Export Processing Zones: The Economics of Offshore Manufacturing

Peter G. Warr (Consultant)
August 1987
<table>
<thead>
<tr>
<th>Report No.</th>
<th>Title, Author and Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDP-3</td>
<td>&quot;An Analysis of the Sources of Earnings Variation Among Brazilian Males&quot; by Marcelo Dabos and George Psacharopoulos, December 1987</td>
</tr>
<tr>
<td>IDP-4</td>
<td>&quot;The Efficiency and Effectiveness of Export Credit and Export Credit Insurance Programs&quot; by Bruce Fitzgerald and Terry Monson (Consultant), December 1987</td>
</tr>
<tr>
<td>IDP-10</td>
<td>&quot;Dumping, Anti-dumping and Efficiency&quot; by Bruce Yandle and Elizabeth M. Young (Consultants), August 1987</td>
</tr>
</tbody>
</table>
Executive Summary

EXPORT PROCESSING ZONES

1. EPZs are vehicles for attracting foreign investment in export-oriented, light manufacturing. At the time the zones were becoming popular, in the early 1970s, the governments establishing them almost invariably mentioned three objectives for the zones: foreign exchange earnings, employment, and technology transfer. The competition among host countries for "footloose" processing activities meant that individual countries generally found it more difficult than they had expected to attract this kind of investment.

2. The EPZs are generally isolated from the domestic economy. The substantial gains from "technology transfer" that were initially sought do not seem to have occurred.

3. EPZ firms have made little contribution to tax revenue. This has been equally true in countries which have granted company income tax holidays and countries which have not.

4. The benefits from EPZs are limited. They are definitely not "engines of development". For countries in the early stages of development, the zones can provide an efficient and productive means of absorbing surplus labor. Even then, the zones could never be expected to provide more than a modest part of the solution to the employment problems of these countries.

5. Finally, it must be stressed that the success of the liberal economic environment existing within EPZs says a great deal about the nature of the economic environment existing outside the zones in the countries establishing them. In cases where EPZs have been successful in attracting new foreign investment, earning foreign exchange, generating employment, etc., two kinds of lessons can be drawn. Within a partial context, something is revealed about the utility of the export processing zone concept itself: EPZs can make a limited contribution to economic development, especially in the early stages of industrialization.
1. INTRODUCTION: EXPORT PROCESSING ZONES AND ECONOMIC WELFARE

1. Since the mid 1960s, many less developed countries (LDCs) have initiated special policies designed to stimulate exports of non-traditional manufactured goods. One form this "export promotion" effort has taken is the establishment of export processing zones (EPZs). Many of these zones were constructed in the early 1970s and by the early 1980s around 35 such zones existed in Asia alone, with an aggregate employment of at last a quarter of a million (United Nations, 1985). Globally, their importance was probably more than double this.

2. EPZs are special enclaves outside a nation's normal customs barriers within which investing firms (mostly but not entirely foreign) enjoy favored treatment with respect to imports of intermediate goods, company taxation, provision of infrastructure, and freedom from industrial regulations applying elsewhere in the country. The details of these provisions vary across countries but a universal feature is the almost complete absence of either taxation or regulation of imports of intermediate goods into the zones. These privileges are subject to the conditions that all (or almost all) of the output produced is exported and that all imported intermediate goods are either utilized fully within the zones or re-exported.

3. This study focusses upon the economic benefits and costs of establishing an export processing zone. Our frame of reference is the economic welfare of citizens of the country establishing the zone.
Clarification of the welfare effects of EPZs is important because despite the large public investment required to establish an EPZ, perusal of the government documents accompanying decisions to do so invariably reveals confusion about the economic effects that can be expected and of their welfare significance. Much of this confusion is also present in the economic literature dealing with EPZs. The present study aims to clarify these matters with the aid of a theoretical analysis illustrated by case studies drawn from four East Asian countries. In the course of this discussion the study aims to draw out the crucial relationship between the economic effects of EPZs and the overall trading regime of the country establishing them.

4. The economic activities occurring within EPZs have primarily been labor-intensive light manufacturing processes such as garment production, electronics assembly, assembly of light electrical goods, etc. A notable feature of the firms producing within the zones is their international mobility. The rate of turnover of firms within the EPZs is high and firms leaving an EPZ in one country are often migrating to an EPZ in another, in which conditions are somewhat more favorable.

5. The "footloose" character of the firms producing within EPZs - their international mobility and their capacity to adjust output rapidly in response to changing conditions - has been overlooked in most of the small amount of theoretical work that has appeared on EPZs. This literature has drawn upon the classical Heckscher-Ohlin model of production for analyzing the impact of EPZs. \(1/\) Insofar as this analysis treats capital as being

---

internationally immobile, it fails to capture the international mobility of capital goods that is central to the functioning of EPZs. The conclusion of most of this literature is that EPZs are necessarily welfare-reducing for the countries establishing them, but this conclusion is misleading. It is heavily dependent on the Heckscher-Ohlin framework being used and is thus largely irrelevant for EPZs as they actually operate.

6. Empirical work on EPZs has also tended to overlook the footloose character of the EPZ firms. For example, in an otherwise useful descriptive study of EPZs, Spinanger writes that the establishment of EPZs tends to produce positive welfare effects analogous to those resulting from a movement towards free trade because the elimination of tariffs and other distortions causes factor intensities of production "to correspond more closely with the factor endowment of the host country". This conception of the EPZ also rests on the traditional presumption that capital is internationally immobile. It assumes implicitly that the capital used in the EPZ is domestic capital in fixed total supply, which has moved to the EPZ from elsewhere within the host country. Once this assumption is discarded it is seen that the preoccupation with the factor intensity of production within EPZs, found in much of the empirical literature on the zones, is of limited relevance for an assessment of the welfare impact of the zones.

7. The question of whether the establishment of an EPZ raises or lowers economic welfare in the host country has been central to most of the economic literature on the zones. Most studies have stopped short of formal benefit-cost analysis, with the explanation that the data on the zones under

2/ Spinanger (1985, p. 65).
study are inadequate for the purpose. In fact, ample data can be obtained on the exports, imports, employment, use of utilities and other aspects of the economic performance of EPZs, along with their infrastructure costs, administrative costs, etc. The zones are closely monitored by the host governments and, when compared with the data available for other public projects in LDCs, the statistical information available on EPZs is unusually detailed and complete. What the empirical studies have most lacked has not been data, but an analytical framework within which the benefits and costs of EPZs can be identified conceptually and then quantified empirically.

8. In this study, we begin in Section 2 with some elaboration of the footloose character of the EPZ firms and its implications for our understanding of the EPZs. In Section 3 we provide a brief description of the incentive package and other facilities provided in the "typical" EPZ. Section 4 describes the economic performance of EPZs in four Asian countries: Indonesia, Korea, Malaysia, and the Philippines. Section 5 introduces a simple conceptual framework - the "enclave model" - within which the benefits and costs of an EPZ can be analyzed, and discusses the various components of such an analysis. This model is then applied in Section 6, which presents the results of detailed benefit-cost analyses of the above four EPZs. Finally, Section 7 discusses the relationship between EPZs and trade policy in general.

2. THE ECONOMICS OF THE FOOTLOOSE MANUFACTURER

9. In its standard forms, international trade theory treats "factors of production" - capital, labor, land - as immobile internationally but
mobile domestically. In contrast, final commodities are considered mobile across as well as within international boundaries. Export processing zones illustrate well the fact that some factors of production are also mobile internationally. This is especially true of the capital goods owned by internationally "footloose" manufacturing firms. Export processing zones are essentially devices for attracting these firms and their capital equipment into the host country. Within the EPZs, these internationally footloose capital goods are combined with domestic labor - relatively immobile internationally - to produce traded goods which the firm sells abroad. The firm tries to move its capital equipment to those countries in which its capital goods can earn the highest rate of return.

10. In its most simplified form, this process can be viewed as an indirect form of labor export. The foreign firm producing within the EPZ receives the services of domestic labor in its manufacturing activity. In return, the domestic workers receive wages and some training. Indeed, it is probably no coincidence that many of the countries to have established EPZs have also been involved in the direct export of temporary labor to the Middle East and elsewhere. 3/ In the case of export processing zones, the capital goods move where the labor is; with direct labor export, the movements are reversed. Of course, the goods produced within EPZs must be internationally mobile - capable of being exported. No such restriction applies when the labor is exported directly - for example, "guest workers" are often employed in the construction sector.

3/ Examples in East and South-East Asia include Korea, the Philippines, Thailand and Indonesia.
11. A simple model to represent the international mobility of capital goods was recently developed by Jones (1980) and Caves and Jones (1985). We present an amended version of the Caves and Jones model to bring out the economic features which are most relevant for our understanding of EPZs.

12. The processing activity within the zone produces final traded goods using three kinds of inputs: traded intermediate inputs, capital goods, and labor. The traded intermediate inputs include the electronic components, plastic casings, electrical circuitry, etc., used in producing electronic goods, and the textiles, buttons, cotton thread, etc., used in producing garments. The prices of these goods, the wages paid, and the return to the capital goods used are formally related by

\[ \sum P_j = \sum a_{ij} P_i + \sum a_{kj} R_j + \sum a_{lj} w, \quad (1) \]

where \( P_j \) is the price of the final good \( j \), \( P_i \) is the price of intermediate input \( i \), \( a_{ij} \), \( a_{kj} \) and \( a_{lj} \) are the amounts of intermediate good \( i \), capital goods and labor, respectively, required to produce a unit of good \( j \), and \( w \) is the wage rate. These variables determine \( R_j \), the rate of return to capital goods resulting from the production of good \( j \) in this country's EPZ.

13. It is convenient to define the value-added generated per unit of production of good \( j \), \( V_j \), by writing

\[ \sum V_j = P_j - \sum a_{ij} P_i, \quad (2) \]

and (1) now becomes
\[ v_j = aK_j R_j + aL_j W_i. \]  \hspace{1cm} (3)

14. Figure 1 now represents equation (3) for each of two countries, labelled "poor" and "rich". In the rich country unit labour costs, \( aL_j W_i \), are higher, but unit requirements of capital goods, \( aK_j \), are lower than in the poor country. The rich country's schedule thus has a higher vertical intercept (unit labor costs) - i.e. point B lies above point C - and a lower slope (unit capital good requirement) than the poor country's.

15. The footloose manufacturer moves to the country where the highest value of \( R_j \) can be realized and this is represented by the shaded surface in the diagram. When unit value added is high, implying high rates of return to the capital goods specific to commodity \( j \), the rich country is able to attract the processing activity. This occurs because in the rich country the scarce capital goods are used more efficiently (unit capital good requirements per unit of output are lower); unit labor costs are in this case relatively unimportant. But if unit value added falls, implying a squeeze on returns to its commodity-specific capital goods, unit labour costs become relatively more important. Below point A the process migrates to the poor country.

16. This chain of events is consistent with the "product cycle" process identified by Vernon (1966). It suggests a gradual migration of newly-developed manufacturing processes from rich countries - where scarce capital goods are used more efficiently - to poor countries - where unit labor costs are lower - as international competition forces the unit value-added generated by these processes downwards.
3. THE ECONOMIC ENVIRONMENT OF THE EPZ

3.1 The Economic Background

17. Japan's relaxation of restrictions on investment abroad by Japanese firms led in the early 1970's to competition among Asian countries hoping to attract these and similar foreign investments. Light manufacturing activities which are intensive in the use of unskilled and/or semi-skilled labor were identified as targets. These are activities in which low wage countries possess a potential cost advantage and are activities which are capable of being transported internationally at low cost. The "export processing zone" (EPZ) provided an economic environment especially designed to attract these "footloose" activities.

18. Most of the countries hoping to attract foreign investment of this kind already possessed protected manufacturing sectors and had experimented unsuccessfully with import substitution-based industrialization policies. It was becoming clear to governments as well as to others that these inward looking policies had inhibited the development of export-oriented manufacturing and had made it more difficult to attract export-oriented foreign investment. The potential gains from foreign exchange earnings and employment creation that a more export-oriented strategy could bring were being foregone. Nevertheless, the political power of groups benefitting from the protectionist domestic environment had become entrenched. This provided the second major attraction of the EPZ concept: it left the protection of domestic industries intact.

19. Export processing zones seemed to provide the opportunity for some of the advantages of export promotion to be realized without threatening the
position of the existing manufacturing sector. This was achieved by offering an economic environment to export-oriented firms which was free of many of the barriers to trade and industrial regulations characterizing the domestic environment of these countries, on condition that all the output of these firms was to be sold abroad. Production was to take place within enclaves designed, on the one hand, to attract export-oriented light manufacturing firms and, on the other, to shield domestic firms from competition.

3.2 Characteristics of EPZs

20. The detailed characteristics of EPZs vary from country to country, but four features are almost universal. The following account provides a simplified description of the "typical" export processing zone.

3.2.1 Duty-free Import of Raw Materials

21. All raw materials required for the production of exports may be imported duty-free and without regard to any quantitative restrictions applying within the domestic economy. The products may be exported without payment of export taxes, sales duties, etc. The EPZs may be physically located anywhere within the host country, but it is helpful to think of the processing activities undertaken within them as occurring "outside" the country insofar as the jurisdiction of normal customs provisions is concerned.

22. Goods produced within EPZs may not normally be sold within the domestic economy. Despite this, when consignments are rejected by foreign buyers, fail to meet delivery deadlines, etc., permission can be given for their domestic sale. In such cases, these sales are usually treated as
imports into the domestic economy and attract the normal customs duties applying to other imports. Sales of this kind simply displace imports which would otherwise have occurred from other sources.

23. In addition, EPZ firms' purchases of raw materials and intermediate goods from within the domestic economy frequently are subsidized. These subsidies, commonly called "rebates" or "drawbacks", are intended to counteract the effects of domestic protection on the prices of these goods. The rates of subsidy are in principle equal to the tax (import duty, excise tax, sales tax, etc.) component of the domestic prices of these goods. The subsidies are intended to encourage backward linkages between EPZ firms and the domestic economy. In the early 1970's it was hoped that linkages of this kind would generate substantial benefits to the local economy both because the social costs of producing these goods was below their market prices and also because commercial contact between domestic suppliers and EPZ firms would benefit the former through "technology transfer".

3.2.2 Company Income Tax Holidays

24. Exemptions from normal company income tax provisions are frequently offered. The exemptions are not permanent, with an official duration of from three to ten years, but it is common for EPZ firms to negotiate successfully for continuation of these tax holidays long beyond their official expiration. With some credibility, firms are able to claim that if the present host country does not extend the tax-free period the firm will simply relocate to an EPZ in another country. Once it has relocated, the firm's tax-free holiday begins again.
25. The Philippines does not offer company income tax holidays but offers a generous schedule of deductions. Very little tax revenue has been raised from the Philippines' EPZs because most firms declare overall trading losses. 4/ Many firms have declared losses every year for over a decade while still producing and, in some cases, expanding operations considerably. It is well understood that vertically integrated firms utilize transfer pricing to relocate their profits internationally. The minimization of global tax burdens and the avoidance of political risk are motives for this behavior. Experience in the Philippines suggests that check-pricing methods to monitor transfer pricing is ineffective. In short, tax holidays are less important than they may appear.

3.2.3 Streamlined Administration

26. EPZ firms are typically provided with streamlined customs documentation requirements for imported raw materials and capital goods and for exported final products. This is intended to expedite their clearance. It is also common for EPZ firms to be exempted from some regulations applying elsewhere within the local economy.

27. In most of the countries establishing EPZs, a separate branch of the administration has been created to handle these matters, its mandate being specifically to assist EPZ firms. Examples are the Philippines' Export

4/ For example, the proportions of firms in the Philippines' Bataan EPZ (discussed in Section 4, below) who declared overall trading losses in their annual financial statements were: 1980, 58 percent; 1981, 81 percent; 1982, 75 per cent; and 1983, 64 per cent (Warr 1985, p. 12).
Processing Zone Authority and Korea's Free Export Zone Administration Office. These bodies act as intermediaries between EPZ firms and the government to reduce EPZ firms' administrative costs and to prevent unnecessary and costly delays. The degree to which these bodies are empowered to act on behalf of the government varies greatly, but other departments commonly resent interference with their "normal" functions and occasionally become uncooperative with the EPZ bodies.

28. The regulations applying within the domestic economy but from which EPZ firms are exempted typically include: restrictions on foreign ownership of firms (EPZ firms are usually allowed to be fully foreign-owned); restrictions on repatriation of profits; restrictions on the employment of foreign nationals in managerial, supervisory and technical roles; and requirements for special approvals for the importation and installation of labor-saving capital equipment. EPZ firms may also be granted access to the host country's allocation of import quotas. This is very important for garment producers wishing to export to the European Economic Community.

3.2.4 Superior Physical Infrastructure and Subsidized Utilities

29. An EPZ consists of a heavily fenced area with a perimeter and gates policed by customs officials. Policing is necessary to prevent duty-free materials from being smuggled into the domestic economy. Within this area, infrastructure facilities such as roads, and telephone and telex communications are normally superior to those outside. Nevertheless, these facilities are still generally inferior to those found in the industrial areas of developed countries.
30. In addition, utilities are sometimes subsidized. Electricity tariffs are especially important in this regard because the light manufacturing enterprises in EPZs are heavy users of electrical power. The rates charged within EPZs are frequently below, and are never above, industrial rates elsewhere in the host country.

31. EPZs usually include standard-construction factory buildings, constructed and managed by government authorities, within which investing firms may rent floor space. Rental rates are generally lower than commercial industrial rates elsewhere within the country. Alternatively, firms may lease land within the zone and construct their own buildings. If firms which have constructed their own buildings leave the zone, they may sell or lease these buildings.

4. THE ECONOMIC RECORD OF EPZs IN FOUR ASIAN COUNTRIES

4.1 Aggregate Economic Performance

32. This section summarizes the results of detailed studies of EPZs in four Asian countries. These are:

**Indonesia:** The Jakarta Export Processing Zone.

**Korea:** The Masan Free Export Zone.

**Malaysia:** The Penang Free Trade Zones.

**Philippines:** The Bataan Export Processing Zone.

33. Each of these zones began operations in the early 1970s. Each is the largest and longest-operating EPZ in the country concerned. Our
discussion in this section draws on detailed case studies of these four zones previously conducted by the present author. 5/

34. Tables 1 to 4 summarize the aggregate economic performance of each of these zones up to 1982. Among them, these four EPZs employed roughly 90,000 people in 1982. In itself, this is not especially impressive, but these zones are representative of many others in Asia with a total employment of at least three times this amount. The Indonesian zone is less representative of EPZs in general than the other three. It is small and has a number of unusual characteristics. Nevertheless, it is worthy of examination in that it was begun as an experimental project and, partly on the basis of its performance, the Indonesian government has decided to establish several more EPZs.

35. A feature of the zones not revealed by the tables is their industrial composition. A typical pattern is that in the earliest years of the zones garments production dominates, but that electronics subsequently becomes more important. Indonesia and Malaysia are exceptions in that garments have always been the dominant industry in the former and electronics in the latter. These two industries are quite different. Garments production is generally far more labor-intensive and utilizes a technology which has remained static for many years. Some production processes in electronics production and assembly are also labor-intensive, but generally speaking both capital intensity and the rate of technological change are much higher than in garments production.

5/ These case studies are: Indonesia, Warr (1983); Korea, Warr (1984); Malaysia, Warr (1987a); and the Philippines, Warr (1985 and 1987). Readers wishing more detail on individual cases may refer to these studies.
36. The aggregate data in Tables 1 to 4 also fail to reveal the "footloose" character of EPZ firms. The data on total numbers of firms present in the zones conceal the high rate of mobility of firms into and out of the EPZs. The case of the Philippines' Bataan EPZ provides a good example. From Table 4, the total number of firms occupying the zone at the beginning of the years 1979 to 1982 remained almost constant, increasing from 51 to 52 firms during 1980. But during 1979, four firms entered the zone and four others left. In 1980, five entered and four left. During 1981, three entered and three left and during 1982, two entered and four left.

37. Aggregate data on export volumes and employment also disguise the high degree of year to year variation in output and employment that characterizes individual EPZ firms. Table 4 shows that between 1981 and 1982, total exports from the Bataan EPZ rose by 19 per cent. When the data are examined at the level of individual firms, exports rose in only 29 of the 52 firms which were present at the beginning of 1981 and declined in 26, including the three which left the zone during that year. The average increase in firm-level exports among the first group, weighted by exports in 1981, was 42 per cent, while the weighted average decline among the second group, excluding the three which left the zone, was 29 per cent. These large variations in output partly reflect the adjustments of the larger corporations to which EPZ firms belong, in response to perceived changes in demand for their products. But they also reflect the international relocation of production within these corporations, in response to perceived changes in the profitability of its firms in particular locations.
4.2 Local Raw Material Use and Technology Transfer

38. One of the host country benefits which were anticipated when the zones were established was that EPZ firms would gradually increase their purchases of local raw materials. It was thought that the commercial contacts accompanying these backward linkages would benefit domestic firms through "technology transfer". The record has been disappointing. Except for Indonesia, local raw materials comprise no more than a third of total raw material use. In Indonesia, local textiles are purchased significantly by the zone's garment producers. In Korea, some electrical and electronic components are purchased by electronics producers, along with the textiles purchased by garment producers. In contrast with this, in Malaysia and the Philippines, the use of local raw materials is quite low. In Malaysia, local raw materials comprise only a few per cent of total raw material use. Purchases of raw materials and intermediate goods produced by other EPZ firms is more than three times as important. In the Philippines, the share of local raw materials had declined to less than 10 per cent by 1982.

39. The reluctance of EPZ firms to purchase local raw materials is not due primarily to a lack of financial incentives. "Drawback" and similar schemes are nearly always in place. Rather, the managers of EPZ firms report that the low and unreliable quality of local raw materials is the main obstacle. Entire shipments of finished goods can be rejected if the raw materials or intermediate goods used in the production process were inferior. A second factor is the changing industrial composition of the EPZs. Garment and footwear manufacture uses a much higher proportion of local raw materials than electronics assembly. As the composition of the EPZ shifts toward electronics, the proportion of local raw materials declines.
40. A third factor explaining the reluctance to rely upon local raw materials derives from the global strategies of the corporations involved. Especially in electronics, the parent firms wish to preserve a high level of international mobility for their processing operations. Developing long-term commercial relationships with suppliers in the countries in which EPZs happen to be located does not serve this goal. Purchases of these raw materials may be subsidized, but these subsidies will end once the firm leaves the country, requiring it to develop new relationships with suppliers elsewhere. It is more expedient to source these purchases at the cheapest reliable international source if the corporation wishes to retain the capacity to relocate its processing activities internationally at short notice.

41. Aside from the sourcing of raw materials, it is generally recognized that the "technology transfer" that was initially hoped for has not occurred. Of course, many of the industries in EPZs possess no technology that is not universally available. Labor-intensive garment production is a good example. Those that do, of which electronics firms are the best example, guard their technological secrets carefully, even from their own work forces. This information is a valuable corporate asset and some of the firms' competitors are generally producing within the same EPZ. To hand technological knowledge to the locals is also to hand it to one's competitors. Technological knowledge is valuable and it is hardly surprising that it is not readily given away; it has to be purchased.

4.3 Working Conditions and Wages

42. The working conditions provided in EPZs have been widely criticized by writers from industrialized countries. This criticism has commonly
rested on a comparison between an exaggerated picture of harsh working conditions and low wages in EPZs, on the one hand, with the more favorable conditions in industrialized countries, on the other. Often, this perspective is combined with the insistence that EPZ firms are "exploiting" their workers and enjoying enormous profits, all at the expense of potential employment in similar labor-intensive industries in the industrialized countries. This type of discussion has usually not reflected familiarity with the employment conditions and wages existing outside the EPZs in the developing countries concerned. It has thus ignored the obvious fact that unless workers were better off being "exploited" in an EPZ than otherwise, the EPZ firms would find it impossible to hire.

43. Useful information on working conditions, wages and worker characteristics in the Philippines' Bataan EPZ, and in similar industries elsewhere in that country, was provided by Castro (1982). Zone workers are typically female (74 per cent of total employment), unmarried (two thirds of Castro's sample) and between the ages of 17 and 24 years. Most have no previous factory experience (two thirds of Castro's sample) and turnover rates are high. The average duration of zone employment is around three years. Most of the workers in Castro's sample were temporarily absent members of larger households (average size six members) and the income of the zone worker represented roughly half the combined cash incomes of these households.

44. Of those workers in Castro's sample who had worked previously in paid employment, their average EPZ earnings were 35 per cent higher than their previous earnings. According to Castro's survey, almost half of all zone workers worked overtime and the average working week was 54 hours.
Castro concludes that there was a clear income gain from moving to a job in the EPZ.

45. Data provided in a survey conducted by the Philippines' Ministry of Trade and Industrysuggest that, allowing for differences in living costs, real wages of unskilled workers are roughly the same in the EPZ as in similar employment in the capital city. Real wages for skilled workers were somewhat higher in the EPZ. Skilled workers must be recruited from the capital city, requiring a premium to attract them, whereas unskilled workers may be drawn from any part of the country, including rural areas.

46. EPZ firms appear generally to adhere to minimum wage laws, when these exist. Firms operating within the domestic manufacturing sector may often avoid these regulations but the greater visibility of the EPZs and their politically sensitive position apparently make violations of minimum wage restrictions more difficult within the zones.

5. THE ENCLAVE MODEL AND THE WELFARE ECONOMICS OF EPZs

5.1 The Enclave Model

47. We now consider the net welfare impact of an EPZ. We wish to identify the benefits and costs resulting from the EPZ's existence, as experienced by citizens of the host country. Details are provided in Warr (1985). Our aim is to compare the

7/ Our discussion will disregard income distributional considerations within the host country.
observed situation in which the zone is present with the hypothetical one in which it is absent. The foreign ownership of firms and the 'offshore' nature of the zones themselves suggests a simple framework within which their impact on the domestic economy can be analyzed. This framework can be termed the "enclave approach", following Corden (1974 and 1985). It is depicted in Figure 2.

48. Consider the flows of goods and services and the financial flows which occur, on the one hand, between the EPZ and the rest of the world and, on the other hand, the flows occurring between the EPZ and the domestic economy of the host country. The essence of the enclave approach is that flows of the second kind are relevant for the evaluation of the welfare impact of the zone on citizens of the host country but that flows of the first kind are not.

49. The EPZ firms purchase intermediate and capital goods from abroad and these flows are accompanied by financial flows in foreign currency in the opposite direction. In vertically integrated firms these transactions occur within the firm, giving rise to questions of transfer pricing. The firm may also repatriate profits to parent companies abroad. The thrust of the enclave approach is that all these transactions between the EPZ firms and the outside world are irrelevant for an evaluation of the

---

8/ To keep Figure 2 simple these financial flows are not indicated in the diagram. Most of the flows shown in the diagram are accompanied by financial flows in the opposite direction, but exceptions are taxes and subsidies and external effects such as transfers of managerial and technical knowledge.
effects of the zone on economic welfare within the host country, except insofar as they impinge on linkages between the EPZ and the domestic economy.

50. The issue of transfer pricing provides a good illustration of this point. Suppose first that there is no company income taxation applying to EPZ firms within the host country - an accurate assumption for many countries possessing EPZs. Transfer pricing influences whether a firm's profits will be realized, in accounting terms, in the host country or elsewhere. But so long as these profits are earned by the (foreign) EPZ firm, whether they are realized in the host country or abroad, whether they are repatriated or retained by the EPZ subsidiary, is essentially irrelevant for economic welfare in the host country. But now, if these profits are subject to domestic taxation within the host country, transfer pricing affects the magnitude of these taxes and becomes highly relevant.

51. In the next section (5.2) we discuss the main forms of economic linkage between EPZ firms and the domestic economy and their welfare significance. This leads to an algebraic expression for the net benefits of an EPZ in section 5.3.

5.2 Components of a Benefit-Cost Analysis of EPZs

5.2.1 Firms' Profits and Losses

52. Most firms occupying EPZs are foreign-owned. The profits or losses of these foreign firms, to the extent that they are retained or incurred by the firms themselves, do not enter our calculations directly. The domestically-owned portion of profits and losses from firms in the zone properly belongs in a national economic evaluation of the zone but these profits can seldom be estimated satisfactorily from the available data.
53. To the extent that they are collected, data on firms' profits and losses are unreliable. Many firms report losses every year while expanding their operations. These data in any case normally suggest that if the profits of domestic firms were to be measured accurately they would comprise only a miniscule proportion of the overall benefits from the EPZs.

54. In the benefit-cost analysis component of this study, firms in the zones will be treated, for the most part, as if they were fully foreign-owned. Therefore, the profits of domestically owned firms will be omitted. This is generally unavoidable, given data limitations, but in view of the small proportion of overall investment in the EPZs that these firms typically represent, this omission is minor.

5.2.2 Foreign Exchange Earnings

55. Public discussion of the benefits of EPZs has placed considerable stress on the foreign exchange earnings derived from the zones. This discussion has tended to reflect the presumption that these earnings have direct welfare relevance for the host country. For example, the possible effects that the transfer pricing practices of multinational corporations may have on the country's foreign exchange earnings from the zones has been widely discussed. But to a first order of approximation, the foreign exchange earnings of foreign-owned firms in the zones merely constitute transactions between these firms and firms abroad. Transactions of this sort have no direct effects on the economic welfare of domestic nationals and are therefore essentially irrelevant for the calculation of the host country's net gain from the zones.

56. It must be realized that regardless of the difference between a firm's officially declared exports and imports for a given year, the
corresponding amount of foreign exchange remains the property of the firm itself (leaving possible taxation aside for the moment). It would be incorrect to call this amount the host country's foreign exchange earnings. These funds may be:

(i) held in liquid form in foreign exchange accounts, whether inside or outside the host country;

(ii) used for the purchase of imported capital equipment; or

(iii) converted into the domestic currency to be spent on wages and purchases from the local economy.

57. Item (i) is of little welfare importance and reduces simply to a decision as to where the firm chooses to do its banking. Item (ii) can also be disregarded if the imported capital equipment is ultimately disposed of abroad or scrapped. But item (iii) does have welfare importance because the opportunity costs of labour and raw material purchases are commonly thought to be less than the prices paid by the EPZ firms. This is due in part to distortions in the domestic price system. That is, there may be a net benefit to the host country from these purchases. Thus, providing these benefits are estimated separately, the foreign exchange earnings of EPZ firms is not in itself an important issue.

58. To purchase domestic raw materials and services from the domestic economy and to hire local workers, EPZ firms must convert sufficient foreign exchange earnings into the domestic currency to meet these expenses. The conversion of foreign exchange into domestic currency is made through the central bank at the official exchange rate. The question therefore arises whether the social value of the foreign exchange received by the host country's central bank exceeds the value of the domestic currency the firms are given in exchange.
59. The value of the foreign exchange received must be understood to mean the domestic value of the additional traded goods and services the host country may absorb as a result of the addition to its foreign exchange holdings. The value of the domestic currency given in exchange to EPZ firms means the domestic value (opportunity cost) of the domestic factors of production and intermediate goods and services purchased by EPZ firms with these funds. In the circumstance where exchange controls and domestic proaction imply that the social value of foreign exchange in terms of the domestic currency exceeds the official exchange rate, the requirement that these currency conversions must be made through the central bank at the official exchange rate constitutes, in effect, a form of taxation.

60. It is helpful to think of this calculation in two separate steps. The first step is the calculation of the value in domestic currency of the additional traded goods the host country is able to absorb as a result of foreign currency received from EPZ firms relative to the amount of domestic currency given up. This ratio is equivalent to the shadow price of foreign exchange divided by the official exchange rate. The second step is the calculation of the social opportunity cost of the domestic factors and intermediate goods purchased by the firms relative to the market prices of these items, also in domestic currency. This part of the calculation, involving the shadow prices of domestic factors and raw materials, is best handled separately.

61. Of course, the firms' true foreign exchange earnings will presumably differ from their conversion of foreign exchange into domestic currency. Transfer pricing may be one of the mechanisms by which this profit is realized, but for an *ex post* measurement of the host country's
actual gains, the firm's actual foreign exchange conversion is the relevant statistic.

5.2.3 Employment

62. Host country governments' concern for the employment generated by the zone presumably reflects the view that the social benefits derived from generating an additional job outweigh the costs. In economic terms, therefore, the wage received by the worker is considered to exceed the social opportunity cost of employment in the zone. Difficulty arises when attempting to measure the relevant opportunity costs. Wages paid in the zones are normally equal to, or slightly above, wages paid in similar types of employment within the manufacturing sector outside the EPZ. Nevertheless, estimates of the social opportunity cost of unskilled and semi-skilled labor commonly suggest that it is substantially less than wages paid in the manufacturing sector.

63. Estimates of the social opportunity cost (shadow price) of skilled and unskilled labor can be found for most LDCs. A difficulty in applying these estimates arises in relation to the transfer of skills to EPZ employees. The estimated value of these transfers, from a domestic standpoint, could in principle be incorporated either by reducing the estimated opportunity cost of labor parameter, or by increasing appropriately the wage received parameter. Either way, the ratio of the estimated opportunity cost of labor to the effective wage received would be reduced. However, in the absence of detailed estimates of the value of these transfers there is no solid basis for making such an adjustment. Consequently, some arbitrariness cannot be avoided.
5.2.4 Technology transfer

64. During the planning of the EPZs it was usually hoped that the zones would enhance transfers of technology and skills to firms in the domestic economy. It is generally agreed among zone administrators that the zones have been a major disappointment in this respect. Those firms which possess technological knowledge from which local firms could benefit (most notably electronics and electrical firms) have been largely isolated from the domestic economy. Little of the raw materials and capital equipment purchased by these firms has come from local sources. This is understandable, given the difficulty experienced by EPZ firms in finding local sources for their raw material requirements which can meet the necessary standards of quality and reliability of supply, but since these backward linkages were cited as a major potential source of technology transfer it must be said that the benefits hoped for from this source have not been realised. In retrospect, the earlier expectations were naive. To the extent that intermediate products are internationally traded, EPZ firms should be expected to continue to purchase from the cheapest reliable source.

65. Managerial techniques and methods of product quality control are inevitably transferred to the local middle level managers the firms employ. If these workers then seek employment in domestic industry, the managerial training they have received confers a benefit to the domestic economy. This may not be fully captured in the wages these workers receive in the EPZs. After a period of employment by foreign firms in the zones these managers can obtain significantly higher salaries than they could have obtained after a similar period of employment elsewhere, and this suggests
that these benefits exist. One way of treating this is to say that the social opportunity cost of the employment of these workers in the EPZ is lowered by such training. These externality effects can be incorporated in principle by adjusting (downwards) the opportunity cost of labor parameter.

5.2.5 Domestic Sales

Almost all of the output of EPZs must be sold abroad, but domestic sales are sometimes permitted when, for example, finished consumer goods are for some reason rejected by foreign buyers. In this case, these sales are typically treated as imports into the host country and duty must be paid at the normal rate. The economic effect of these sales is that they substitute for imports which would otherwise have occurred. The net value to the host country of the goods consumed is the value at c.i.f. prices of the imports which are displaced, but this is also the net price actually paid to the EPZ firm for the goods. The net price paid is the tariff-inclusive domestic price minus the duty. Thus, as these sales have no net welfare effects, they can be ignored in the benefit-cost analysis.

5.2.6 Purchase of Domestic Raw materials and Capital Goods

Governments typically encourage the use of domestically produced raw materials, intermediate inputs and capital goods by EPZ firms. This can be interpreted as meaning that the governments believe that the prices paid by firms for these materials exceed the marginal social costs of supplying them. Locally produced raw materials and capital goods generally compete with imported substitutes and the rates of duty applied to these imports provide the basis for estimation of the difference between the social opportunity cost of providing these imports (their border c.i.f. prices) and the prices paid (tariff inclusive). When EPZ firms receive a
rebate (drawback) from the host government equivalent to the duty which would have been paid on these imported inputs, there remains no net welfare effect from their purchase by EPZ firms.

5.2.7 **Electricity use**

68. EPZ firms, especially garment and textile producers, are major users of electricity. The benefit-cost analysis must compare the tariff rates paid with estimates of the long run marginal cost (LRMC) of supplying additional power. If the average tariff exceeded the LRMC, the use of electricity by EPZ firms would entail a net tax. In the reverse case, there would be a net subsidy.

5.2.8 **Domestic borrowing**

69. One of the inducements sometimes offered to foreign investors has been the freedom to borrow on local capital markets, sometimes combined with government guarantees of the repayment of these loans. Local borrowing would be relatively unimportant if the capital markets of the host country were open to international capital flows, because these loans would then simply induce private capital inflows from abroad. They would not displace local investment, but when local capital markets are closed, and interest rates deliberately suppressed, the analysis is quite different. This combination of factors is common among Latin American countries (Diaz-Alejandro, 1970) and also occurs in the Philippines.

70. The implication of the suppression of domestic interest rates is that the value of domestic output foregone as a result of additional borrowings by (foreign) firms operating in an EPZ exceeds the value of the compensation ultimately received from the EPZ firms in the form of interest and principal repayments. Another way of stating this is that the ratio of the shadow price of capital to the market price, $S^*_K$, exceeds unity.
5.2.9 **Taxes**

71. The taxes raised from EPZ firms are generally quite small, but they nevertheless represent a clear source of economic benefit for the domestic economy. They would not be received if the firms were not present, generally speaking, but firms which transfer to the zones from elsewhere in the host country, or foreign firms which would have entered in any case, if the zones were not present, represent exceptions. These exceptions seem certain to be unimportant. Most of the investment is foreign and, according to firm managers, very few of these firms would have entered the host countries in the absence of the package of incentives represented by the EPZs. The full value of taxes received is therefore counted as a net benefit to the host country.

5.2.10 **Development and Recurrent Costs**

72. The establishment of the zone site, its maintenance and administration all represent economic costs of the zone and in principle all should be evaluated at shadow prices. Reliance on financial costs is to some extent inevitable in the absence of disaggregated data. Against these costs must be placed the payments made by zone firms for land leasing and any other charges levied on zone firms, not counted elsewhere in the analysis.

5.3 **Net Benefits from an EPZ**

73. It is now possible to present a simplified algebraic expression for the net economic benefit derived from an EPZ, evaluated from the point of view of the host country. In a given year, t, the net benefit can be written
\[ N_t = (L_tw + M_tw + E_tw + R_t + T_t)S_F^* \\
\quad - (L_tw^* + M_tw^* + E_tw^* + B_tS_K^*) - A_t - K_t, \]  \hspace{1cm} (4)

where: 
- \( L_t \) denotes employment in year \( t \);
- \( w \) denotes the wage paid;
- \( M_t \) denotes domestic raw material used in year \( t \);
- \( P_M \) denotes the price paid for this raw material;
- \( E_t \) denotes the utilities (e.g. electricity) used in year \( t \);
- \( P_E \) denotes the price paid for these utilities;
- \( T_t \) denotes taxes paid in year \( t \);
- \( R_t \) denotes interest and principal repayments of domestic loans in year \( t \);
- \( S_F^* \) denotes the ratio of the social value of foreign exchange to the official exchange rate;
- \( w^* \) denotes the shadow price of labor;
- \( P_M^* \) denotes the shadow price of domestic raw material;
- \( P_E^* \) denotes the shadow price of utilities;
- \( B_t \) denotes domestic borrowing in year \( t \);
- \( S_K^* \) denotes the ratio of the shadow price of capital to its market price;
- \( A_t \) denotes the administrative costs of the zone in year \( t \);
- \( K_t \) denotes the capital cost (including maintenance) of the physical infrastructure of the EPZ provided by the host government in year \( t \).

74. Purely for simplicity, the above expression assumes all market and shadow prices to be constant over time. This restriction will not apply to our empirical results, presented later.
75. The first bracketed term represents the payments made by the EPZ firm to employ labour, purchase raw materials and electricity, to repay domestic loans and to pay taxes. These payments must be made in the domestic currency and so sufficient foreign exchange must be converted to domestic currency (at the official exchange rate) to finance these payments. This accounts for the term $S_F^*$ outside the brackets, the ratio of the social value of foreign exchange to the official exchange rate.

76. The second bracketed term represents the social opportunity cost of the labor, raw materials, utilities and financial capital absorbed by the EPZ firms. The final two terms, $A_t$ and $K_t$, denote the administrative and construction costs of the zone. During the construction of the zone these may be the only non-zero items. The net present value of the zone is then calculated by discounting $N_t$ over the life of the zone.

6. BENEFITS AND COSTS OF EPZs: EVIDENCE FROM FOUR ASIAN COUNTRIES

77. In this section we summarize and compare the results of detailed benefit-cost analyses of EPZs conducted for each of the four Asian countries discussed earlier: Indonesia, Korea, Malaysia and the Philippines. First (6.1), we summarise the basis for the cost-benefit analyses, in particular, the sources of the shadow prices which were used. Next (6.2), the results of the benefit-cost analyses are presented, and these results are then compared and analyzed in 6.3.

6.1 Sources of Shadow Prices

78. Estimates of the shadow prices of labour, foreign exchange, capital, etc., are available for most developing countries. In some cases, these
estimates lie buried in consultants' reports, government studies and other unpublished manuscripts, but they can be found. Their quality varies widely. In this study, the best available estimates of the major shadow prices and other relevant parameters for each country have been drawn upon. These were:

- **Indonesia:** Hughes (1983), Pitt (1981) and Munasinghe (1980).
- **Korea:** Koo (1981) and Nam (1981 and 1981a).
- **Malaysia:** Veitch (1977, 1979 and 1984).
- **Philippines:** Medalla and Power (1984) and Manalaysay (1979).

The above studies provided the basis for the shadow prices, but variations were made in some cases to update or correct the estimates they contain or to amend them to a form more suitable for the evaluation of EPZs. In several cases uncertainty remains in the estimates of the relevant shadow prices, so a range of values was used. We summarize below the values used for the most important shadow prices in the "base case" calculations. These are the seemingly "most likely" values in each case. They are summarized in Table 5 as ratios of the estimated shadow prices to market prices.

### 6.2 Results of the Benefit-Cost Analysis

Table 6 summarizes the contributions of each of the major benefit-cost categories to the calculated aggregate net present value (NPV) of the EPZs. Costs appear as negative items. The calculations each assume a real discount rate of 7.5 per cent and total life for the EPZ of 25 years. The final row of Table 6 displays the calculated internal rate of return for each
of the EPZs. Table 7 presents the NPV computations in somewhat more convenient form by expressing the various components as a percentage of the gross benefits of the EPZ (the sum of all positive NPV items appearing in Table 6).

6.3 Components of Computed Net Benefits and Costs

6.3.1 A Methodological Digression on Foreign Exchange Earnings

81. Before discussing the results in Tables 6 and 7 in detail it is useful to focus attention on a methodological point: the distinction between the benefits deriving from "foreign exchange earnings" and those deriving from other sources. As explained above, the benefits attributed to foreign exchange earnings arise from the fact that EPZ firms must convert foreign exchange into domestic currency to meet their domestic costs. These costs include their wage bills, purchases of domestic raw materials and capital equipment, taxes, utility bills, factory rentals, etc.

82. It is analytically possible to separate the net gains arising from the conversion of foreign exchange into domestic currency, on the one hand, from those arising from the subsequent domestic payments on the other, as reflected in Tables 6 and 7. Alternatively, the two can be combined, and it makes economic sense to do so. Indirectly, foreign exchange is being paid to domestic workers, raw material suppliers, etc. The separation of the benefits deriving from "foreign exchange earnings" from those arising from the subsequent domestic payments is somewhat artificial and is potentially misleading.

83. Consider a hypothetical example: the conversion of US$1m into Philippine pesos at the official (1982) exchange rate of P=9.17 = US$1 for
the payment of local wages. When the US$1m is converted into pesos, there is a net gain to the Philippines arising from the difference between the official exchange rate and the shadow price of foreign exchange - the social value of this foreign exchange. The estimated value of 1.25 for the ratio of the shadow price to the official rate implies a net gain of P=2.29m. Now when the P=9.17m is paid to Philippine workers there is a second net gain arising from the difference between the social opportunity cost of labor and the market wage. The estimated value of 0.64 for the ratio of these two quantities implies a net gain of P=3.3m. The distinction between these two sources of gain arises from the way our shadow prices have been defined. But the two are aspects of the one phenomenon: the (indirect) payment of US$1m to hire domestic workers. Philippine workers are indirectly earning for the Philippines US$1m in foreign exchange, generating a net gain to the Philippines of P=4.59m. 2/

84. Table 8 now shows the re-estimated distribution of net benefits taking the above argument into account. This table substitutes for the first five rows of Table 7. The gains from "foreign exchange earnings" have been redistributed among the other benefit-cost categories. The results for Indonesia are unchanged from Table 7 because the estimated net gains from foreign exchange earnings were zero in that case (see footnote to Table 5). The percentage totals do not add to 100 because only part of the firms'  

---

2/ The welfare outcome for the Philippines would have been essentially no different if the US$1m had been paid directly to Philippine workers, in exchange for their labor, who then converted it into the domestic currency through the Central Bank or other official channel.
foreign exchange conversions can be attributed to the four categories appearing in the table.

6.3.2 Benefits

85. We shall discuss first the composition of the estimated benefits from EPZs (the positive elements of Tables 6 to 8) and then turn to the cost items. Since the results for Indonesia require special explanation it is convenient to begin with the results for the other three countries.

86. From Table 7 it is clear that the major sources of gain in Korea, Malaysia and the Philippines derive from employment and foreign exchange earnings. With the gain from foreign exchange earnings distributed as in Table 8, employment accounts for more than half the gross benefits in each case. Local raw material use and tax revenues are of much smaller importance and across the three countries the overall importance of these two sources of gain is roughly similar. For these three countries, it is a useful approximation to say that the EPZs represent a form of indirect labor export; other sources of benefit are of minor importance.

87. Turning to the results for Indonesia, two unusual features of the Jakarta EPZ must be stressed. First, an unusually high proportion of the raw materials is obtained within Indonesia. These are primarily Indonesian textiles used in garments. By 1982 over 40% of all raw materials used were purchased from within Indonesia. The estimated net gains from this source actually outweigh the estimated net gains from employment generation.

88. The second unusual feature is the importance of the "tax and other revenue" category. The composition of the US$22.6m net gain from this source appearing in Table 6 is: property tax $2.9m; other official taxes $0.9m; "unofficial" taxes $25.9m; and expenditure on the drawback scheme -$7.1m 10/

10/ The negative sign draws attention to the fact that this item is a revenue outlay - a subsidy - rather than a tax receipt.
The "unofficial" tax item, discussed in detail elsewhere (Warr (1983) and Gray (1979)), represents the outcome of rent-seeking behavior by government officials.

89. Although it seems appropriate to include the "unofficial" tax item as a net benefit to Indonesia it is important to draw attention to it both because of what it reveals about the way the net benefits from the zone are distributed among individuals, and also because the collection of these rents is achieved at considerable social cost. A labyrinth of regulations and a highly "personalized" administration of both these regulations and the normal customs provisions provide the opportunity for heavy costs to be imposed on uncooperative firms. The outcome is clearly a wasteful form of revenue collection. If these revenues are excluded from the benefit-cost analysis, the NPV of $15m appearing in Table 6 becomes -$11m, and the IRR becomes negative (Warr 1983).

90. The $7.1m expenditure on the "drawback" scheme is a subsidy to the use of domestic raw material. This is intended to counteract the effects of protection on the costs of the imported items used in the production of these raw materials. Insofar as the estimated net gain from the use of these raw materials is smaller than this amount ($4.9m), it appears from these calculations that the "drawback" provisions are costing Indonesia more than they are worth.

6.3.3 Costs
91. The costs of achieving the benefits discussed above are summarized by the negative elements of Tables 6 and 7. In Table 7 they are expressed as a percentage of the sum of all net benefit items. The striking features of this table are the enormous infrastructure cost of the Philippines' Bataan
EPZ and also the heavy cost resulting from the granting to EPZ firms of (subsidized) access to the Philippine capital market. Each of these items is by itself sufficiently large to outweigh the sum of all benefits derived by the Philippines from its EPZ.

92. Another feature of the table is the low administrative and infrastructure cost of Malaysia's Penang Free Trade Zone. On the other hand, it is notable that the cost of Malaysia's subsidization of electricity effectively outweighs the combined benefits derived from the use of local raw materials, use of local capital equipment and all tax revenues raised from EPZ firms.

7. SUMMARY AND CONCLUSION: EPZs AND TRADE POLICY

93. EPZs are vehicles for attracting foreign investment in export-oriented, light manufacturing. At the time the zones were becoming popular, in the early 1970s, the governments establishing them almost invariably mentioned three objectives for the zones: foreign exchange earnings, employment, and technology transfer. The competition among host countries for "footloose" processing activities meant that individual countries generally found it more difficult than they had expected to attract this kind of investment. Nevertheless, to the extent that firms were attracted, the first two objectives of the zones were met.

94. The zones have contributed significantly to employment of unskilled and semi-skilled workers. Moreover, the conversions of foreign exchange into the domestic currency that were necessary to pay these workers contributed to the host countries' foreign exchange earnings. Indirectly, EPZ workers were
being paid in foreign exchange and in this respect EPZs were similar to the direct export of labor. Indeed, many of the countries establishing EPZs have also been exporting temporary labor directly, to the Middle East in particular.

95. The EPZs are generally isolated from the domestic economy. The substantial gains from "technology transfer" that were initially sought do not seem to have occurred. It had been hoped that the commercial contacts between EPZ firms and domestic firms that would accompany backward linkages from the zones to the domestic economy would lead to externalities of this sort, to the benefit of domestic firms. The use of domestic raw materials by EPZs has been less significant than had been hoped, and these linkages have generally been in areas where "technology transfer" is not particularly likely.

96. EPZ firms have made little contribution to tax revenue. This has been equally true in countries which have granted company income tax holidays and countries which have not. In the latter case (e.g. the Philippines) transfer pricing practices have been used to minimize the firms' global tax burdens. Many firms have declared operating losses every year for over a decade while expanding production. In those countries where tax holidays have been granted, the threat to leave the EPZ on expiration of the holiday has enabled firms to extend the holidays well beyond their official expiration dates.

97. The example of the Philippines shows that the limited benefits from EPZs can be extremely costly. The Philippines' first and largest EPZ, the Bataan EPZ, was an instrument of regional decentralization. The infrastructure costs of constructing an EPZ in the isolated site chosen were
very high. Moreover, to attract foreign firms into the zone, the government granted EPZ firms preferential access to the Philippines' capital market at suppressed interest rates and with government guarantees of the loans. Not surprisingly, most of the firms' investments in the zone -- over 90% -- were financed in this way (Warr, 1985 and 1987). The subsidy that was implicit in this policy led to a heavy social cost for the Philippines.

98. In contrast, the example of Malaysia shows that EPZs can be established and operated at relatively low cost. The Malaysian and Korean examples show that, viewed as public investments, EPZs can yield acceptable social rates of return. Of course, in these benefit-cost calculations all other policy instruments, and in particular all other instruments of trade policy, are held constant. It is possible to look at the EPZs in this partial manner, but this exercise raises the question of whether it would have been possible to achieve the benefits available from EPZs in another, more cost-effective way.

99. Export processing zones always permit the duty-free importation of raw materials and intermediate goods. In recent years, several of the countries to have established EPZs in the 1970s have extended this provision to firms producing for export but located outside the EPZs. The duty-free raw materials are held in bond on the factory site until required for production. The Philippines, Malaysia and Korea each provide good examples. To some extent, this change of policy undermined the advantages of the EPZs, but it showed that construction of expensive special zones was not necessary for the duty-free characteristic of EPZs to be made available to other firms (whether producing for export or not).
Duty free importation of raw materials and intermediate goods is not the only attraction of EPZs. Reduced "red tape", through the simplification of customs procedures, clarification or elimination of regulations, and the upgrading of industrial infrastructure are also important. There is no necessity to confine these provisions to the EPZs. A point that managers of foreign firms mention frequently is the importance of stable and clear policies to attract foreign investment. This obviously applies as much outside the EPZs as within. In short, most of the features that have enabled EPZs to attract foreign investment could be applied outside the zones, presumably with similar effectiveness, and without establishing new special enclaves, potentially at high cost.

The features of the domestic economy which impede foreign investment, and which EPZs are intended partly to counteract, also impede the development of efficient domestic industries. To the extent that a liberalized environment within the EPZs deflects attention from these matters, the net outcome could well be worse than what would have occurred in the absence of the zones.

The benefits from EPZs are limited. They are definitely not "engines of development". For countries in the early stages of development, the zones can provide an efficient and productive means of absorbing surplus labor. Even then, the zones could never be expected to provide more than a modest part of the solution to the employment problems of these countries. The problem is much too vast. EPZs also expose the domestic business community to examples of internationally competitive industrial enterprises and the resulting demonstration effect is undoubtedly of some value, especially in the early stages of industrialization, as are the externalities
arising from the on-the-job training of local middle-level managers. In the early 1970s, when the zones were being founded, high expectations were often voiced for these kinds of external benefits. It is difficult to assemble hard evidence on these matters, but close observers of EPZs, including zone administrators themselves, generally consider that these expectations have been realized at most very partially.

103. As industrial development proceeds, and the surplus labor which characterized the earlier stages of industrialization is absorbed, interest in EPZs tends to wane. Examples are Taiwan and Korea. Having been pioneers in the establishment of EPZs in the late 1960s and early 1970s, these countries have more recently become considerably less interested in this type of enclave development. Perhaps in the next couple of decades a similar change of attitude can be expected in many of the LDCs now actively promoting EPZs. Other LDCs, currently thought of as being pre-industrial, will presumably replace them.

104. Finally, it must be stressed that the success of the liberal economic environment existing within EPZs says a great deal about the nature of the economic environment existing outside the zones in the countries establishing them. In cases where EPZs have been successful in attracting new foreign investment, earning foreign exchange, generating employment, etc., two kinds of lessons can be drawn. Within a partial context, something is revealed about the utility of the export processing zone concept itself: EPZs can make a limited contribution to economic development, especially in the early stages of industrialization. But within a broader context, something much more important is also revealed about the degree to which restraints on trade, unnecessary bureaucracy and restrictive regulations have
inhibited and continue to inhibit economic activity outside the zones: the very success of EPZs points to the benefits that a more liberal economic environment could make possible within the domestic economy. It may well be that this demonstration is in fact the most significant contribution that EPZs can make to the development process.
References


"The industrial incentives and structure of protection in Korea" (in Korea), Korea Development Institute, Seoul, Mimeo.


_______ (1985) "Export Processing Zones in the Philippines", ASEAN - Australia Economic Papers No. 20, Australian National University, Canberra.


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of firms</td>
<td>Firms</td>
<td>4</td>
<td>7</td>
<td>15</td>
<td>18</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Employment Persons</td>
<td></td>
<td>778</td>
<td>1653</td>
<td>4217</td>
<td>6974</td>
<td>7526</td>
<td>7742</td>
</tr>
<tr>
<td>Exports USSm</td>
<td></td>
<td>0.9</td>
<td>12.0</td>
<td>5.9</td>
<td>10.7</td>
<td>20.7</td>
<td>37.5</td>
</tr>
<tr>
<td>Imports of raw materials USSm</td>
<td>1.2</td>
<td>11.6</td>
<td>6.4</td>
<td>13.0</td>
<td>13.5</td>
<td>13.0</td>
<td></td>
</tr>
<tr>
<td>Local raw materials USSm</td>
<td></td>
<td>-</td>
<td>0.61</td>
<td>0.6</td>
<td>1.9</td>
<td>5.2</td>
<td>9.5</td>
</tr>
<tr>
<td>Imports of capital goods USSm</td>
<td>0.1</td>
<td>1.0</td>
<td>1.0</td>
<td>1.2</td>
<td>0.8</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>Local capital goods USSm</td>
<td>-</td>
<td>-</td>
<td>0.03</td>
<td>0.01</td>
<td>0.03</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>Local/total raw materials %</td>
<td>-</td>
<td>-</td>
<td>0.00</td>
<td>0.00</td>
<td>0.18</td>
<td>0.20</td>
<td>0.41</td>
</tr>
<tr>
<td>Local/total capital goods %</td>
<td>-</td>
<td>-</td>
<td>2.0</td>
<td>2.0</td>
<td>4.6</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td>Total official taxes USSm</td>
<td>0.61</td>
<td>0.15</td>
<td>0.33</td>
<td>0.40</td>
<td>0.56</td>
<td>0.56</td>
<td></td>
</tr>
<tr>
<td>Estimated unofficial taxes USSm</td>
<td>0.23</td>
<td>3.11</td>
<td>1.32</td>
<td>2.70</td>
<td>3.6</td>
<td>3.6</td>
<td></td>
</tr>
</tbody>
</table>

Notes:  
a. All monetary quantities are in current prices.  
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1962</td>
<td>1.24</td>
<td>1.74</td>
<td>1.76</td>
<td>1.66</td>
<td>1.71</td>
<td>1.79</td>
<td>1.69</td>
<td>1.71</td>
<td>1.79</td>
<td>1.84</td>
<td>1.77</td>
</tr>
<tr>
<td>1963</td>
<td>1.83</td>
<td>2.22</td>
<td>2.29</td>
<td>2.07</td>
<td>2.27</td>
<td>2.33</td>
<td>2.30</td>
<td>2.27</td>
<td>2.30</td>
<td>2.33</td>
<td>2.27</td>
</tr>
<tr>
<td>1964</td>
<td>2.60</td>
<td>4.04</td>
<td>4.08</td>
<td>3.84</td>
<td>4.04</td>
<td>4.08</td>
<td>4.08</td>
<td>4.04</td>
<td>4.08</td>
<td>4.08</td>
<td>4.04</td>
</tr>
<tr>
<td>1966</td>
<td>6.06</td>
<td>8.20</td>
<td>8.16</td>
<td>7.64</td>
<td>8.11</td>
<td>8.20</td>
<td>8.16</td>
<td>7.64</td>
<td>8.11</td>
<td>8.20</td>
<td>8.16</td>
</tr>
<tr>
<td>1967</td>
<td>9.46</td>
<td>11.97</td>
<td>12.07</td>
<td>11.34</td>
<td>11.94</td>
<td>12.06</td>
<td>12.07</td>
<td>11.34</td>
<td>11.94</td>
<td>12.06</td>
<td>12.07</td>
</tr>
</tbody>
</table>

**Table 2:** Korea: Aggregate Economic Performance of Human E1
Table 8
Malaysia: Aggregate Economic Performance of Penang EPZs

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of firms</td>
<td>Firms</td>
<td>10</td>
<td>21</td>
<td>31</td>
<td>22</td>
<td>33</td>
<td>34</td>
<td>35</td>
<td>38</td>
<td>41</td>
<td>49</td>
</tr>
<tr>
<td>Employment</td>
<td>Persons</td>
<td>-</td>
<td>13,627</td>
<td>19,559</td>
<td>22,412</td>
<td>22,790</td>
<td>27,695</td>
<td>50,872</td>
<td>58,379</td>
<td>58,535</td>
<td>58,070</td>
</tr>
<tr>
<td>Exports</td>
<td>US$mn</td>
<td>2.1</td>
<td>53.6</td>
<td>94.2</td>
<td>192.2</td>
<td>274.3</td>
<td>226.1</td>
<td>581.9</td>
<td>1088.2</td>
<td>772.0</td>
<td>717.5</td>
</tr>
<tr>
<td>Sales</td>
<td>US$mn</td>
<td>-</td>
<td>0.1</td>
<td>2.8</td>
<td>1.7</td>
<td>6.9</td>
<td>4.6</td>
<td>9.4</td>
<td>2.6</td>
<td>0.06</td>
<td>14.5</td>
</tr>
<tr>
<td>Imported raw materials</td>
<td>US$mn</td>
<td>1.3</td>
<td>55.0</td>
<td>127.8</td>
<td>185.1</td>
<td>237.2</td>
<td>193.8</td>
<td>425.6</td>
<td>492.4</td>
<td>707.0</td>
<td>523.1</td>
</tr>
<tr>
<td>Raw materials</td>
<td>US$mn</td>
<td>0.07</td>
<td>0.9</td>
<td>2.8</td>
<td>7.1</td>
<td>6.7</td>
<td>10.5</td>
<td>13.8</td>
<td>14.5</td>
<td>14.5</td>
<td>18.9</td>
</tr>
<tr>
<td>Raw material from EPZs</td>
<td>US$mn</td>
<td>-</td>
<td>-</td>
<td>6.8</td>
<td>12.0</td>
<td>15.1</td>
<td>40.8</td>
<td>64.5</td>
<td>76.8</td>
<td>48.9</td>
<td>62.3</td>
</tr>
<tr>
<td>Imported capital equipment</td>
<td>US$mn</td>
<td>0.4</td>
<td>12.4</td>
<td>54.7</td>
<td>29.7</td>
<td>9.5</td>
<td>15.2</td>
<td>120.0</td>
<td>53.9</td>
<td>36.6</td>
<td>36.6</td>
</tr>
<tr>
<td>Local capital equipment</td>
<td>US$mn</td>
<td>0</td>
<td>1.8</td>
<td>18.9</td>
<td>27.0</td>
<td>2.2</td>
<td>3.6</td>
<td>2.6</td>
<td>21.7</td>
<td>3.3</td>
<td>4.0</td>
</tr>
<tr>
<td>Local raw material/ total raw material</td>
<td>%</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Local capital equipment/total capital equipment</td>
<td>%</td>
<td>0</td>
<td>12</td>
<td>28</td>
<td>48</td>
<td>19</td>
<td>19</td>
<td>18</td>
<td>29</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Total wages paid</td>
<td>US$mn</td>
<td>0.9</td>
<td>6.3</td>
<td>8.2</td>
<td>14.7</td>
<td>17.4</td>
<td>25.0</td>
<td>48.2</td>
<td>56.6</td>
<td>72.3</td>
<td>80.5</td>
</tr>
<tr>
<td>Total electricity used</td>
<td>US$mn</td>
<td>0.4</td>
<td>0.7</td>
<td>1.7</td>
<td>5.7</td>
<td>6.9</td>
<td>7.0</td>
<td>8.8</td>
<td>12.1</td>
<td>17.8</td>
<td>28.5</td>
</tr>
<tr>
<td>Total taxes paid</td>
<td>US$mn</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Notes: a. All monetary quantities are in current prices.

Table 4  Philippines: Aggregate Economic Performance of Bataan EPZ

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of firms</td>
<td>Firms</td>
<td>1</td>
<td>5</td>
<td>14</td>
<td>18</td>
<td>39</td>
<td>38</td>
<td>47</td>
<td>51</td>
<td>51</td>
<td>52</td>
<td>52</td>
</tr>
<tr>
<td>Employment</td>
<td>Persons</td>
<td>-</td>
<td>1,290</td>
<td>3,521</td>
<td>5,562</td>
<td>8,962</td>
<td>12,821</td>
<td>17,405</td>
<td>18,977</td>
<td>19,294</td>
<td>19,858</td>
<td>19,410</td>
</tr>
<tr>
<td>Exports US$m</td>
<td>0.4</td>
<td>0.9</td>
<td>2.1</td>
<td>7.3</td>
<td>22.4</td>
<td>39.7</td>
<td>73.1</td>
<td>98.2</td>
<td>122.7</td>
<td>134.0</td>
<td>159.6</td>
<td></td>
</tr>
<tr>
<td>Local sales US$m</td>
<td>-</td>
<td>3.9</td>
<td>6.8</td>
<td>4.3</td>
<td>11.7</td>
<td>13.6</td>
<td>14.8</td>
<td>16.5</td>
<td>18.3</td>
<td>8.2</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>Imports of raw materials US$m</td>
<td>0.2</td>
<td>0.5</td>
<td>2.9</td>
<td>7.0</td>
<td>15.0</td>
<td>18.5</td>
<td>47.3</td>
<td>66.4</td>
<td>77.3</td>
<td>81.2</td>
<td>122.3</td>
<td></td>
</tr>
<tr>
<td>Local raw materials US$m</td>
<td>0.07</td>
<td>0.2</td>
<td>0.3</td>
<td>0.9</td>
<td>4.2</td>
<td>9.9</td>
<td>3.6</td>
<td>7.9</td>
<td>9.5</td>
<td>7.4</td>
<td>9.5</td>
<td></td>
</tr>
<tr>
<td>Local/total raw material %</td>
<td>38</td>
<td>38</td>
<td>8</td>
<td>10</td>
<td>21</td>
<td>20</td>
<td>7</td>
<td>11</td>
<td>14</td>
<td>9</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Total wages paid US$m</td>
<td>n.a.</td>
<td>0.6</td>
<td>1.5</td>
<td>2.5</td>
<td>4.3</td>
<td>6.6</td>
<td>9.3</td>
<td>14.4</td>
<td>20.4</td>
<td>22.4</td>
<td>21.8</td>
<td></td>
</tr>
<tr>
<td>Total electricity used US$m</td>
<td>n.a.</td>
<td>0.1</td>
<td>0.3</td>
<td>0.5</td>
<td>0.7</td>
<td>0.9</td>
<td>1.2</td>
<td>1.6</td>
<td>1.5</td>
<td>1.7</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>Total taxes paid US$m</td>
<td>n.a.</td>
<td>-</td>
<td>0.07</td>
<td>0.5</td>
<td>0.4</td>
<td>0.6</td>
<td>1.5</td>
<td>2.2</td>
<td>1.9</td>
<td>1.7</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Total domestic borrowings US$m</td>
<td>1.8</td>
<td>22.8</td>
<td>51.4</td>
<td>117.8</td>
<td>95.9</td>
<td>89.4</td>
<td>3.8</td>
<td>2.8</td>
<td>2.3</td>
<td>1.9</td>
<td>1.5</td>
<td></td>
</tr>
</tbody>
</table>

Notes:  

a. All monetary quantities are in current prices.

b. Sources: Export Processing Zone Authority, Manila; International Monetary Fund, International Financial Statistics, various issues; and Warr (1985).
Table 5  Estimated Ratios of Shadow Prices to Market Prices

<table>
<thead>
<tr>
<th></th>
<th>Indonesia</th>
<th>Korea</th>
<th>Malaysia</th>
<th>Philippines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor</td>
<td>0.75</td>
<td>0.91</td>
<td>0.83</td>
<td>0.64</td>
</tr>
<tr>
<td>Foreign exchange</td>
<td>1.00 a/</td>
<td>1.08</td>
<td>1.11</td>
<td>1.25</td>
</tr>
<tr>
<td>Domestic raw material</td>
<td>0.85</td>
<td>0.92</td>
<td>0.90</td>
<td>0.96</td>
</tr>
<tr>
<td>Domestic capital equipment</td>
<td>0.85</td>
<td>0.98</td>
<td>0.91</td>
<td>0.96</td>
</tr>
<tr>
<td>Electricity</td>
<td>1.05</td>
<td>1.33</td>
<td>0.93</td>
<td>1.30</td>
</tr>
<tr>
<td>Domestic financial capital</td>
<td>n.a. b/</td>
<td>n.a.</td>
<td>n.a.</td>
<td>1.58</td>
</tr>
</tbody>
</table>

Notes:

a/ Hughes (1983) concluded that the effects of Indonesia’s import barriers (tariffs and quotas) which raise domestic prices above border prices, and subsidies on the consumption of traded goods (such as rice and petroleum products) roughly cancelled, implying that the shadow price of foreign exchange was approximately roughly equal to the official rate.

b/ n.a. means not applicable.

Table 6  Welfare Impact of EPZs: Composition of Net Present Value

(US$ millions, 1982 prices)

<table>
<thead>
<tr>
<th></th>
<th>Indonesia</th>
<th>Korea</th>
<th>Malaysia</th>
<th>Philippines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment</td>
<td>4</td>
<td>39</td>
<td>111</td>
<td>59</td>
</tr>
<tr>
<td>Foreign exchange earnings</td>
<td>0</td>
<td>65</td>
<td>94</td>
<td>72</td>
</tr>
<tr>
<td>Local raw materials</td>
<td>5</td>
<td>16</td>
<td>18</td>
<td>3</td>
</tr>
<tr>
<td>Local capital equipment</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Taxes and other revenue</td>
<td>23</td>
<td>18</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Electricity use</td>
<td>-1</td>
<td>-13</td>
<td>-53</td>
<td>-4</td>
</tr>
<tr>
<td>Administrative costs</td>
<td>-13</td>
<td>-17</td>
<td>-4</td>
<td>-23</td>
</tr>
<tr>
<td>Infrastructure costs/subsidies</td>
<td>-3</td>
<td>-68</td>
<td>-43</td>
<td>-196</td>
</tr>
<tr>
<td>Domestic borrowings</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-147</td>
</tr>
<tr>
<td>Total NPV</td>
<td>15</td>
<td>40</td>
<td>143</td>
<td>-225</td>
</tr>
<tr>
<td>(IRR(%)</td>
<td>(26)</td>
<td>(15)</td>
<td>(28)</td>
<td>(-3)</td>
</tr>
</tbody>
</table>
Table 7  Percentage Composition of Net Present Value
(% of Gross Benefits)

<table>
<thead>
<tr>
<th></th>
<th>Indonesia</th>
<th>Korea</th>
<th>Malaysia</th>
<th>Philippines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment</td>
<td>13</td>
<td>28</td>
<td>46</td>
<td>41</td>
</tr>
<tr>
<td>Foreign exchange earnings</td>
<td>0</td>
<td>47</td>
<td>39</td>
<td>50</td>
</tr>
<tr>
<td>Local raw materials</td>
<td>16</td>
<td>12</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Local capital equipment</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Taxes and other revenue</td>
<td>72</td>
<td>13</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Electricity use</td>
<td>-3</td>
<td>-9</td>
<td>-22</td>
<td>-3</td>
</tr>
<tr>
<td>Administrative costs</td>
<td>-41</td>
<td>-12</td>
<td>-2</td>
<td>-16</td>
</tr>
<tr>
<td>Infrastructure costs/subsidies</td>
<td>-9</td>
<td>-49</td>
<td>-18</td>
<td>-135</td>
</tr>
<tr>
<td>Domestic borrowings</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-101</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>47</strong></td>
<td><strong>29</strong></td>
<td><strong>59</strong></td>
<td><strong>-155</strong></td>
</tr>
<tr>
<td></td>
<td>Indonesia</td>
<td>Korea</td>
<td>Malaysia</td>
<td>Philippines</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-----------</td>
<td>-------</td>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>Employment</td>
<td>13</td>
<td>55</td>
<td>68</td>
<td>69</td>
</tr>
<tr>
<td>Local raw materials</td>
<td>16</td>
<td>14</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>Local capital equipment</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Taxes and other revenue</td>
<td>72</td>
<td>14</td>
<td>5</td>
<td>9</td>
</tr>
</tbody>
</table>
Figure 1

Movement of the Footloose Manufacturer

poor country

rich country

value-added

rate of return to mobile capital goods
Rest of the world

- intermediate goods
- processed goods
- capital goods
- remitted profits
- management
- technical knowledge

EPZ

- labor
- raw materials
- capital goods
- processed goods
- taxes
- subsidies
- utilities
- external effects

Domestic economy

The Enclave Model

Figure 2