electric	23	1	24	24.7	69,974	1,384	71,358	50.7
Metal	16	1	17	17.5	22,480	349	22,829	16.2
Precision machinery	9	-	9	9.3	13,840	-	13,840	9.8
Textiles	8	8	16	16.5	5,424	9,184	14,608	10.4
Machinery	4	-	4	4.1	2,039	-	2,039	1.4
Footwear	5	-	5	5.2	6,543	-	6,543	4.7
Non-Metal	5	-	5	5.2	1,319	-	1,319	0.9
Leather	-	5	5	5.2	-	2,270	2,270	1.6
Stone Processing	-	3	3	3.1	-	908	908	0.6
Others	8	1	9	9.3	4,688	227	4,915	3.5
Total	78	19	97	100.0	126,308	14,323	140,630	100.0

Source: Ministry of Trade and Industry.

Table 3. Firms by products within the Masan and Iri Export Processing Zones, as at 30 June 1986^{a/}

No. of firms and \$'000

Sector	Number of Firms ^{b/}				Investment (\$'000)			
	Masan EPZ	Iri EPZ	Total No.	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 ^{c/}	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 ^{d/}	9	9.5	1,319	-	1,319	0.9
Leather	-	- ^{e/}	-	-	-	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
Total	77	18	95	100.0	132,440	17,475	149,915	100.0

^{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.

Sources: Administration offices of Masan and Iri EPZs.

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, one finds a real decline in the average size - a decline of 55 per cent.

Tables 2 and 3 are identical except that Table 2 refers to March 1986 and Table 3 to June 1986. It was thought that it might be interesting to observe the changes that can occur in a short interval of three months. Essentially, what happened was the following:

- Hsan and Iri both lost a firm, reducing total numbers from 97 to 95
- Total cumulative investment rose from \$140.6 million to \$149.9 million, a rise of 6.6 per cent.
- The average investment per firm rose from \$1.45 million to \$1.58 million, a rise of 8.8 per cent.
- It appears that the firm Masan lost was in the "precision machinery" sector (a drop from 9 firms to 8) - yet that conclusion is not borne out by the investment figures which show identical investment in this sector in the two periods.
- The Iri changes are more confusing. On the statistics, it would appear that in that 3-months period the EPZ gained 4 companies in the "non-metal" (also translated as the "non-ferrous-metal" sector); it had none in March.
- Iri appears to have lost all its 5 firms in the "leather" sector over the 3-months period.^{21/}

2.2 Investment: foreign and domestic

Tables 4 to 15 present data referring to investment, foreign and domestic, by country and sector. Comparisons are made between the EPZs and the Republic of Korea. Tables 4 and 5 refer to Masan and are identical except that Table 4 refers to March 1986 and Table 5 to June 1986.

^{21/} The comments about observed changes in such a short period point to the necessity of obtaining detailed information on the firms which come into and leave the zones.

Table 4. Investment in Japan, RFP, by country and sector, as at 31 March 1986.

Sector	Number of firms (in brackets) and \$'000												
	Japan			USA			Republic of Korea			Others			
	Wholly Foreign Ventures	Joint Ventures	Total	Wholly Foreign Ventures	Joint Ventures	Total	Wholly Foreign Ventures	Joint Ventures	Total	Wholly Foreign Ventures	Joint Ventures	Total	
Electronics and Electric	64,422 (18)	728 (2)	65,150 (20)	1,500 (1)	423 (1)	1,923 (2)	-	-	2,901 (1)	2,901 (1)	65,922 (19)	4,052 (4)	69,974 (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)	3,557 (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)
Total	89,318 (40)	14,137 (16)	103,454 (56)	1,705 (2)	3,845 (6)	5,550 (8)	13,902 (12)	-	3,201 (2)	3,201 (2)	105,125 (54)	21,183 (24)	126,308 (78)

g/ Includes Republic of Korea.

SOURCE: Ministry of Trade and Industry.

Table 5. Investment in Massan EPZ by country and sector, as at 30 June 1986

Number of firms (in brackets) and \$'000

Sector	Japan			USA			Republic of Korea			Others			Total		
	Wholly Foreign Ventures	Joint Ventures	Total	Wholly Foreign Ventures	Joint Ventures	Total	Wholly Foreign Ventures	Joint Ventures	Total	Wholly Foreign Ventures	Joint Ventures	Total	Wholly Foreign Ventures	Joint Ventures	Total
Electronics and Electric	70,354 (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 (3)	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 (2)	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 (5)	-	-	-	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)		
Total	93,630 (40)	14,137 (16)	109,787 (56)	1,703 (2)	3,845 (6)	5,550 (8)	13,902 (12)	-	3,201 (2)	3,201 (2)	111,257 (54)	21,183 (24)	132,440 (78)		

g/ Includes Republic of Korea

SOURCE: Administration Office of Massan EPZ.

Some of the conclusions which emerge from Tables 4 and 5 are the following:

- Republic of Korea investment in Masan constitutes 10 to 11 per cent of the total.^{22/}
- Joint ventures in Masan constitutes 16.8 per cent of the total investment.
- Japanese investment is predominantly fully-Japanese owned (87 per cent) whereas in the US case a minority is fully-US owned (31 per cent). This clearly reflects different attitudes towards the desirability or the necessity of having a Republic of Korea partner. It is noticeable that Japanese fully-owned investment increased by some \$6 million between the first and second quarters of 1986 whilst there was no change in Japan-Republic of Korea joint ventures. The whole of the additional Japanese investment was in the "electronics and electric" sector.
- Investment in Masan, other than from Japan and USA, is negligible - only some 2.5 per cent of the total.

Tables 6 and 7 refer to Iri and again are identical except that the former is dated March 1986 and the latter May 1986. Both are included to show the dramatic surge of joint ventures investment which occurred in that short period—a rise from \$6.9 million to \$10.0 million, or 45.7 per cent. Wholly foreign-owned investment remained static over the period. A country breakdown is not available for Iri.

Tables 8 and 9 refer to Masan and are identical except for the fact that Table 8 is dated March 1986 and Table 9, June 1986. They show the proportion of investment held in various sectors by different countries and have been derived from Tables 4 and 5. Most Japanese investment clearly is made in the "electronics and electric" industry (63 per cent in March 1986 and going up to 65 per cent in June 1986). On the other hand, US investment is concentrated in the "footwear" sector (45 per cent of USA's total investment). The Republic of Korea has no investment in the "electronics and electric" sector, holding about one half of its total investment in the "metal" sector (of small importance to Japan and USA and of zero importance to other countries).

^{22/} Only from 1980 was a national of the Republic of Korea permitted to own an occupant enterprise in its entirety (Kim, 1981, p.3).

Table 6. Investment in Iri EPZ by sector as at March 1986

Sector	Number of firms ^{a/} and \$'000			
	Wholly Foreign \$'000	Joint Ventures \$'000	Total \$'000 (No.)	Per cent
Textiles	3,834	5,349	9,184 (8)	64.1 (42.1)
Leather	1,459	811	2,270 (5)	15.8 (26.3)
Electronics	1,361	24	1,384 (1)	9.7 (5.3)
Stone processing	660	248	908 (3)	6.3 (15.8)
Metal	-	349	349 (1)	2.4 (5.3)
Other	114	114	227 (1)	1.6 (5.3)
Total	7,428	6,895	14,323 (19)	100.0 (100.0)

a/ Only the total number of firms in each sector is available.

Source: Ministry of Trade and Industry.

Table 7. Investment in Iri EPZ by sector as at 31 May 1986

Sector	Number of firms ^{a/} and \$'000			
	Wholly Foreign \$'000	Joint Ventures \$'000	Total \$'000 (No.)	Per cent
Textiles	3,834	5,349	9,184 (8)	52.6 (40.0)
Leather	1,459	811	2,270 (5)	13.0 (25.0)
Electronics	1,361	24	1,384 (1)	7.9 (5.0)
Stone processing	660	248	908 (3)	5.2 (15.0)
Metal	-	3,501	3,501 (2)	20.0 (10.0)
Other	114	114	227 (1)	1.3 (5.0)
Total	7,428	10,046	17,475 (20)	100.0 (100.0)

a/ Only the total number of firms in each sector is available.

Source: Administration Office of Iri EPZ.

**Table 8. Proportion of investment^{a/} held in various sectors
by countries: Masan EPZ, as at March 1986**

Sector	Per cent			
	Japan	USA	Republic of Korea	Others (per cent)
Electronics and Electric	62.9	34.8	-	90.6
Metal	14.5	9.9	49.3	-
Precision machinery	12.7	3.7	3.6	-
Textiles	1.1	-	28.9	9.4
Machinery	1.8	3.5	-	-
Footwear	2.3	44.6	11.8	-
Non-metal	0.2	3.7	6.4	-
Others	4.5	-	-	-
Total	100.0	100.0	100.0	100.0

^{a/} Includes wholly foreign-owned and joint ventures.

Source: Table 3.

**Table 9. Proportion of investment^{a/} held in various sectors
by countries: Masan EPZ, as at 30 June 1986**

Sector	Per cent				
	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	-	10.5
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
Total	100.0	100.0	100.0	100.0	100.0

^{a/} Includes wholly foreign-owned and joint ventures.

Source: Table 4.

Tables 10 and 11 again refer to Masan, for March and June 1986 respectively. They show the country-concentration of investment in each sector. For instance, some 94 per cent of all the investment in the "electronics and electric" sector is Japanese; 74 per cent of investment in the "textile" sector is from the Republic of Korea. Of the total investment made in Masan 83 per cent is Japanese and 4 per cent is American.

Table 12 presents a wide range of statistics from 1970 to May 1986 on EPZ and Republic of Korea investment in order to obtain a general picture of the importance of the EPZs in the Republic of Korea economy. As will be seen, for both Masan and Iri statistics are presented for domestic and foreign investment for all the years with the object of ascertaining the growth in the relative importance of domestic investment in both zones.

Let us start with Masan in 1971. Over the next five years domestic investment formed 6 or 7 per cent of the total. From 1977 on domestic investment began to increase proportionately and rose to a peak of 28.7 per cent in 1982. From here it fell steadily to 22.0 per cent in May 1986 - a figure somewhere between the 1980/1981 proportions. However, it is remarkable that since 1981 about one quarter of the cumulative value of total investment in Masan has been owned by Republic of Korea 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 Republic of Korea 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 in the Republic of Korea. Clearly the permission granted in 1980 for Republic of Korea nationals to fully own an EPZ enterprise (mentioned in f.n. 22) 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 10. Proportion of total investment^{a/} in sectors held by various countries: Masan EPZ, as at March 1986

Per cent					
Sector	Japan	USA	Republic of Korea	Others	Total
Electronics and Electric	93.1	2.7	-	4.1	100.0
Metal	67.0	2.4	30.5	-	100.0
Precision machinery	94.9	1.5	3.6	-	100.0
Textiles	20.4	-	74.0	5.5	100.0
Machinery	90.5	9.5	-	-	100.0
Footwear	37.1	37.8	25.0	-	100.0
Non-metal	17.0	15.5	67.5	-	100.0
Others	100.0	-	-	-	100.0
Total	82.1	4.4	11.0	2.5	100.0

^{a/} Includes wholly foreign-owned and joint ventures.

Source: Table 3.

Table 11. Proportion of total investment^{a/} in sectors held by various countries: Masan EPZ, as at 30 June 1986

Per cent					
Sector	Japan	USA	Republic of Korea	Others	Total
Electronics and Electric	93.7	2.5	-	3.8	100.0
Metal	67.0	2.4	30.5	-	100.0
Precision machinery	94.9	1.5	3.6	-	100.0
Textiles	20.4	-	74.0	5.5	100.0
Machinery	90.5	9.5	-	-	100.0
Footwear	37.1	37.8	25.0	-	100.0
Non-metal	17.0	15.5	67.5	-	100.0
Others	100.0	-	-	-	100.0
Total	82.9	4.2	10.5	2.4	100.0

^{a/} Includes wholly foreign-owned and joint ventures.

Source: Table 4.

Table 12. Cumulative^{a/} foreign and domestic investment in Masan and Iri EPZs and Republic of Korea

	Masan EPZ				Iri EPZ				Masan and Iri EPZs			
	Investment		as Proportion of Total		Investment		as Proportion of Total		Investment		as Proportion of Total	
	\$ million	Per cent	\$ million	Per cent	\$ million	Per cent	\$ million	Per cent	\$ million	Per cent	\$ million	Per cent
1970	0.2	13.9	-	-	-	-	-	-	0.2	1.2	1.4	13.9
1971	0.4	7.3	-	-	-	-	-	0.4	4.9	5.3	7.3	
1972	2.0	5.4	-	-	-	-	-	2.0	34.9	36.9	5.4	
1973	4.0	4.9	-	-	-	-	-	4.0	78.8	82.8	4.9	
1974	6.7	7.6	0.07	2.1	2.2	3.2	27.8	6.8	84.3	91.1	7.5	
1975	6.2	6.9	1.9	4.9	6.8	8.1	27.8	8.1	87.7	95.8	8.5	
1976	6.6	6.8	1.8	5.8	7.7	8.4	23.7	8.4	97.2	105.6	8.0	
1977	10.5	10.1	2.8	11.4	14.2	20.0	20.0	13.3	104.9	118.2	11.3	
1978	14.6	13.0	2.4	7.2	9.6	25.2	17.0	17.0	104.6	121.6	5.8	
1979	13.0	11.3	2.4	6.1	8.5	28.0	15.4	15.4	107.7	123.1	12.5	
1980	19.7	17.5	2.2	5.7	7.9	27.9	21.9	21.9	98.8	120.7	18.1	
1981	31.1	26.3	4.4	7.6	12.0	36.6	35.5	35.5	93.7	129.2	27.5	
1982	33.3	28.7	3.3	8.4	11.8	28.2	36.6	31.3	91.3	127.9	13.1	
1983	33.4	28.2	7.1	8.6	15.7	45.0	40.5	40.5	93.4	133.9	30.2	
1984	30.5	23.8	7.6	9.2	16.8	45.2	38.1	38.1	106.9	145.0	26.3	
1985	29.5	23.4	6.8	7.4	14.3	47.9	36.3	36.3	103.8	140.1	25.9	
1986.5	29.1	22.0	10.0	7.4	17.5	57.5	39.1	39.1	110.7	149.8	26.1	

Notes and sources: Below continuation of Table on following page.

Table 12 (continued)

	Total Republic of Korea Investment Funded From		Masan and Iri EPZs	
	Foreign direct investment ^{b/}	Domestic & foreign direct investment ^{b/} plus other net capital inflows (= Total domestic capital formation)	Foreign investment as proportion of total foreign- direct investment	Domestic & foreign investment as proportion of 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	289	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
1986.5	..	..	..	..

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 that which is titled "Foreign Investment by Year" by the Ministry of Finance and this 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.

Sources and notes: 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.

The Table (penultimate column) also shows the importance of investment in Masan and Iri in relation to total direct investment. From 1970 to 1973 investment in Masan rose from 8.6 per cent of total direct investment in the Republic of Korea to a 1970-85 peak of 27.3 per cent. Thereafter the relative importance steadily declined, to 8.9 per cent in 1980 and 3.7 per cent in 1985. The addition of Iri adds about one half of one per cent to the Masan proportions. For instance, in 1974 Masan's cumulative investment alone constituted 22.6 per cent of cumulative direct investment in the Republic of Korea; 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. This series, of course, is a manifestation of the attractiveness of the the Republic of Korea in general to foreign capital; it is only to be expected that the EPZs would decline in relative importance.

The final column serves merely to underscore the last comment: taking the domestic and foreign capital together which has been invested in the zones 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 0.07 per cent in 1985.

Dealing in cumulative investment statistics, as is done in Table 12, does, however, obscure some of the interesting annual movements which took place. Table 13 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. It will be seen that there were a number of years when there was a net capital flow out of the zones (1980 to 1982 and 1985 for Masan; 1978 to 1980 and 1985 for Iri). 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. With this in mind, we see that in the year 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" 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 deepening of capital was taking place in Masan, probably primarily due to re-investment of part of

Table 13. Foreign investment in Masan and Iri EPZs in relation to total foreign direct investment in Republic of Korea^{c/}
\$'000 and Per cent

Year ^{a/}	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	77,312	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 ^{b/}	6,888	0	6,888	..	..

a/ During the year.

b/ Up to May 1986.

c/ For note on foreign direct investment see note (b) to Table 12.

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".)

the profits. And in 1976 total 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.

Table 14 presents information on the countries of origin of investment in the Republic of Korea and in Masan and Iri over the years 1962-1985. The growing importance of Japan is evident: from a mere 3.0 per cent of foreign investment in the Republic of Korea in 1962-66 to 52.4 per cent in 1982-85. Over the whole period Japan contributed 51.6 per cent of all foreign capital. However, the average value of Japanese projects is relatively small - \$1.8 million as opposed to \$4.2 million for European projects and \$2.2 million for the average.

As has been indicated previously the overwhelming importance of Japanese investment in Masan and Iri is clear; in mid-1986, 93 per cent in Masan and 81 per cent in Iri. Table 14 also shows that the average Japanese investment in Masan was larger than the average of all Japanese projects in the Republic of Korea. But in Iri Japanese projects are smaller than the overall Japanese average. Finally, it is interesting to note that Masan and Iri together account for some 9 per cent of total Japanese investment in the Republic of Korea, but for less than 1 per cent of American investment in the country.

Table 5, it will be recalled, set out to depict sectoral investment in Masan by country in June 1986. The analysis has been deepened, to the extent it is possible to find correspondence between Republic of Korea and Masan sectors, to examine the Republic of Korea/Masan differences in the sectoral investment patterns. Briefly, one finds the following situation:

- Japan's investment in the electric and electronics sector is relatively much more important in Masan (65 per cent of its total Masan investment) than in the Republic of Korea (10 per cent of its total Republic of Korea investment). It also appears that of all Japanese investment in this sector, about 53 per cent is in Masan and 47 per cent in the rest of the Republic of Korea.
- For the USA, however, the relative importance of this sector is nearly the same inside the EPZ and in the Republic of Korea as a whole.

Table 14. Foreign investment in Republic of Korea and Masan and Iri EPZs

\$million, per cent and number

<u>Republic of Korea</u>					
	<u>Japan</u>	<u>USA</u>	<u>Europe</u>	<u>Others</u>	<u>Total</u>
	<u>\$ million</u>				
1962-66	0.7 (3.0)	21.9 (95.2)	0.3 (1.4)	0.1 (0.4)	23.0 (100.0)
1967-71	40.8 (56.1)	12.4 (17.1)	9.0 (12.3)	10.5 (14.4)	72.7 (100.0)
1972-76	376.9 (66.7)	67.9 (12.0)	68.5 (12.1)	51.9 (9.2)	565.2 (100.0)
1977-81	214.9 (36.6)	208.1 (35.4)	95.0 (16.2)	69.7 (11.9)	587.7 (100.0)
1982-85	737.3 (52.4)	461.2 (32.8)	112.3 (8.0)	95.5 (6.8)	1,406.3 (100.0)
1962-85	1,370.6 (51.6)	771.5 (29.1)	285.1 (10.7)	227.8 (8.6)	2,655.0 (100.0)
<u>Number of Projects</u>					
1962-85	772 (65.1)	248 (20.9)	68 (5.7)	98 (8.3)	1,186 (100.0)
<u>Average Value of Investment per Project(\$ million)</u>					
1962-85	1.8	3.1	4.2	2.3	2.2
			3.1		
<u>Masan EPZ</u>					
Value as at 30 June 1986 \$ mill. (per cent)		109.8 (92.7)	5.6 (4.7)	3.2 (2.7)	118.5 (100.0)
Number of projects No. (per cent)		56 (84.8)	8 (12.1)	2 (3.0)	66 (100.0)
Average value per project.\$ mill.		2.0	0.7	1.6	1.8
<u>Iri EPZ</u>					
Value as at 31 May 1986 \$ mill.(per cent)		7.8 (81.3)	0.3 (3.1)	1.5 (15.6)	9.6 (100.0)
Number of projects No. (per cent)		10 (83.3)	1 (8.3)	1 (8.3)	12 (100.0)
Average value per project.\$ mill.		0.8	0.3	1.5	0.8

continued

Table 14 (continued)

Republic of Korea				
Japan	USA	Europe \$ million	Others	Total
<u>Masan and Iri EPZs</u>				
Value as at mid-1986 \$ mill.(per cent)	117.6 (91.7)	5.9 (4.6)	4.7 (3.7)	128.2 (100.0)
Number of projects No. per cent	66 (84.6)	9 (11.5)	3 (3.8)	78 (100.0)
Average value per project.\$ mill.	1.8	0.7	1.6	1.6
<u>Masan and Iri EPZs as percentage of Republic of Korea</u>				
Value as at c. 1985/86 per cent	8.6	0.8	0.9	4.8
No. of projects per cent	8.5	3.6	1.8	6.6
Average value of project	100.0	22.6	58.1	72.7

Sources: Administration Offices of EPZs, Ministry of Finance, Investment Guide to Korea, 1980, Appendix Two, Table II, p. 99 and EPB. Major Statistics of Korean Economy 1986. Table 10-22, p. 253.

Table 15. Foreign investment by country and industry, Republic of Korea^{a/} and Masan EPZ^{b/}

\$ million and per cent

Sector ^{c/}	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 ^{d/}	103.8	7.6	15.0	13.7	157.3	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
Total	1,370.6	100.0	109.8	100.0	771.5	100.0	5.6	100.0	512.8	100.0	3.2	100.0	2,655.0	100.0	118.6	100.0
Per cent of total:																
Republic of Korea	51.6				29.1				19.3				100.0			
Masan EPZ			92.6				4.7				2.7				100.0	

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.

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

- Other countries' investment in Masan is almost exclusively in this one sector (91 per cent) whilst for the Republic of Korea as a whole only 8 per cent of other countries' investment is directed to this sector.
- As far as total investment in Masan is concerned 64 per cent of it is in the electric and electronics sector whilst for all foreign investment in the Republic of Korea 15 per cent only is made in the sector.

Thus, in general, it is clear that the electric and electronics sector is relatively a much more favoured sector in Masan than it is in the Republic of Korea as a whole. (A similar analysis could not be carried out for Iri because of the lack of a country/sector investment breakdown.)

2.3 Exports and net export earnings

The main data for an examination of exports and net export earnings from Masan and Iri is to be found in Tables 16-21 and also in Table 31.

Tables 16 and 17 are fundamental to an understanding of the historical trend of exports from the two zones and for a clear^{23/} depiction of net foreign exchange earnings and of factor and non-factor costs (the last, both foreign-imported and domestic). A rigorous setting-out of all the components enables one to calculate value added and, ultimately, profitability.

23/ Clarity is stressed because all too often in the literature on EPZs, including that on Masan and Iri, one comes across "Snippets" of information about these variables without the whole picture's being presented. The following is the type of comment one frequently reads: "In the Masan Zone of the Republic of Korea, imports constituted 72 per cent of exports in 1971. By 1978 this ratio had fallen to 52 per cent. In the same zone the share of domestic raw materials in total foreign currency earnings increased from 6 per cent in 1971 to 37 per cent in 1975". (UNIDO, 1980, p.26 quoting Kelleher, 1976, p.81.) Now although the statements may be correct the meaning remains blurred. Even worse is when the statistic is completely misunderstood. In a 1984 OECD Report one reads: "Between 1971 and 1979, local value added as a percentage of export value (in Masan EPZ) rose from 28 to 52 per cent ..." (Basile and Germidis, 1984, p.48). But this proportion does not refer to "value added"; what is meant is "net foreign exchange earnings" which include payments to local materials' suppliers. When the word "local" is dropped we have the even worse confusion of: "An exceptional case is the Masan EPZ ... where the share of value added increased from 27.8 per cent in 1971 to 52.2 per cent in 1979" (UNCTAD, 1985, p.21). Masan EPZ was only "exceptional" because the statistic was misunderstood! What the figures in fact depict was, in fact, mentioned correctly in this UNCTAD Report a few pages further on: "The Masan EPZ ... recorded foreign exchange earnings of 27.8 per cent of gross exports in 1971" (UNCTAD, 1985, p.24).

Looking at Table 16 we note first of all that the "net foreign exchange earnings" to the Republic of Korea economy are the sum of payments for domestic materials, wages, rent and services (electricity etc.). As a proportion of total Masan exports these rose from about 22 per cent in 1971 to 51 per cent in 1985. However, there has been hardly any perceptible increase in the proportion since 1976/77. Interesting, "services" constitutes a high proportion of net foreign exchange earnings, being almost as important as firms' expenditures on domestic materials.

A second measure of the degree of "linkage" with the domestic economy is shown in column 9 where the proportion of domestic raw materials in total raw material usage is calculated. We see that the proportion was very small in the early days of Masan (3 to 6 per cent) but that it quickly rose to one quarter and then to one-third. But it has remained at one-third since 1976/77.

As can be seen in the table (column 13) it was possible to calculate value added as a proportion of gross output and whilst there have been fluctuations there is an unmistakable downward trend; it appears that non-factor inputs have been growing more rapidly than exports.

Table 17 presents similar data for Iri. In general it appears that net foreign exchange earnings as a proportion of exports have been rather lower for Iri than for Masan. Even more disturbing is the fact of a declining trend from 1977 to 1985. Domestic raw materials as a proportion of total raw materials over that period are hardly any higher than for Masan at the beginning of its operating period (Masan, 6.0 per cent in 1972; Iri, an average of 7.5 per cent 1977-85). The Iri proportion is less than one-quarter of the Masan figure.

From a value added point of view, however, Iri is particularly strong. Over the period 1977-85 value added as a proportion of exports averaged 15.2 per cent whilst in Masan over the same period it averaged 11.7 per cent.

An interesting point emerges from comparing the last columns of Table 16 (Masan) and Table 17 (Iri): the profitability (i.e. from a private point of view) is considerably higher in Iri than in Masan. (See Table 24 for further statistics on Masan's profitability.)

Table 16. Mean EPZ. Exports. Net foreign exchange earnings. factor and non-factor inputs

	Per cent													Per cent		Per cent		Per cent		Per cent	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)		
Exports	Net foreign exchange earnings		Domestic raw materials used		Domestic raw materials used		Domestic raw materials used		Domestic raw materials used		Domestic raw materials used		Domestic raw materials used		Domestic raw materials used		Domestic raw materials used		Domestic raw materials used		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)		
171	0.9	0.02	0.16	0.02	0.05	0.2	22.2	0.6	3.3	0.9	-	0.2	22.2	0.7	0.9	-	80.0	-			
172	0.7	0.4	1.4	0.2	1.0	1.0	30.9	6.7	6.0	9.3	0.4	2.0	20.6	7.7	9.7	0.2	70.0	4.1			
173	26.4	11.2	8.4	0.7	5.6	25.9	38.8	48.6	23.0	63.3	7.1	18.2	23.0	54.2	70.4	43.8	51.9	10.1			
174	181.5	27.6	18.1	1.1	23.4	79.1	125.2	125.2	22.0	167.8	13.7	38.9	18.1	148.6	181.5	41.6	55.0	7.3			
175	174.8	30.3	20.8	1.0	19.9	72.0	124.1	124.1	24.4	165.8	9.0	30.8	17.6	144.0	174.8	29.2	67.5	2.1			
176	303.0	63.7	30.0	1.1	34.3	149.1	212.5	212.5	30.0	297.9	5.1	38.2	11.9	264.8	303.0	14.1	82.9	1.7			
177	307.9	88.9	40.1	1.4	50.4	180.9	266.2	266.2	33.4	358.3	9.4	51.1	13.9	316.8	307.9	18.8	78.5	2.4			
178	484.8	108.8	49.9	1.5	81.0	251.2	350.1	350.1	31.1	492.5	-7.7	63.7	9.0	461.1	484.8	-17.6	114.2	-15.9			
179	606.6	148.3	65.3	1.7	99.3	311.0	427.3	427.3	33.8	594.0	6.6	73.8	12.3	528.8	606.6	8.9	88.8	3.1			
180	628.1	142.9	56.7	1.9	131.6	333.0	432.5	432.5	33.0	677.7	5.4	84.0	10.2	564.1	628.1	6.4	86.6	0.9			
181	696.3	150.9	61.0	2.1	160.2	371.6	461.0	461.0	32.7	683.7	14.6	75.1	10.8	621.2	696.3	19.4	77.8	2.1			
182	651.3	142.7	61.0	2.1	118.8	324.5	398.4	398.4	35.8	580.3	21.0	84.1	14.0	517.3	651.3	25.0	72.3	2.5			
183	704.5	155.6	67.8	2.2	148.2	373.7	473.0	473.0	32.9	691.2	15.3	85.3	12.1	621.2	704.5	17.9	79.5	2.2			
184	818.6	193.4	80.0	2.1	170.3	444.0	623.9	623.9	30.7	876.5	2.1	84.2	9.6	784.4	818.6	2.5	95.0	0.24			
185	869.3	183.3	79.6	2.0	147.8	412.6	550.7	550.7	33.3	780.1	29.2	110.8	13.7	698.3	869.3	20.4	71.8	3.6			

Source: Primarily based on statistics provided by Mean EPZ Administration Office and MTI

Table 17. Iri BZL Exports, Net foreign exchange earnings, factor and non-factor inputs

\$ million and per cent

Exports	Net foreign exchange earnings		Net foreign exchange earnings as materials used	Total raw materials used	Domestic raw materials as proportion of total raw materials (2)/(8)	Wages + services + raw materials (3)+(4)+(5)	Value added as proportion of gross output (12)/(13)	Non-factor inputs (5&B)	Gross output - value of exports (13)-(14)	Profit as proportion of value added (11)/(12)	Wages as proportion of value added (10)/(12)	Profit as proportion of value added (11)/(12)					
	(1)	(2)											(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1977	18.6	0.7	0.6	0.02	7.4	8.9	47.8	9.7	7.6	1.32	17.9	0.7	17.2	18.6	33.0	43.5	3.8
1978	33.7	1.1	1.7	0.07	13.6	18.3	34.9	15.2	6.0	2.87	32.4	1.1	30.8	33.7	38.5	39.2	3.3
1979	62.5	0.8	2.7	0.08	14.6	18.2	42.8	24.2	4.3	3.78	41.4	0.9	38.8	42.5	32.8	71.4	2.1
1980	64.	1.2	4.5	0.10	13.6	19.4	42.1	23.8	6.0	6.70	44.0	2.1	38.4	46.1	31.3	67.2	4.6
1981	53.4	1.6	3.2	0.17	14.8	21.8	40.8	29.3	7.2	9.27	49.3	3.9	46.1	53.4	42.1	36.1	7.3
1982	57.2	2.1	6.1	0.20	14.0	22.4	39.2	32.7	9.5	10.50	53.0	4.2	48.7	57.2	40.0	58.1	7.3
1983	62.0	2.3	7.2	0.21	13.6	23.3	37.6	36.3	9.9	12.11	57.3	4.7	49.9	62.0	38.8	59.5	7.6
1984	74.8	2.4	9.6	0.21	17.8	30.2	40.4	40.7	8.6	16.31	68.2	6.5	58.5	74.8	39.9	58.9	8.7
1985	60.4	2.4	9.7	0.18	18.9	31.2	38.8	44.3	8.2	16.98	73.1	7.3	63.4	80.4	43.0	55.9	9.1

Source: Primarily based on statistics provided by Iri BZL Administration Office and WTI.

Tables 18 and 19 look at exports by category over a period of years for Masan and Iri respectively. As a preliminary comment we might note that Masan and Iri exports together constituted 3.1 per cent of exports of manufactures from the Republic of Korea in 1985.

Within Masan, and excluding the first major year of operation, 1971, there has been a slight increase in the importance of electric and electronic manufactures in the zone's total exports - from 53 per cent in 1975 to 64 per cent in 1985. But the item which showed the greatest increase in relative importance was precision machinery (from 4 per cent of the total in 1975 to 14 per cent in 1985). This category of exports grew by 33 per cent per annum (in current value terms) over the period. Masan's total exports grew rather more slowly 1975-85 than did exports of manufactures from the Republic of Korea as a whole - 17 per cent per annum as against 24 per cent per annum. Only one item in the Masan export categories could be identified which corresponded to the Republic of Korea export categories.^{24/} This was "footwear".^{25/} It is interesting to note that the relative importance of footwear exports in Masan's bundle of export goods is approximately the same as that for the whole of the Republic of Korea - some 4 to 5 per cent.

Iri's exports are obviously dominated by textiles - 74 per cent in 1981, 64 per cent in 1985. But metals and electrical items have tripled their relative importance over those four years and have shown annual growth rates of 47 and 44 per cent respectively.

Statistics of exports by country of destination are available only for Masan. They are given in Table 20. The importance of Japan and USA as markets is clear; between them these two countries took 85 per cent of Masan's exports in 1978. The proportion was still as high in 1985 and the first-half of 1986. Except for the year 1978 (of the years quoted in the table) Japan took a considerably higher proportion than USA. This is contrary to the

^{24/} This is just one example of the desirability of standardizing KPZ statistics along the Republic of Korea and, ultimately, international lines.

^{25/} Called, confusingly, in Masan's statistics up to 1981, "chemical".

Table 18. Masan EPZ: Exports by category, and Republic of Korea: Exports of manufactures, Selected years, 1971-1985

\$ million and per cent

Sector	1971		1975		1980		1985		Rate of increase 1975 - 1985 Per cent per annum
	\$ million	Per cent	\$ million	Per cent	\$ million	Per cent	\$ million	Per cent	
Electronics and electrical	0.8	96.4	93.4	53.4	394.8	62.9	521.3	64.4	18.8
Metal	-	-	29.3	16.7	51.1	8.1	64.3	7.9	8.2
Non-ferrous metal	-	-	-	-	2.6	0.4	3.0	0.4	-
Machinery	-	-	7.5	4.3	7.8	1.2	21.8	2.7	11.3
Precision machinery	-	-	7.0	4.0	79.8	12.7	115.6	14.3	33.0
Textiles and garments	0.01	1.0	8.4	4.8	11.7	1.9	22.4	2.8	10.3
Footwear	-	-	8.0	4.6	38.3	6.1	36.4	4.5	16.4
Other	0.02	2.6	21.2	12.1	42.0	6.7	24.5	3.0	1.5
Total	0.86	100.0	174.8	100.0	628.1	100.0	809.3	100.0	16.6
Republic of Korea:									
Exports of footwear ^a / Total exports of manu- factures	37.4	3.2	191.2	4.0	874.5	5.4	1,534.3	5.3	23.5
	1,162.9	100.0	4,791.2	100.0	16,150.8	100.0	28,879.6	100.0	19.7

a> Footwear is the only category in Republic of Korea export statistics which corresponds to a category in Masan EPZ export statistics.

Sources: Masan EPZ: Ministry of Trade and Industry.

Republic of Korea: EPB, Major statistics of Korean Economy 1986, Tables 10-4a and 10-7b, pp.225 and 232.

Table 19. Iri EPZ: Exports by category, selected years 1981-1985

\$'000 and per cent

	1981		1983		1985		Rate of increase 1981 - 1985 Per cent per annum
	\$ '000	Per cent	\$ '000	Per cent	\$ '000	Per cent	
Textiles	39,419	73.8	40,819	65.8	51,193	63.6	6.8
Leather	10,135	19.0	13,972	22.5	17,596	21.9	14.8
Metals	331	0.6	852	1.4	1,549	1.9	47.1
Electrical	1,716	3.2	4,239	6.8	7,440	9.2	44.3
Stone processing	1,777	3.3	2,135	3.4	2,715	3.4	11.2
Total	53,378	100.0	62,017	100.0	80,493	100.0	10.8

Source: NTI.

Table 20. HASAN RPZ: Exports by country of destination. Selected years, 1978 to 1986

	1978		1980		1982		1984		1985		1986 (first half)		Rate of Growth of	
	\$ '000	Per cent	\$ '000	Per cent	\$ '000	Per cent	\$ '000	Per cent	\$ '000	Per cent	\$ '000	Per cent	Value of exports/ 1978 - 1986 ^{a/}	Volume of exports/ 1978 - 1986 ^{b/}
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	12.6	10.3
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	3.0	0.9
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	3.1	1.0
Hong Kong	6.9	1.7	56.3	10.3	40.1	8.2	26.2	3.5	20.3	2.9	12.1	3.2	17.0	14.9
West 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	12.5	10.4
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	-8.0	-10.0
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	-24.0	-24.0
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	14.2	12.1
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	3.1	1.0
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	20.2	18.1
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	9.3	7.2
Total d/ of countries to which exports consigned	416.1	100.0	538.2	100.0	489.2	100.0	738.4	100.0	695.8	100.0	378.5	100.0	7.7	5.6g/
	49		57		56		62		63		56			

a/ Year 1986 estimated from first half of year statistics.

b/ The volume has been calculated by deflating the value rate of growth by the rate of growth of the Republic of Korea Export Price Index (from Bank of Korea Economic Statistics Yearbook and Monthly Statistical Bulletin).

c/ c.f. an approximately calculated rate of growth of volume of Republic of Korea exports of 19 per cent per annum over the same period (with 1986 estimated on the basis of first half-year performance).

d/ The reason for the discrepancy between the totals in this table and those in other tables has not yet been ascertained.

SOURCE: Basic values of exports from HASAN RPZ Administration Office.

experience of the Republic of Korea as a whole where the US market predominates:^{26/}

Per cent of total exports of the Republic of Korea

consigned to	1978	1980	1982	1984	1985
USA	31.9	26.3	28.6	35.8	35.5
Japan	20.7	17.4	15.5	15.7	15.0

For Masan, too, it appears that the Japanese market has been growing much more rapidly than that of the United States; whilst the volume of exports to Japan grew at 10.5 per cent per annum 1978-86 the U.S. market grew at less than 1 per cent per annum.

One other point from the table is worthy of note: despite the preponderance of the Japanese and U.S. markets, Masan exports to between 50 and 60 countries altogether.

Table 21 is inserted to round out the export picture of Masan and Iri with some recent statistics on planned and actual exports, sector by sector. A number of interesting observations can be made:

- In total, only 42 per cent of the year 1986's target had been achieved by Masan and Iri combined by the end of June 1986 (it is not known whether this is typical and whether second-half-of-year growth rates are usually greater than the first so as to achieve the target).
- Compared with the same period in 1985 exports are higher by 9 per cent in Masan, 26 per cent in Iri and 10 per cent overall.
- Masan shows a dramatic increase of 49 per cent in value of exports of machinery, comparing the two half-year periods. Iri's best performing sector (apart from "others") is the "metals" category, with a 59 per cent export improvement in the first half of 1986 over the same period 1985.

^{26/} Statistics from EPB, 1986, pp. 10-12, p.243.

Table 21. Mesan and Iri EPZs: Exports by commodity, 1985 planned and January-June 1986 achieved, and comparison of 1986 with 1985
 \$ million and per cent

	Planned for year 1986			Achieved in 6 months January - June 1986			Proportion of 1986 planned target achieved in 6 months Jan. - June 1986						Jan-June 1986 achievement as proportion of January- June 1985 achievement		
	Mesan EPZ	Iri EPZ	Mesan EPZ & Iri EPZ	Mesan EPZ	Iri EPZ	Mesan EPZ & Iri EPZ	Mesan EPZ	Iri EPZ	Mesan EPZ & Iri EPZ	Mesan EPZ	Iri EPZ	Mesan EPZ & Iri EPZ	Mesan EPZ	Iri EPZ	Mesan EPZ & Iri EPZ
	\$ million														
	Per cent														
Electric and electronic g/	540.0	30.5	550.5	226.8	4.5	231.3	42.0	42.9	42.0	98.8	114.7	99.1			
Metals	79.0	1.9	80.9	34.1	0.9	35.0	43.2	47.4	43.3	127.8	159.4	128.7			
Non-ferrous metals	4.0	n.a.	4.0	1.0	n.a.	1.0	25.0	n.a.	25.0	109.3	n.a.	109.3			
Machinery	23.0	n.a.	23.0	11.8	n.a.	11.8	51.1	n.a.	51.3	148.6	n.a.	148.6			
Precision machinery	130.0	n.a.	130.0	55.5	n.a.	55.5	42.7	n.a.	42.7	128.0	n.a.	128.0			
Textiles and handicrafts b/	30.0	55.7	85.7	7.4	27.2	35.6	28.8	48.8	41.5	109.1	141.8	131.4			
Footwear	48.0	n.a.	49.0	20.8	n.a.	20.8	42.5	n.a.	42.4	159.9	n.a.	159.9			
Leather	n.a.	18.7	18.7	n.a.	5.7	5.7	n.a.	30.5	30.5	n.a.	82.9	82.9			
Stone processing	n.a.	2.9	2.9	n.a.	1.1	1.1	n.a.	37.9	37.9	n.a.	124.6	124.6			
Others	25.0	0.4	25.4	11.0	0.4	11.4	43.9	100.0	44.9	113.9	207.9	114.0			
Total	880.0	90.0	970.0	369.6	39.7	409.3	42.0	44.1	42.2	108.9	125.9	110.4			

g/ Electric only in the case of Iri.

b/ Textiles only in the case of Iri.

Source: Administration offices of Mesan and Iri EPZs.

2.4 Value added and profitability

Table 16, which included data on value added and profitability for Masan, has already been discussed. However, Tables 22-24 return to the topics in more detail and relate Masan to the Republic of Korea.

First of all, value added: Table 22 calculates value added per employee in Masan and the Republic of Korea for 1980 and 1982. It appears that whilst Masan employs just over 1 per cent of the total employees in manufacturing in the Republic of Korea they produce less than half of one per cent of total Republic of Korea's value added in manufacturing. Consequently, the value added per employee in Masan was only 25 per cent of the country's average in 1980 and 29 per cent of the 1982 country average. This measure, of course, may also be construed as a measure of relative productivities. In the absence of evidence regarding lower skill etc. of the Masan labor force than that of the nation as a whole (and there probably is no major difference) the conclusion is unassailable: Masan has an industry-mix which is more oriented towards low value-added industries than the Republic of Korea as a whole.

Table 23, dealing with the Republic of Korea, has been calculated so that its figures on profitability^{27/} of foreign investment can be fed into Table 24. The objective is to compare the profitability of capital^{28/} in Masan with the profitability of foreign capital in the Republic of Korea.

Thus, turning to Table 24, we find that Masan's profit rate (i.e. profits in relation to total investment) varied from -6.7 per cent in 1978 to 23.2 per cent in 1985.

Some credence is given to the poor 1978 performance figure by the following statement of the Director-General, Industrial Policy Bureau of the Ministry of Trade and Industry:

^{27/} "Profitability" in Tables 23 and 24 relates to capital investment. Note that in Table 16 (for Masan) and Table 17 (for Iri) "profitability" was related to exports.

^{28/} 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.

Table 22. Nasan EPZ: Value added per person employed, compared with Republic of Korea's manufacturing, 1982

	Nasan EPZ		Republic of Korea		Nasan EPZ as proportion of Republic of Korea (per cent)	
	1980	1982	1980	1982	1980	1982
Employment (Number)	28,532	26,012	2,014,751	2,098,787	1.4	1.2
Value added (\$ million)	64.0	84.1	17,967	23,111	0.4	0.4
Value added/employee (\$)	2,243	3,233	8,918	11,012	25.2	29.4

Sources: Nasan EPZ: Administration office and table 16.
 Republic of Korea: 1982 Manufacturing Survey in Bank of Korea, Economics Statistics Yearbook 1986, Table 85, p.153.
 1980 Manufacturing Survey in Bank of Korea, ibid. 1983, Table 104, p.171.

Table 23. 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)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			\$ million				per cent
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 ^{a/}	1,196.7	66.0	33.2	99.2	8.3
1983	1,704.2	239.7 ^{a/}	1,464.5	94.5	47.6	142.1	9.7
1984	2,123.2	239.7 ^{a/}	1,883.5	85.3	42.9	128.2	6.8

^{a/} 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.

Table 24. Relationship between profitability in Masan EPZ and all Republic of Korea foreign investment, 1971-1984

\$ million and per cent

	<u>Masan EPZ</u>		<u>Ratio of profits to</u>		<u>Ratio of Masan EPZ profits rate to Rep. of Korea profits rate</u>
	<u>Total investment^{a/}</u>	<u>Profits^{b/}</u>	<u>Total investment Masan EPZ</u>	<u>Total direct foreign investment Rep. of Korea^{c/}</u>	
	\$ 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	..	..

a/ Includes foreign and domestic.

b/ Implicity includes royalties.

c/ Explicity includes royalties in definition of profits.

sources: Masan EPZ: Tables 12 and 16.

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, University of Wisconsin Press, Madison, 1985.

Republic of Korea 1978-1984: Calculated in Table 23. Note the break in the series in 1978.

"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." (Kim, Jong Nam, 1983, p.24).

It seems on the whole, however, that profitability, apart from a few bad years, has shown a moderately upward trend.

Finally, it is interesting to compare the Masan profitability rate with that of the Republic of Korea. The last column of Table 24 indicates that if we ignore 1972, when Masan was very newly-established, the Zone has experienced five years when its profit performance outshone the Republic of Korea and seven years when its performance was worse than the Republic of Korea. Rough inspection of the data does not seem to reveal any regular pattern of interrelationships.

2.5 Employment and wages

Tables 24-27 look in some depth at employment in Masan and Iri compared with the Republic of Korea. Some of the conclusions which may be drawn are as follows:

- Masan and Iri together have never absorbed more than about one quarter of one per cent of total employment in all industries (which definition includes agriculture, forestry and fishing). A peak was reached in 1977 since when the trend has been downwards.
- As a proportion of manufacturing employment only, the Zones reached a peak of 1.2 per cent in 1973 (when, in fact, only Masan was operating) since when there has been a more-or-less steady decline to the 0.94 per cent of 1985.
- 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). But it is interesting to note that 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. The corollary, that male employment has increased from 10 to 23 per cent, is an indication of growing capital and skill intensity in the Zone.

Table 25. Number of employees: Masan and Iri EPZs and Republic of Korea

	Masan EPZ			Iri EPZ			Masan EPZ + Iri EPZ			Republic of Korea		Masan + Iri EPZs as proportion of Republic of Korea	
	Male	Female	Total	Male	Female	Total	Male	Female	Total	All industries	Manufacturing	All industries	Manufacturing
										Total	Total	Per cent	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 ^{b/}	22.9	11,830	2,205	0.19	1.04
1976	7.2	22.8	30.0	..	..	1.2	7.2	22.8 ^{b/}	31.2	12,556	2,678	0.25	1.17
1977	7.8	22.9	30.9	..	..	2.3	7.8	22.9 ^{b/}	33.0	12,929	2,798	0.26	1.18
1978	7.7	23.3	31.0	..	..	3.0	7.7	23.3 ^{b/}	34.0	13,490	3,016	0.25	1.13
1979	7.9	23.3	31.2	..	..	2.8	7.9	23.3 ^{b/}	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
1986 ^{a/}	7.0	24.7	31.7	1.0	3.4	4.4	8.0	28.1	36.1	..	..	..	..

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

^{b/} Masan EPZ only.

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.

Table 26. Sex distribution of employment: Masan and Iri EPZs and Republic of Korea, 1975-1985

	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.)

Table 27. Employment in foreign-owned firms and joint ventures in Masan and Iri EPZs in relation to total Republic of Korea employment and employment in foreign firms in Republic of Korea

In '000 and percent

	Unit	1974	1975	1976	1977	1978
1. Employment in Masan EPZ	'000	20,822	27,986	29,953	30,719	30,960
2. Employment in foreign-owned firms or joint ventures in Masan EPZ ^{a/}	'000	19,781	21,457	28,453	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 ^{b/}	'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	29,072	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

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.

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.

Note: It did not prove feasible to construct this table with consistent numbers of decimal places, etc.

- But the most dramatic illustration of the nature of the economic activities conducted in the Zones compared with the Republic of Korea and hence the relatively low productivity in the Zones^{29/} - is provided by comparing the female employment rate in the nation with that of the Zones. 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.
- If we look more closely at employment in foreign firms in the Zones and in the Republic of Korea (Table 27) we come to the interesting conclusion that the EPZs loom much larger than is suggested by the previous figures. If we include joint-ventures as "foreign firms" in Masan and Iri we find that they employed 13.1 per cent of workers in Republic of Korea manufacturing industry in 1974. Even by 1978 it was still 10.8 per cent.

The wages^{30/} picture is looked at in Tables 28-30 and again the basic thrust is to compare the EPZs with the Republic of Korea as a whole. The main points will be dealt with in synoptic fashion:

- The easiest macro-economic approach to adopt is to calculate the average wage per person employed (strictly, the "average wage cost") in the Zones and to compare it with the similar statistic for the Republic of Korea. This has been done only for Masan, in Table 28. 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, Republic of Korea 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: Republic of Korea ratio ranged from 64 to 97 per cent - with a downward relative tendency over the whole period.
- However, in the last two or three years the statistics in Table 28 show a rise in the Masan/Republic of Korea ratio. This is confirmed by Tables 29 and 30 which, besides comparing wages on a sectoral basis between Masan and Republic of Korea, gives estimated total wage ratios. Thus Masan's wage, on the average, appears to have increased from 67 per cent of the Republic of Korea average in manufacturing in 1984 to 82 per cent in 1986. (This seems to be consistent with the trend revealed in Table 28, although it is not possible to include a Republic of Korea figure in that Table for 1986.)
- The low Masan/Republic of Korea ratios of wages in various sectors in 1984 is surprising. And even two years later only "Metals", "Footwear" and "Others" showed higher wages in Masan than in the Republic of Korea equivalent sectors. This result is in conflict with the generally accepted view that "wages are 10 per cent higher in Masan than outside" or that, as spokesmen of many Masan firms maintain, "wages are about the same in Masan as in the Republic of

^{29/} See 2.4.

^{30/} The term "wages" essentially means "earnings" in the Republic of Korea.

Table 28. Wages^{a/} in Masan EPZ 1971 to 1986 (June) and in Republic of Korea's Manufacturing, 1971-1985

	Masan EPZ		Korea manufacturing				Masan EPZ annual wage as proportion of Republic of Korea manufacturing annual wage (per cent) (3)/(6)	
	Total employment (1)	Total wage cost (\$ '000) (2)	Average wage per person employed					
			Per annum (\$) (3)	Per month (A) (\$) (4)	Per month (B) (\$) (5)	Per annum (\$) (6)		Per month (\$) (7)
1971	1,248	157	(126) _{c/}	(10) _{c/}	..	560	47	..
1972	7,106	1,395	(196) _{c/}	(16) _{c/}	..	569	47	..
1973	21,240	8,420	(396) _{c/}	(33) _{c/}	..	674	56	..
1974	20,822	18,090	869	72	59	749	62	116.0
1975	22,586	20,772	920	77	82	952	79	96.6
1976	29,953	30,035	1,003	84	99	1,281	107	78.3
1977	30,719	40,083	1,305	109	127	1,715	143	76.1
1978	30,960	49,851	1,610	134	151	2,303	192	69.9
1979	31,153	65,521	2,103	175	182	2,963	247	71.0
1980	28,532	56,732	1,988	166	..	2,667	222	74.5
1981	28,016	58,377	2,084	174	..	3,018	252	69.1
1982	26,012	60,991	2,345	195	..	3,239	270	72.4
1983	30,989	67,847	2,189	182	..	3,421	285	64.0
1984	33,858	80,049	2,364	197	..	3,557	296	66.5
1985	28,983	79,582	2,746	229	..	3,635	303	75.5
1986 June	31,666	94,124 _{b/}	2,972	248	..	..	..	..

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.

Sources: Masan employment and total wage cost: Administration Office, Masan EPZ.

Average wage per month (B): A. Basile and D. Germidis, Investing in Free Export Processing Zones, OECD Development Centre Studies, Paris, 1984, Table 6, p.34.

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.)

Note: The only available statistics on wages from Masan EPZ Administration are as follows. The series was

discontinued after 1982.

(\$ per month)

	1974	1975	1976	1977	1978	1979	1980	1981	1982
Males	71	99	117	151	195	236	287	331	350
Females	32	46	56	70	79	98	120	144	143
Average	42	59	70	90	107	133	157	184	191

Source: Masan EPZ, Facts and figures on MAFEZ (1982), Table F, p.19.

Table 29. Masan EPZ monthly wage^{a/} compared with monthly wage^{a/} in Republic of Korea manufacturing (A), 1984

Masan EPZ designation	ISIC classification b/	Masan EPZ			Republic of Korea			Masan EPZ as proportion of Rep. of Korea		
		Male	Female	Total \$	Male	Female	Total	Male	Female	Total (Per cent)
Electronic & electrical Machinery	383	427	156	195	402	194	293	106.2	80.4	66.6
Precision machinery	382	233	167	210	384	200	361	60.7	83.5	58.2
Textiles and handicrafts	385	294	162	199	329	190	260	89.4	85.3	76.5
Footwear	321)	295	143	173	356	172	236	82.9	83.1	73.3
Others	322)				296	169	200			
	324	261	150	181	271	175	211	96.3	85.7	85.8
	390	316	163	225	277	169	220	114.1	96.4	102.3
Total^{c/}		341	156	197	..	..	296	..	..	(66.6)

a/ "Wage" is to be interpreted as "earnings".

b/ ISIC as given in ILO Yearbook of Labor Statistics 1985, p.905, as follows:

321 Manufacture of textiles

322 Manufacture of wearing apparel, except footwear.

324 Manufacture of footwear, except vulcanised or moulded rubber or plastic footwear.

382 Manufacture of machinery except electrical.

383 Manufacture of electrical machinery apparatus, appliances and supplies.

385 Manufacture of professional and scientific and measuring and controlling equipment n.e.c., and of photographic and optical goods.

390 Other manufacturing industries.

c/ Total of industries listed, plus metals and non-ferrous for Masan EPZ; total of manufacturing for Korea (hence the brackets around the total of 66.6 per cent).

Sources: Masan EPZ: The figure for June 1986, from Masan EPZ Administration office, was used as the base. The 1984 figure was estimated from this.

Republic of Korea: ILO Yearbook of Labor Statistics 1985, Table 17, pp.672-673. (Not all the categories quoted for Masan EPZ are specified in the ILO Statistics.) (For "total manufacturing" source was: "Monthly Earnings and man-days of regular employees by industry", Table 34, from EPB, Monthly Statistics of Korea, 5, 1986.)

Note: All the original figures in won have been converted to \$ on the basis of the 1984 exchange

c/ Total of industries listed, plus metals and non-ferrous for Masan EPZ; total of manufacturing for Korea (hence the brackets around the total of 66.6 per cent).

Sources: Masan EPZ: The figure for June 1986, from Masan EPZ Administration office, was used as the base. The 1984 figure was estimated from this.

Republic of Korea: ILO Yearbook of Labor Statistics 1985, Table 17, pp.672-673. (Not all the categories quoted for Masan EPZ are specified in the ILO Statistics.) (For "total manufacturing" source was: "Monthly Earnings and man-days of regular employees by industry", Table 34, from EPB, Monthly Statistics of Korea, 5, 1986.)

Note: All the original figures in won have been converted to \$ on the basis of the 1984 exchange rate of W827.4.

Table 30. Masan EPZ Monthly wage^{a/} compared with monthly wage in Republic of Korea's manufacturing (B), June 1986

Masan EPZ designation	Republic of Korea designation	Masan EPZ (\$)	Republic of Korea (\$)	Masan EPZ as proportion of Rep. of Korea (per cent)
Electronic and electrical	Electrical and electronic machinery	246	292	84.2
Metals		328	309	106.1
Non-metal mineral products	Non-metallic mineral products	297	313	89.1
Machinery	Machinery except electrical	264	360	73.3
Precision machinery	Scientific measuring and controlling equipment	250	300	83.3
Textiles and handicrafts	Textiles	218	260	83.8
Footwear	Footwear	228	221	103.2
Others	Others	283	238	118.9
Total^{b/}		248	302	(82.1)

a/ "wage" is to be interpreted as "Earnings".

b/ For Masan EPZ "total" refers to the sectors listed; for Republic of Korea, "total" refers to total of manufacturing, (hence the brackets around the total of 82.1 per cent).

Sources: Masan EPZ: Administration Office.

Republic of Korea: June 1986 estimated on the basis of the trend February 1985 to February 1986 in EPB Monthly Statistics of Korea, 5, 1986, Table 34, "Monthly Earnings and man days of regular employees by industry".

Korea generally". Nevertheless, such statements as those quoted are never backed up with evidence; the objective in constructing Tables 28-30 was to do precisely that.

2.6 Material inputs: imported and domestic

"Despite the fact that the government took measures to try to induce exporters to increase their utilization of domestically produced inputs, there seems to be little doubt that imports for export rose even more rapidly than exports, at least until 1970". (Krueger, 1979, p.137)

It would seem that that the government subsequently had rather more success in Masan and Iri with regard to stimulating domestic input usage than it had had with the economy as a whole. Tables 31-34 provide some of the data on which this conclusion is based.

From Table 31 we see that, in the case of Masan, exports rose by 16.6 per cent per annum whilst imports of materials rose by 14.8 per cent per annum. In Iri's case the result was not so favourable - approximately equal growth rates of exports and material imports (20.5 per cent per annum and 21.0 per cent per annum, respectively).

However, growth rates do not tell the whole story. If we look at imports of materials as a proportion of exports we find a decided difference between Masan and Iri. In the case of the former, this proportion declined markedly from 67.8 per cent on the opening of the Zone to 46.1 per cent in 1985. But for Iri, the proportion rose from 45.3 per cent in 1976 to 59.6 per

Table 31. Masan and Iri EPZs: Relationship between imports of raw materials and exports

\$ million and per cent

	Masan EPZ							
	Exports	Total use of raw materials	Use of domestic raw materials	Imports of raw materials	Total use of raw materials as	Use of domestic raw materials as	Imports of raw materials as	Use of domestic raw materials as proportion of total use of raw materials
					(2)/(1)	(3)/(1)	(4)/(1)	(11)/(10)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	\$ million			Proportion of exports			Per cent	
1971	0.9	0.6	0.02	0.58	66.7	2.2	67.8 _a /	3.3
1972	9.7	6.7	0.4	6.3	69.1	4.1	64.9	6.0
1973	70.4	48.6	11.2	37.4	69.0	15.9	53.1	23.0
1974	181.5	125.2	27.6	97.6	69.0	15.2	53.8	22.0
1975	174.8	124.1	30.3	93.8	71.0	17.3	53.7	24.4
1976	303.0	212.5	63.7	148.8	70.1	21.0	49.1	30.0
1977	367.9	266.2	88.9	177.3	72.3	24.2	48.2	33.4
1978	484.8	350.1	108.8	241.3	72.2	22.4	49.8	31.1
1979	600.6	427.3	144.3	283.0	71.1	24.0	47.1	33.8
1980	628.1	432.5	142.9	289.6	68.9	22.8	46.1	33.0
1981	696.3	461.0	150.9	310.1	66.2	21.7	44.5	32.7
1982	601.3	398.4	142.7	255.7	66.3	23.7	42.5	35.8
1983	706.5	473.0	155.6	317.5	66.9	22.0	44.9	32.9
1984	878.6	623.9	196.1	427.8	71.0	22.3	48.7	31.4
1985	809.3	550.7	177.9	372.8	68.0	22.0	46.1	32.3
1986 (first half)	..	322.7	108.2	214.4	..	..	..	33.5
Growth rate 1975-1985 _b / per cent per annum	16.6	16.1	19.4	14.8				

Notes and Sources: Below continuation of Table on following page.

Table 31 (continued). Nasan and Iri EPZs: Relationship between imports of raw materials and exports

\$ million and per cent

	Iri EPZ							
	Exports	Total use of raw materials	Use of domestic raw materials	Imports of raw materials	Total use of raw materials as	Use of domestic raw materials as	Imports of raw materials as	Use of domestic raw materials as proportion of total use of raw materials
	(9)	(11)+(12) \$ million	(11)	(12)	(10)/(9)	(11)/(9)	(12)/(9)	(11)/(10)
		(10)	(11)	(12)	(13)	(14)	(15)	(16)
1971	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1972	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1973	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1974	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1975	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1976	5.3	..	..	2.4	..	..	45.3	..
1977	18.6	18.3	8.6	9.7	98.4	46.2	52.2	47.0
1978	33.7	..	..	15.2	..	..	45.1	..
1979	42.5	33.9	9.7	24.2	79.8	22.8	56.9	28.6
1980	46.1	..	..	25.8	..	..	56.0	..
1981	53.4	40.8	11.5	29.3	76.4	21.5	54.9	28.2
1982	57.2	43.3	10.6	32.7	75.7	18.5	57.2	24.5
1983	62.0	55.7	19.4	36.3	89.8	31.3	58.5	34.8
1984	74.8	63.1	22.4	40.7	84.4	29.9	54.4	35.5
1985	80.5	67.4	22.9	44.5	83.7	28.4	55.3	34.0
1986 (first half)	50.2	..	..	29.9	..	..	59.6	..
Growth rate 1975-1985 ^{b/} per cent per annum	20.5	17.7	13.0	21.0				

a/ Using unrounded figures.

b/ For Iri, 1977-1985.

Sources: Nasan EPZ: Table 16.
Iri EPZ: Administration office.

1986 50.2 29.9 29.8 ..

Growth rate
1975-1985^{b/} 20.5 17.7 13.0 21.0
per cent
per annum

a/ Using unrounded figures.

b/ For Iri, 1977-1985.

Sources: Masan EPZ: Table 16.
Iri EPZ: Administration office.

Note: The reason for the discrepancy between the 1985-1986 export/import statistics in this table and those of Table 32 has not yet been ascertained.

cent in the first half of 1986 (55.3 per cent in 1985).^{31/} Thus not only is the direction of change adverse to the domestic industry sector in Iri but as a proportion of exports the Iri import figure is higher than Masan's.

That still presents only a part of the picture; when we come to examine total input usage in each Zone compared with exports we are left with some disquieting feelings about Iri. For in this Zone's case total material inputs as a proportion of exports have been consistently higher, by a considerable

31/ The figures for import content in the text and in Table 31 may be compared with those for the total exports of the Republic of Korea. Frank, Kim and Westphal provide the following statistics for 1967/73:

	1967	1968	1969	1970	1971	1972	1973
All exports:	40.0%	43.7%	43.9%	44.3%	46.3%	36.3%	42.3%
Manufactured exports:	..	..	53.8%	..	..	..	..

The figures are for direct import content; they cite a 1969 study which suggests that for 1968 direct plus indirect import content of exports amounted to 44.4 per cent. The comment is made that the Republic of Korea's "exports are import intensive largely because of the particular products in question rather than because of the processes used to produce them". Not only are manufactured products more import intensive than primary products but manufactured exports are more import intensive than manufacturing production in general. These points, of course, are also pertinent to a discussion of the reasons for the high import content of Masan and Iri's exports. We can only compare Masan with the import content statistics given in this note, and then only for 1971-73: Table 31 shows the following proportions:

	1971	1972	1973
	67.8%	64.9%	53.1%

The conclusion may be drawn, therefore, that at least for these years the import content of Masan's exports was considerably higher than the import content of all Republic of Korea exports. However, the disparity is considerably lessened if we estimate the 1971-73 proportions for manufactured exports for Republic of Korea. Basing ourselves on the 1969 Republic of Korea all exports/manufactured exports ratio we might roughly calculate the Republic of Korea manufactured exports import/export proportions as follows:

	1971	1972	1973
	56.8	45.1	51.9

This procedure brings Masan closer to but still higher than the Republic of Korea import content ratio. (Frank, Kim and Westphal, 1975, p.82).

margin, than Masan's and, indeed, were 80 per cent or more for several years. This, of course means that value added has been relatively greater in Masan than in Iri.

Looking directly at the domestic/imported material inputs situation over the years in the two Zones we find a marked tendency in Masan to increase domestic content from negligible proportions on the inauguration of the Zone to some one third of total material usage in 1977. However this increasing proportion trend ceased in that year; in subsequent years the proportion has remained about the same. A trend is harder to discern in the Iri statistics; whilst for 1979, 1981 and 1982 the proportions were actually lower than in Masan, in more recent years the proportion has been similar (just over one third).

It has been possible to calculate the import export ratios for a number of different sectors in Masan and Iri. The results are shown in Table 32. The picture is clear: non-ferrous metal, precision machinery and electronic/electrical are the sectors with the highest ratios of imports to exports - 55 to 77 per cent. Footwear is a small user of imports (10 per cent of exports). In Iri, an even higher import ratio is shown for the electronic/electrical sector, 70 per cent. An interesting point emerges about the textiles/handicrafts sector: in Masan both are produced and the import ratio is 38 per cent; in Iri, where only textiles are produced, the import ratio is 70 per cent. The conclusion to be drawn, therefore, is that the handicrafts sector in Masan probably has a negligible import content.^{32/}

In Table 33 we give a detailed look at domestic raw material (which includes components) usage, sector by sector, from 1976 to 1985 for Masan. Unfortunately, no such sectoral breakdown is available for Iri. However, care must be exercised in interpreting the table. The percentages, sector by sector, refer not to the proportion of domestic materials in total material usage by the sector but merely to the distribution of total domestic inputs among the sectors. Note also that there is a break in the series in 1981, which is an overlapping year.

^{32/} However, some confusion is caused by the Masan's sector being titled in English variously "Textiles and Garments" and "Textiles and Handicrafts".

Table 32. Masan and Iri EPZs: Relationship between exports and imports of materials, commodity by commodity, 1985/86

\$ million and per cent

Sector	Masan EPZ 1985			Iri EPZ 1986 (Jan - May)		
	Exports	Imports	Import ratio (2)/(1)	Exports	Imports	Import ratio (5)/(4)
	\$ million (1)	\$ million (2)	Per cent (3)	\$ million (4)	\$ million (5)	Per cent (6)
Electronic/electrical ^{a/}	521.3	260.0	49.9	4.5	3.1	69.6
Metals	64.3	13.2	20.5	0.9	0	-
Non-ferrous metal	3.0	2.3	76.7	n.a.	n.a.	n.a.
Machinery	21.8	10.9	50.0	n.a.	n.a.	n.a.
Precision machinery	115.6	69.3	59.9	n.a.	n.a.	n.a.
Textiles and handicrafts ^{b/}	22.4	8.5	37.9	27.2	19.1	70.3
Footwear	36.4	3.6	9.9	n.a.	n.a.	n.a.
Leather	n.a.	n.a.	n.a.	5.7	2.5	44.3
Stone processing	n.a.	n.a.	n.a.	1.1	0.2	16.2
Others	24.5	8.9	36.3	0.4	0	-
Total	809.3	372.8	46.1	39.7	24.9	62.8

^{a/} In Iri EPZ, Electrical only.

^{b/} In Iri EPZ, Textiles only.

Sources: Masan EPZ and Iri EPZ Administration offices and MTI.
Masan imports calculated from Table 34.

TABLE 33

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From Table 33 we conclude, for instance, that

- domestic raw material usage in the electronic and electrical sector has increased by 178 per cent between 1976 and 1985 in current value terms. However, if deflated by an index of wholesale prices the increase, in constant 1980 prices, works out at only 7.9 per cent - a real rate of increase of only 0.9 per cent per annum.
- for domestic material input as a whole the increase, in current value terms, is 179 per cent. However, after deflating, this comes down to 8.5 per cent in real terms over the period - an increase of about 1 per cent per annum.
- the electronic and electrical sector in 1976 absorbed 58 per cent of total domestic material usage in Masan; by 1985 it was still absorbing the highest proportion - 60 per cent.
- the metals sector expanded its usage of domestic materials relatively rapidly. In 1976 it used only 8 per cent of Masan's total domestic materials usage; by 1985 the proportion was 17 per cent, the next highest to the electronic and electrical sector.
- the precision machinery sector is particularly interesting to examine since it indicates the extent to which this high-skill sector is able to count upon local inputs. From 1976 to 1980 the sector did not even appear as a separate category; it was included in "machinery". Presumably its growing importance was one of the reasons for re-classifying industries in 1981. The first year for which we find statistics for precision machinery (1981) its domestic material input already represented 7 per cent of Masan's total domestic material inputs. The whole machinery sector five years previously had only absorbed 3 per cent of total domestic materials. But since 1981 the sector has not greatly increased its relative position, although it did increase its usage of domestic materials by 35 per cent (27 per cent in real terms) 1981 to 1985.

Domestic raw material usage for Masan, sector by sector for 1980 and for 1983-1985 is presented in Table 34. The figures are not entirely clear for 1980 (partly due to the classification of sectors in 1981) but we may note immediately that relative to all material usage in the electronic and electrical sector domestic material usage by that sector has declined (from 33 per cent to 29 per cent).

Precision machinery is again worthy of comment: between 1980^{33/} and 1985 this sector increased its local materials from 9 per cent of its total material input to 16 per cent.

33/ Warr (1984, p.175) was able to give the percentage domestic material figure for that year - presumably privately supplied.

Table 34. Massa RPZ: Domestic raw materials usage in relation to total raw materials usage by sector 1980 and 1983-1985

Sector	1980			1983			1984			1985		
	Raw material usage									Total	Domestic	Domestic as proportion of total
	Total	Domestic	Domestic as proportion of total	Total	Domestic	Domestic as proportion of total	Total	Domestic	Domestic as proportion of total			
	\$ million		Per cent	\$ million		Per cent	\$ million		Per cent	\$ million		Per cent
Electronic and electrical	278.2	91.8	33.0	300.0	87.0	29.0	404.5	117.3	29.0	366.2	106.2	29.0
Metals	33.0	13.2	40.0	42.9	27.9	65.0	52.1	31.8	61.0	42.6	29.4	69.0
Non-ferrous metals				1.5	0.3	19.0	1.7	0.3	18.0	2.5	0.2	8.0
Machinery	46.7	(4.2)	..	9.1	3.9	43.0	12.6	4.4	35.0	16.5	5.6	34.0
Precision machinery			9.0	77.3	8.5	11.0	91.9	14.7	16.0	82.5	13.2	16.0
Textiles and garments	8.2	2.7	33.0	17.4	5.4	31.0	20.0	3.8	19.0	13.5	5.0	37.0
Footwear	28.6	20.0	70.0	22.9	17.2	75.0	21.2	17.2	81.0	15.8	12.2	77.0
Other	37.6	10.9	29.0	17.4	5.4	31.0	15.7	6.6	42.0	15.1	6.2	41.0
Total	432.5 g/	142.9	33.0	477.0 g/	155.6	32.9	623.9 g/	196.1	31.4	550.7 g/	177.9	32.3

g/ The proportions of domestic to total material usage have been rounded so drastically by the Massa administration that the calculation of accurate sectoral total material usage is impossible; hence the discrepancy in the totals which have been taken from Table 31.

Sources: 1980: Warr, 1984, p.175.

1983-1985: Domestic and domestic as proportion of total: Table 33.

Total material usage in each sector: Derived from other two columns.