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EXPORT PROMOTION VIA INDUSTRIAL ENCLAVES:  
THE PHILIPPINES' BATAAN EXPORT  
PROCESSING ZONES

by

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Export Promotion via Industrial Enclaves:  
The Philippines' Bataan Export Processing Zone\*

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The economic merits of export processing zones as a form of export promotion are studied by focusing upon a large, long-established zone in the Philippines. It is shown that although the absence of trade duties and other regulations led the zone to generate significant benefits for the Philippines through employment and foreign exchange earnings, this effect was outweighed by the heavy public infrastructure investment necessitated by the choice of location. Moreover, although the firms occupying the zone are predominantly foreign, over ninety per cent of their investment was financed by government-guaranteed borrowings from within the Philippines.

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## I. INTRODUCTION

The Philippines is one of many LDCs to have become actively committed to promoting the export of non-traditional manufactured goods and to have established export processing zones as a component of this effort. These export processing zones (EPZs) are enclaves within the domestic economy within which investing firms (mostly but not entirely foreign) enjoy favoured treatment with respect to importation of intermediate goods, taxation, provision of infrastructure, and freedom from industrial regulations applying elsewhere. The detailed form of these provisions varies across countries but a common feature is the almost complete absence of either taxation or regulation of imports of intermediate goods into the zones. This privilege is subject to the conditions (a) that all imported intermediate goods are utilised fully within the zones, and not sold on the domestic market, and (b) that all (or almost all) final output is exported.

Three such EPZs currently exist in the Philippines.<sup>1</sup> One, the Bataan EPZ, is located at Mariveles, at the tip of the Bataan Peninsula of Luzon Island. It was established in 1972. Two other export processing zones commenced operations in 1980. One is located on Mactan Island, adjacent to Cebu City, the second largest city in the Philippines, and the other near Baguio City in the mountains of central Luzon. These two zones each remain less than one tenth the size of the Bataan zone in terms of



output and employment and are still largely in the development stage. In 1982 these three zones accounted for 11 per cent of the Philippines' total non-traditional exports and 5 per cent of its aggregate exports of all goods.

In 1981 the government foreshadowed the establishment of 12 more export processing zones throughout the country. This decision reflected government concern that the Philippines' export performance be improved and the realisation that the country's import substitution policies of the 1960s and 1970s had failed to promote the development of an efficient manufacturing sector. But the large public investment required to establish an EPZ still raises the question of whether creation of these zones represents an efficient form of public expenditure. Detailed empirical studies are the only means by which this can be determined, and the present paper attempts to provide this.

The paper attempts to study the economic merits of this form of export promotion by focusing upon the largest and longest operating of the three existing zones, the Bataan EPZ. We study the economic benefits and costs resulting from the establishment of this zone, evaluated from the perspective of the Philippine population. The aim is to draw lessons for the Philippines and other countries who are considering establishing new EPZs.

Although several earlier writings have discussed the Bataan zone, generally in critical terms, an overall economic evaluation

has not been provided.<sup>2</sup> This has usually been attributed to a lack of data, but in fact abundant data on the operation of the zone exists and is readily available. What has been most lacking is a conceptual framework within which the relevant components of the benefits and costs of an EPZ can be identified and compared with one another, and the present paper attempts to provide such a framework.

## II. HISTORY OF THE BATAAN ZONE

In 1969 the Philippine government formally established a Foreign Trade Zone adjacent to the port of Mariveles. It was hoped that this development would contribute to the reduction of the balance of payments and employment problems perennially experienced by the Philippines. This hope was encouraged by the apparent success of Taiwan's Kaohsiung Export Processing Zone, established in 1965, in attracting foreign investment, stimulating exports and generating employment. The name of the Mariveles zone was subsequently changed, in November 1972, to the Bataan Export Processing Zone. It commenced operations in 1973.

The choice of the Mariveles area was not a natural one for an industrial development. This region is 160 kilometers by road from the capital, Metropolitan Manila, where both the industrial base of the country and government offices are heavily concentrated. In 1969 Mariveles was an isolated fishing village. The road connecting it to Manila was poor and although some port

facilities existed at Mariveles they required considerable upgrading to be capable of servicing the proposed zone. Upgrading was undertaken, but even the expanded port proved incapable of handling container vessels and almost all cargo is now transported by road to and from the port of Manila.

In addition, the population of Mariveles was small. Most of the workers to be employed in the zone had to be recruited from outside Mariveles, and indeed outside Bataan province, requiring housing and other amenities not currently existing in the area. Water and electricity facilities also required new public investment and a large and expensive dam was ultimately constructed in the side of a mountain. Finally, the area to be occupied by the zone itself was hilly and substantial earth movement was required. Political bargaining in the pre-martial law Philippine Congress led to the selection of the Mariveles area, but this compromise has proved to be costly.<sup>3</sup>

Government documents relating to the EPZs emphasise employment generation, foreign exchange earnings, technology transfer, development of linkages with the domestic economy and encouragement of decentralization of manufacturing away from Metropolitan Manila as having been the major economic benefits anticipated. It was expected that by 1976/77 40,000 direct factory workers would be employed in the EPZ itself with another 100,000 jobs indirectly created by the operations of the zone.<sup>4</sup>



A significant feature of the changes introduced in 1972 was the establishment of the Export Processing Zone Authority (EPZA) to plan, establish and manage the Bataan zone and any others which may be established later. This agency, attached to the Ministry of Trade and Industry and administered under the authority of a special government committee, was given considerable autonomy within the zone and also the power to act as an intermediary between firms inside the zone and offices of the various government departments in Manila. At the same time, a new incentive package was introduced in an effort to attract foreign manufacturing firms into the zone.

### III. INCENTIVE PACKAGE

In contrast with EPZs in several other Asian countries, the Philippines does not offer company income tax "holidays" to investing firms, but in other respects the incentive package offered is quite favourable. Firms located outside the EPZ but producing for export are also eligible for many of the special arrangements provided to attract foreign firms into the EPZ. For the most part, the fiscal incentive package available to EPZA-registered firms is similar to that available under the Export Priorities Plan to Board of Investment (BOI)-registered firms operating outside the EPZ. It is in the non-fiscal area that the most significant differences arise.

### Fiscal incentives

Firms registered by EPZA are officially exempt from payment of customs duties on imported raw materials, semi-processed inputs and capital equipment. They are in fact exempt from virtually all regulations applying to imports. Exemptions are also granted from all export taxes, including the stabilisation tax. Unlike BOT-registered firms outside the zone, EPZ firms are also exempt from all municipal and provincial taxes except real estate taxes. In addition, a rebate is available for locally purchased raw materials and semi-manufactured goods which are used in production for export. This rebate is in principle equivalent to the sales tax, compensating tax and specific tax component of the purchase prices of these goods and can be used as a credit against most tax obligations and other government payments. EPZ firms have also been exempt from the special taxes introduced since 1980 to cope with the government's fiscal crisis, and which other BOT-registered firms must pay. This includes the "economic stabilization fund" tax and special wharfage taxes.

Unfortunately, the formal exemption from customs duties does not prevent costly delays from occurring at customs check-points. "Unofficial taxes" are said to be demanded on some occasions when firms wish to expedite customs clearance of urgently required imported materials, but firm managers report that as a component of their total costs the overall magnitude of these payments is not significant. In this respect, EPZs in the Philippines



unable to stop this practice. The degree of product differentiation of goods produced and used in the zone is such that the use of check-pricing methods to detect transfer pricing practices is ineffective.

#### Non-fiscal incentives

In common with BOI-registered firms outside the zone, EPZ firms are permitted to employ foreign nationals, free of Philippine personal income tax obligations, in supervisory, technical or advisory positions. On the other hand, EPZ firms are unrestricted in their degree of foreign ownership, whereas BOI-registered firms are officially limited to a maximum of 40 per cent foreign ownership (except for firms granted "Pioneer Status"), which must be reached within a pre-determined period, and are also required to locate within a 50 kilometer radius from central Manila.

EPZ firms share the favourable treatment granted to BOI-registered firms with regard to: allocation of concessionary government guaranteed loans, a matter which will be important for our latter discussion; priority in the allocation of foreign exchange for imports of capital equipment, intermediate inputs and raw materials; guaranteed freedom to remit profits and dividends at any time, at prevailing exchange rates; and (government) guaranteed freedom from uncompensated expropriation and requisition. Remitted profits are subject to a 15 per cent withholding tax. EPZ firms are also entitled to a share of the

Philippines' allocation of import quotas, a provision which is important for garment exporters. The provisions for "tailor-made" tariff protection of BOI-registered foreign firms producing at least partly for the local market do not apply to firms in the EPZ, but EPZ firms are treated more favourably than firms outside the zone in other respects.

From the point of view of the investing firm the most important advantage from locating inside the zone rather than elsewhere is the fact that EPZ firms are served by a separate administrative branch of the government (EPZA) which has power to act as an intermediary between the firm and (most of) the rest of the government. This one-stop administration reduces firms' administrative costs. Simplified import and export documentation is also available to firms operating inside the zone. EPZ firms are also eligible for government assistance in local manpower training and foreign market development. Firms locating inside the zone can take advantage of the somewhat superior infrastructive facilities available in the zone and can occupy the standard government factory buildings if they wish. On the other hand, the value of these advantages is considerably reduced by the location of the zone in Mariveles. Communications with Manila and the outside world remain poor and unreliable.

#### IV. ECONOMIC CHARACTERISTICS OF THE ZONE

##### A. Aggregate Economic Performance

Table 1 summarises the overall economic performance of the

Bataan zone using statistics provided by EPZA. Employment in the zone grew through the mid 1970s to just under 20,000 persons and has since stabilised at about that level. Table 2 disaggregates this total employment by industry. Throughout most of the period garment firms have been the largest employers. Electronics became increasingly important in the late 1970s. This trend, of initial dependence on garment exports, but with electronics becoming increasingly important, has also been the experience with EPZs in other Asian countries.<sup>6</sup>

Of the 33 EPZ firms surveyed by the Investment Coordination Committee in 1979, 9 were Filipino-owned, 13 were joint Filipino-foreign ventures and 11 were fully foreign-owned. Most of the Filipino firms were garment manufacturers. The joint ventures included six Filipino-Japanese firms involved in miscellaneous light manufacturing, three Filipino-British firms associated with Hong Kong Chinese firms, one in electronics and one in garments and two Filipino-European firms (one Norwegian and one German) producing miscellaneous manufactured goods and electronics. The foreign firms comprised two German garment producers, two American firms, including a glove manufacturer and a large toy maker. The other firms consisted of two from Japan and one firm from each of Australia, Austria, Canada, Korea and Taiwan, producing miscellaneous manufactures. In 1981 the American toy manufacturer was the largest employer in the zone.



National breakdowns of this sort are potentially misleading in that a foreign subsidiary of a multinational firm is often the nominal owner of an EPZ firm, rather than the parent company. An example is the Ford Philippines Stamping Plant, representing a total investment of around US\$35 million in 1981 and the third largest investment in the Bataan zone, which is officially listed as a Canadian investment. The growing proportion of firms coming from middle income developing countries, including Hong Kong, Taiwan and South Korea, is an interesting development. This second generation labour-intensive manufacturing development is a predictable response to rising labour costs in these countries, but it is also in part an attempt to overcome bilateral import restrictions, imposed by the EEC in particular, on exports from these countries. This is especially important in the case of garments. Moreover, some of these firms are in fact subsidiaries of American and European firms. Overall, both the degree of foreign ownership in general, and the degree of developed country ownership as a proportion of this, are higher than the officially stated national origins of firms suggest.

In part, the data in Table 1 illustrate the difficulty of controlling transfer pricing. In 1979 the total reported value of imported raw materials was 67 per cent of the total reported value of export sales. In 1980 this grew to 78 per cent. It was made known at that time that EPZA officials were suspicious about the reported information and that a special audit of company records, with emphasis on the use of check-prices for

internationally traded goods, was imminent. In the first half of 1981 the reported value of imported raw materials fell to 52 per cent of reported exports. In private, firm managers admit that the information reported to EPZA reflects the efforts of the firms to minimize their tax burden. This does not only apply to official company income tax, but it is said that a firm which is seen to be highly profitable is in danger of attracting various forms of "unofficial taxes" as well.

One of the benefits hoped for in the establishment of the zone was the development of backward linkages with the local economy through the supply of raw materials and semi-processed goods. Company income tax advantages are offered to encourage these linkages. The absolute value of local raw materials used increased to around US\$10 million per annum by 1980. As a proportion of reported total raw material usage, domestic raw material accounted for 16 per cent by value over the three year period 1972 to 1974, rose to 19 per cent over the next three years and declined to 10 per cent over the three year period to 1980. By 1982 it was only 6 per cent.

Firm managers report that the inconsistent quality of locally purchased raw materials is the main obstacle to their use in the zone. Entire shipments of finished goods can be, and sometimes are, rejected by foreign buyers if raw materials of inferior or uneven quality have been used. But another important factor is the changing industrial composition of the EPZ.

Industries like garment and footwear manufacture, which tend to use relatively high proportions of domestic raw material (around 20 and 15 per cent of total raw material use, respectively) have declined in relative importance within the zone, whereas industries like electronics and optical products, using less than one per cent local raw materials, have grown in relative importance.

#### B. Source of Private Investment

Another benefit the zone was expected to generate was an inflow of foreign investment. The record here is particularly startling. Most of the capital invested in the zone has in fact been raised domestically. The available data,<sup>7</sup> covering the period up to 1977, inclusive, are summarised in Table 2. Of the total private capital of ₱1,554 million (roughly US\$210 million at the 1977 exchange rate) invested in the zone up to 1977, ₱99 million (6.4 per cent of the total) consisted of equity and ₱1,455 million of borrowings. Of the equity, 74 per cent was domestic and 26 per cent foreign, and of the borrowings, 92 per cent were domestic and 8 per cent foreign. That is, fully 91 per cent of the total capital invested was raised domestically, and domestic borrowings accounted for 95 per cent of these domestically raised funds.

This situation arose from the package of incentives, including access to the local capital market with government guarantees of borrowings, introduced shortly after the declaration of Martial Law in 1972. Obviously, in a country like



the Philippines, whose future political stability cannot be assumed, the possibility of capital loss through expropriation or other major policy changes unfavourable to foreign firms is a major determinant of these firms' investment decisions. Government-supported access to the local capital market, in which interest rates are deliberately suppressed, has obvious attractions, and in retrospect it is hardly surprising that the foreign firms have utilised it heavily.<sup>8</sup>

The phenomenon of extensive reliance by foreign firms on domestic sources of finance had already been recognised by the Philippine authorities in 1970, before the opening of the EPZ. Between then and 1972 a bill was prepared by the Philippine Congress which would have restricted this access, reportedly patterned on similar legislation in Australia (Espiritu 1979, p.42). Martial Law ensued before the bill could be enacted. In the post-Martial Law period the government's eagerness to improve the Philippines' reputation among potential foreign investors led it to abandon any such planned restrictions and indeed to expand the granting of government guarantees of these loans instead. The longer term consequences were apparently not fully anticipated.

Restrictions on foreign firms' access to the domestic capital market were introduced in 1977 and began to become effective in the following year. These regulations, which took the form of ceilings on the officially permitted debt/equity

ratios of foreign firms, were a response to the extensive use of the local credit market by foreign firms both inside and outside the EPZ.<sup>9</sup> It is unclear how effective the new policy has been.<sup>10</sup> For our purposes, the significant point is that the restrictions were mild and did not become effective until after most of the investment activity in the zone had already occurred.

### C. Employment Conditions and Wages

Criticism of EPZs on the part of writers from the industrialised countries has generally focussed upon employment conditions and wages provided in the zones. Unfortunately, this criticism has not always reflected familiarity with employment conditions and wages elsewhere in the LDCs concerned. The criticism has frequently rested on the comparison between a somewhat exaggerated picture of harsh employment conditions and low wages in the EPZs on the one hand and the much more favourable conditions obtaining in similar industries in the industrialised countries on the other. This perspective is often combined with insistence that the multinational firms operating in the zones are "exploiting" their EPZ workers at the expense of potential employment in similar labour-intensive industries in the industrialized countries. The possibility that the EPZ workers concerned are better off with the opportunity of being "exploited" in this way than they would be in its absence warrants more serious consideration than the critics generally provide.

Labour costs are obviously of major importance for the labour intensive manufacturing activities conducted in export processing zones. Among developing countries establishing EPZs, the Philippines is an intermediate labour cost country. Minimum wage laws are generally policed within the zone.<sup>11</sup> Whereas manufacturing firms located outside the EPZ can often evade these regulations, this is substantially more difficult within it. Safety and health regulations are not so effectively policed, but standards are generally above those seen by the author in manufacturing establishments elsewhere in the Philippines among both foreign and domestic firms. Wages, compulsory fringe benefits, social security, and medical and accident insurance fund contributions summed to around P10,300 per worker per annum in 1982, or P37 per productive day (assuming a 280 day year). This converts to roughly US\$4.00 per day and can be compared with total labour costs of around US\$7.20 per day for unskilled and semi-skilled female workers in the Masan and Iri Export Processing Zones in South Korea and, at the other extreme, around US\$1.00 to US\$1.20 in the export processing zones in Jakarta, Indonesia and Katunayake, Sri Lanka.

Evidence on the characteristics of the EPZ workforce and on wages paid in the EPZ is presented by Castro (1982). Zone workers are predominantly female (74 per cent of total employment), especially in the unskilled and semi-skilled categories; unmarried (two thirds of Castro's 1980 sample); and typically belong to the age group 17 to 24. Most workers (64 per cent of those surveyed by Castro) are without previous factory



experience. Turnover rates are relatively high and the average duration of zone employment is around 3 years. Considering the unskilled and semi-skilled nature of their work in the zone, EPZ workers are relatively well-educated. Sixty per cent of Castro's sample were high school graduates and one sixth had received post-secondary education.<sup>12</sup> Castro's survey indicates that most zone workers (81 per cent of her sample) were temporarily absent members of larger households, the average size of which was six members. The average monthly earnings of zone workers in her 1980 sample was P780 and this comprised roughly half of the average combined monthly earnings of their households of P1592.

Of the workers surveyed by Castro in 1980, 36 per cent had worked previously in paid employment. The previous earnings of this group, expressed in 1980 prices, averaged P 22.6 per day and this compared with their average 1980 EPZ earnings of P 30.5. Castro concludes that there was a clear income gain in moving to a job in the zone. According to Castro's survey almost half of all workers worked overtime and the average number of hours worked per week was 54, whereas 60 hours was the average for those who worked overtime.

A survey of 32 firms inside and outside the EPZ conducted by the Ministry of Trade and Industry in 1982 indicates that wages paid in the Bataan zone are slightly below those paid in similar industries in Metropolitan Manila in the case of unskilled

workers and roughly the same in the case of skilled workers. The results are summarised in Table 3. The composition of these wages is indicated in Table 4 and compared with the legislated minimum wage payments. It must be noted that living costs, and especially housing costs, are higher in Metropolitan Manila than in Mariveles, and the above data can be summarised as indicating that real wages for unskilled workers are roughly the same in the Bataan EPZ as in comparable employment in Metropolitan Manila, whereas real wages for skilled workers are somewhat higher in the EPZ.

#### D. Infrastructure Costs, Administrative Costs and Revenues

Table 5 presents the data assembled by the Investment Coordination Committee on the costs incurred by the government in setting up the zone. They do not include the unimproved value of the land occupied by the industrial area of the zone (345 hectares) or some expenditures in support of the zone but incurred outside its immediate vicinity. These omissions include some expenditures on port development and improvements of the road connecting Mariveles to the main highway system. For the years following 1978 data were available only on a cumulative basis, for 1979 to 1981, inclusive.

The revenues received by EPZA and other government agencies from firms in the Bataan zone and operating expenses of EPZA are summarised in Table 6. Company income tax collections are received by the Bureau of Internal Revenue, rather than EPZA. The first three rows give the operating costs incurred by EPZA in administering the zone.<sup>13</sup> Salaries of EPZA employees are the

major item in most years, followed by power costs.<sup>14</sup> An imputed rental on EPZA-owned prime office space in Manila is given in the fourth row.

#### V. ECONOMIC EVALUATION: COMPONENTS

Some of the government's objectives in establishing the EPZ have indeed been achieved; others have not. But have the economic benefits derived justified the domestic resources and public expenditure that the zone has absorbed? For this question to be answered the observed situation in which the zone exists must be compared with the hypothetical situation in which it is absent. The aim is thus to identify the net economic benefits and costs, as experienced by the Philippine population, resulting from the existence of the zone. The analysis will disregard income distributional considerations within the Philippines. That is, changes in incomes of Philippine nationals are weighted equally but changes in the incomes of foreigners receive zero weighting. The present section sets out the general approach to be followed in the effort to answer this question. The analysis treats the EPZ as an enclave within the Philippine economy and the focus is thus placed upon the transfer of funds and resources between it and the rest of the Philippine economy.

It must be stressed that the data base for all these calculations is such that only rough orders of magnitude of the main components of benefits and costs can be expected. Sweeping assumptions cannot be avoided and in these cases an effort has



been made to ensure that errors favouring the social profitability of the EPZ are if anything more likely than the reverse. This section explains the individual components of the economic evaluation and illustrates the contribution of each to the overall evaluation by presenting the calculations for that component corresponding to 1982. The following section gives the overall results. The numeraire of measurement is the value of consumption, measured in the domestic currency and expressed in 1982 prices. The notation Pxm. is used to denote x million Philippine pesos.

### Employment

The government's concern for the employment generated in the zone obviously reflects the view that the social benefits derived from generating an additional job outweigh the costs. This may be interpreted as meaning that the wage received by the worker exceeds the opportunity cost of his or her employment in the zone. Considering that the majority of the workers in the zone are females in the age group 17-24 years without previous experience in formal employment, the measurement of their opportunity cost is especially difficult. If they were not employed in the EPZ, many of these women would have remained in their villages, working in their family households.

Estimates of the opportunity cost of unskilled and semi-skilled labour in the Philippines [Medalla and Power, 1984: 50]

lie in the range of 54 to 66 per cent of the legal minimum wage.<sup>15</sup> The opportunity cost of each unskilled and semi-skilled worker attracted to the zone is thus taken to be 60 per cent of the wage actually paid to factory workers in the zone. The total opportunity cost attributed to the employment of these workers will nevertheless exceed 60 per cent of the actual wage bill because at any time a significant proportion of the zone labour force is unemployed.

The economic life of Mariveles is dominated by the EPZ. Unemployment within the Mariveles town area occurs both because of labour turnover within the zone and because the employment opportunities provided by the zone attract more job aspirants than can be absorbed. The isolation of Mariveles is such that most of these workers are reduced to washing, cleaning and cooking for those in employment while waiting for a chance to find full time jobs themselves. Many return to their home provinces in disappointment, only to be replaced by others. In this respect an isolated enclave like the Bataan EPZ provides a classic illustration of the migration phenomena described by Harris and Todaro. But the size of the pool of employed is smaller than the conventional Harris-Todaro analysis would predict.<sup>16</sup>

On the basis of labour force surveys, zone administrators and Mariveles municipal officials estimate this pool of semi-idle labour to be about 2,200 persons, or roughly 10 per cent of the total number of workers in the zone (11 per cent of the employed workforce). Their incomes while unemployed are said to average

only about one quarter of full time wages. If the opportunity cost of these workers is also 60 per cent of the full time wage, then proceeding along the Harris-Todaro lines this increases the overall opportunity cost of direct factory labour to 64 per cent of the wage bill.

The wage data in Table 1 include salaries of Philippine managerial and supervisory personnel, but salaries of foreign managerial personnel are excluded. The opportunity cost of all workers is taken to be 64 per cent of wages received. In the case of Philippine managers and supervisors, this rests on the crude assumption that the value of training received is 36 per cent of the wage received. In 1982 the net benefit from employment is thus estimated at 36 per cent of the total wage bill of P199m., or P71.8m.

#### Foreign Exchange Earnings

The foreign exchange earnings of foreign-owned firms in the zone constitute the net outcome of transactions between firms in the zone and firms abroad. To a first order of approximation, transactions of this sort are irrelevant for the calculation of the host country's net gain from the zone because the foreign exchange is owned by the (foreign) EPZ firms themselves and not by citizens of the host country. But in the circumstance where these declared net foreign exchange receipts must be deposited with the central bank of the host country, and where exchange controls and domestic protection imply that the social value of foreign exchange in terms of the domestic currency exceeds the



official exchange rate, the requirement that these funds be deposited with the central bank constitutes, in effect, a form of taxation.

In the case of the Philippines, the foreign firm retains ownership of these Central Bank deposits. They are denominated in domestic currency, converted at the official exchange rate, but may in principle be repatriated as profit in foreign exchange, also converted at the official exchange rate, at any time. To be eligible to repatriate profit, a firm must declare such a profit, and pay company income tax on it. Consequently, although EPZ firms generally deposit substantial net foreign exchange earnings with the Central Bank, they typically declare overall trading losses. That is, the value in domestic currency of these net foreign exchange earnings is exceeded by net losses incurred on transactions conducted locally in the domestic currency. These losses are the value of wages paid plus local raw material used minus the value of local sales of finished goods. In fact, formal repatriation of profit has seldom occurred, and the total amounts involved are trivial.

Of course, EPZ firms draw on their Central Bank deposits to meet their domestic payments. In the meantime, the Central Bank has at its disposal foreign exchange whose social value exceeds the value of the domestic currency which the firms are given in exchange. The "value of the domestic currency" which firms are given for their foreign exchange must be understood to mean the domestic social value of the goods and services which the firms

purchase with it. The evaluation of the net economic impact of these transactions thus involves the calculation of, on the one hand, the social value of the additional traded goods which the Philippines is able to absorb from the foreign exchange received from EPZ firms compared with, on the other hand, the social value of the goods and services given up by the Philippines (purchased by EPZ firms with the domestic currency they receive from the Central Bank) in exchange for it.

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 Philippines is able to absorb as a result of the 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 firm 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.

Due to transfer pricing, the firms' true foreign exchange earnings from the zone will presumably exceed their declared foreign exchange earnings, as indicated in Table 1. But the declared earnings represent the deposits made with the Central Bank and are therefore the relevant quantity to look at in an ex

post measurement of the Philippines' actual foreign exchange earnings from the EPZ.

Estimates of the degree of overvaluation of the Philippine peso are given in Medalla and Power (1984). They reflect: (a) the estimated effects that legal rates of tariffs and other taxes have on the domestic prices of traded commodities, and (b) the existence of persistent balance of payments deficits, especially in the late 1970s and early 1980s. The ratio of the shadow price of foreign exchange to the official exchange rate, as estimated by these authors, reflect an estimated adjustment factor of 1.114 to account for protection and an adjustment factor of 1.081 to account for balance of payments deficits. This gives an overall ratio of the shadow exchange rate to the official rate of 1.204, the product of these two numbers.

This estimate of the difference between the shadow price of foreign exchange and the official exchange rate is likely to be understated. First, Medalla and Power's estimates of the effect of protection apparently make no allowance for quantitative restrictions, and these are of considerable importance in the Philippines. Second, the estimated effects of disequilibrium in the balance of payments make no allowance for the effects of exchange controls, which act like quantitative restrictions on imports to raise the domestic prices of imported goods. Their effect is to reduce the magnitude of the balance of payments deficit which corresponds to a given overvaluation of the exchange rate.



Insofar as underestimation of the divergence between shadow and official exchange rates leads to the underestimation of the net benefit from the EPZ we shall use values of this ratio which exceed these given by Medalla and Power. The value 1.25 will be used as a base, but since this parameter is especially uncertain we shall vary it within the benefit-cost exercise to test the sensitivity of the results to it. For this base case foreign exchange earned by foreign firm and deposited with the Central Bank is thus taken to generate a net benefit to the Philippines of 25 per cent of its nominal value. This gives a net benefit in 1982 of P85.5m.

#### Technology Transfer

During the planning of the EPZ it was hoped that Philippine firms would benefit from the technological knowledge of foreign firms entering the zone. It is generally agreed among administrators of the zone that this has not occurred to any significant extent. First, most of the firms operating in the EPZ are involved in labour-intensive production and have very little technological knowledge to offer which is not already widely available. Second, the few firms which do have unique technological advantages protect their knowledge carefully. These firms, of which a few electronics firms are virtually the only examples, are apparently concerned to ensure that their Japanese, European or American competitors (also present in the EPZ) do not gain access to their technological secrets. These

are, after all, valuable company assets.

On the other hand, managerial techniques and methods of product quality control are inevitably transferred to the local middle level managers the firms employ. When these workers transfer to employment elsewhere the managerial training they have received confers a benefit to the domestic economy which is not captured in the wages these workers have received in the zone. One way of treating this is to say that the net social opportunity cost of the employment of these workers in the EPZ is lowered by such training. For the purposes of benefit-cost analysis these externality effects can thus be captured in principle by adjusting downwards the opportunity cost of this category of labour. The fact that these managers can obtain significantly higher salaries elsewhere after employment by foreign firms in the zone suggests that these benefits do exist. 17

#### Domestic Borrowings

The major part of the private investment in the EPZ has been financed by borrowing on the Philippine capital market. To the extent that the marginal social productivity of capital exceeds commercial interest rates, this implies that the value of domestic Philippine output foregone as a result of such borrowings exceeds the compensation received from EPZ firms in the form of interest payments. That is, the shadow price of capital,  $S^K$ , will then exceed unity. Writing  $V_t$  for the amount of such borrowing in year  $t$ ,  $(S^K - 1)V_t$  captures the net loss to

the Philippines in year t which results.

Estimates of the marginal social rate of return to capital in the Philippines are reported in Manalaysay (1979). The most reliable and most conservative of these, as an indicator of the long run marginal cost of capital, is based on non-regulated stock yields in the commercial-industrial sector. These average 13.3 per cent in real terms and this converts to 13.6 per cent at border prices. Distortions in the labour market imply that the social rate of return to investment exceeds the private rate, and when Manalaysay adjusts for this the estimated social rate of return becomes 16.4 per cent. These calculations are based on Manalaysay's conservative assumption that the social opportunity cost of employing a worker in the private sector is 83 per cent of the market wage. A lower estimate of the opportunity cost of labour would imply a correspondingly higher social rate of return to capital. Taking the more conservative of Manalaysay's estimates of the social rate of discount and the marginal propensity to reinvest, this implies a lower bound to the shadow price of capital for the Philippines of 1.58. The estimated net welfare loss to the Philippines from 1982 domestic borrowings of EPZ firms of P14.1m. is thus 58 per cent of this amount, or P 8.2m. 18

#### Domestic Raw Material Inputs

The government wishes to encourage the use of domestically produced raw materials and intermediate inputs in the zone,



implying that the price paid by firms for these materials is judged to exceed the social cost of providing them. To facilitate this the government provides user firms in the EPZ with a rebate in principle equivalent to the duty and other tax content of these raw materials themselves or of the imported inputs embodied in their production. If the domestically produced raw materials used in the EPZ are themselves internationally traded at the margin the social opportunity cost of providing them to the EPZ is given by their border (c.i.f. or f.o.b.) prices; taking the rebate into account there is then no net gain to the Philippines from their use in the EPZ.

If the raw materials are non-traded the social opportunity cost of providing them is given by a weighted average of their user prices and the marginal social cost of producing them, the weights reflecting their compensated elasticities of demand and supply.<sup>19</sup> The marginal social cost of production will differ from the price at which the goods are sold due to distortions in labour, capital and traded input markets. Again, the tax rebate in principle cancels out the traded input distortion, but labour and capital market distortions remain. These imply, respectively, a downward and an upward adjustment to the market prices of the goods in the calculation of their marginal social cost of production.

From manufacturing census survey data it is possible to find the share of labour in the value of output of industries

supplying raw materials to the EPZ, but incremental capital-output ratios raise greater difficulties. Clearly, if marginal capital requirements were ignored in the calculation an upper bound to the net gain from the use of domestic raw materials in the EPZ would be obtained, and this is the procedure we shall follow. The weighted average share of employee compensation in the value of output of industries supplying raw materials to the EPZ is roughly 10.3 per cent.<sup>20</sup> Together with the estimated divergence between wages and the opportunity cost of labour discussed earlier this implies that an upper bound to the net gain to the Philippines from the use of domestic raw materials in the EPZ is approximately 3.7 per cent of the value of raw material used, or in 1982 ₱2.9m.

#### Domestic Sales

Zone firms are officially permitted to sell up to a maximum of 30 per cent of their output in any year on the domestic market, subject to government approval in each case, although even this upper limit has occasionally been relaxed. Most of the goods produced in the EPZ are subject to high import duties in the Philippines and domestic sales enable EPZ firms to sell at the tariff-inclusive price. This means, in effect, that the firm is able to collect the tariff revenue which would otherwise have been paid on the equivalent quantity of imports; but these domestic sales are treated by the Philippines customs authorities as if they were imports and EPZ firms are required to pay the corresponding duty.

The net value to the Philippines of the goods purchased in this way is the net opportunity cost of imports, as given by their border (c.i.f.) prices, but this is also the net price the EPZ firms receive for them. There is in principle no net gain or loss to the Philippines. On the other hand, when protection takes the form of quantitative restrictions, domestic sales from the EPZ are equivalent to relaxation of quotas by the amount of the sales. Local sales do not displace imports in this case, but are additional to them. The price paid by Philippine consumers for these goods is then equal to their marginal value and these sales also have no net welfare effect.

### Electricity

The EPZ is a heavy user of electrical power. The EPZ is linked to the Luzon grid of the National Power Corporation and rates charged to commercial users are known to be below long run marginal costs. A World Bank study has estimated that in Luzon commercial rates are 77 per cent of long run marginal cost, the latter including both capacity expansion and energy costs of additional power generation.<sup>21</sup> For 1982 this implies a subsidy of 23 per cent of total electricity use of P19.4m., or P 4.5m., counted as a net cost of the EPZ.

### Firms' Profits and Losses

If all firms were fully foreign-owned, their profits and losses as such would be irrelevant for an economic evaluation of



the zone which takes the national economic interests of the Philippines as its frame of reference. Only the transactions, broadly conceived, between these firms and the local economy would be considered. The profits and losses of such firms are changes in the incomes of foreigners and thus would not be counted, whereas the profits and losses of domestic firms, would be relevant.

The domestically-owned proportion of profits and losses from firms in the zone cannot be estimated satisfactorily from the available data. First, the true domestic content is known to be smaller than nominal ownership records indicate. Second, partly because of the efforts of firms to minimize their tax burdens, profits are seldom officially declared. Most firms report losses, and this is especially true of firms listed as Filipino-owned. The high rate of turnover of firms suggests that very large profits are uncommon, but the fact that some firms consistently report losses over several years and yet continue to operate, and even expand, indicates that reported profits and losses are unreliable.

In this study, the firms in the zone will be treated as if they were fully foreign-owned. This assumption, though not strictly correct, simplifies the analysis greatly and is thought likely to lead to less error than the feasible alternatives. The profits and losses of these firms as such are consequently disregarded.

### Taxation

The taxes raised from firms in the EPZ are 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 zone from elsewhere in the Philippines, or foreign firms which would have entered the Philippines in any case, if the zone was not present, represent an exception. Taxes actually raised in the EPZ will therefore tend to overstate the net tax revenue effects of the EPZ, which could even be negative. In 1982 revenue of P 0.7m. was raised and this is counted as a net benefit; but since EPZ firms declaring losses carried over a net tax credit of P3.7m., this presumably overstates the net tax yield of the year's operations.

### Infrastructure Costs

Public expenditures required to set up the zone represent a clear economic cost. Some of these expenditures made in the zone area may have been required in the absence of the zone. Local roads are an example. Similarly, some public expenditures which would otherwise have been required elsewhere in the Philippines are reduced by the movement of population to the zone area. These include school facilities, public health facilities, etc. Consequently, looking at actual expenditures in the zone area will tend to overstate the net expenditure effects of the zone's existence. But the largest expenditures involved are in fact

specific to the EPZ. These include construction of government-supplied factories, electricity provision for factories, levelling the zone site, upgrading the port and dam construction. Expenditure diversion seems likely to be a small proportion of the total. Furthermore, the effect of this source of overstatement of public expenditure will in part be counteracted by the overstatement of tax revenue effects resulting from looking at actual tax receipts.

#### Administrative Cost and Revenues Raised

The main components of the administrative costs of the EPZ are the social opportunity costs of EPZA employees and foregone rent on EPZA office space. The total wage bill of EPZA employees will be taken to be the social opportunity cost of their employment by EPZA, giving a 1982 total cost of P15.6m. and total administrative costs sum to P23.5m. Revenues raised, a net benefit, totalled P13.1m.

### VI ECONOMIC EVALUATION: RESULTS

#### A. Estimated Benefits and Costs

The various annual components of the economic evaluation, constructed along the principles discussed in the previous section, are summarised in Table 7, expressed in constant 1982 prices. To assess the overall benefits and costs of the EPZ, some projection of its operations into the future is required. The zone is assumed to operate until 1982 as indicated in Table



1, and then to continue operating in subsequent years as it did in 1982.<sup>22</sup>

Considering that Philippine public expenditure during the 1970s was financed at the margin largely by international borrowing we take real rates of interest on these loans to be an appropriate real discount rate.<sup>23</sup> This real interest rate is estimated to have averaged approximately 5.6 per cent over the present life of the zone.<sup>24</sup> Table 8 summarises the results of the benefit-cost analysis using this discount rate and others lying within the seemingly feasible range around it. The table also shows the effect of varying the ratio of the estimated opportunity cost of labour to the wage paid and also the economic life of the zone. Table 9 similarly shows the effect of varying the estimated shadow prices of capital and foreign exchange. Except where otherwise indicated the calculations reported in Tables 8 and 9 are based upon the shadow price estimates discussed in the previous section, a real discount rate of 5.6 per cent and an assumed life for the zone of 25 years.<sup>25</sup> We shall subsequently refer to their combination of parameters as the base case.

Under all combinations of assumptions examined the zone generates negative net present value. Equivalently, it generates an internal rate of return below the estimated real discount rate. Indeed, in almost all cases the internal rate of return is negative. In the central case we find a net present value of P-

3.5 billion and an internal rate of return of -3 per cent.

The composition of the net present value of P=3,474m. estimated in the base case is as follows: employment, P1,148m.; foreign exchange earnings P1,390 m.; domestic raw material use P 54m.; electricity subsidy P-71m.; administrative costs P447 m.; revenue raised P215m.; and infrastructure costs P-3,272m. The estimated loss to the Philippines from domestic borrowings of foreign firms is itself large enough to cancel all but two per cent of the total gain from employment generation and foreign exchange earnings. But even if this source of loss to the Philippines were ignored the zone would still generate a large negative net present value.

#### B. Omissions and Biases

Simplifying assumptions have been necessary in this study, but errors biasing the estimated social profitability of the EPZ upwards seem more likely than the reverse. These include the following.<sup>26</sup>

(a) It was assumed that EPZ firms which entered the EPZ would not have been present in the Philippines in the absence of the zone. In fact, some (but not many) of these firms would presumably have invested elsewhere in the country anyway.

(b) Some infrastructive costs of establishing the EPZ were omitted, including upgrading road connections to the main highway system, and infrastructure costs were assumed to be zero from 1982 onwards.

(c) Actual domestic borrowings of EPZ firms from 1978 onwards were assumed to be equal to official approved borrowings, and this almost certainly understates them.

(d) Available estimates of the most important shadow prices for the Philippines leave considerable latitude for judgement. Estimated net benefits from the EPZ are an increasing function of the estimated shadow price of foreign exchange and a decreasing function of the estimated opportunity costs of labour and capital. Within the seemingly feasible range for these shadow prices, judgements were made which favoured the estimated net returns from the zone.

## VII. CONCLUSIONS

In essence, export processing zones can be thought of as a form of labour export. It is no coincidence that the Asian countries which have experimented with the zones have also been engaged at the same time in direct export of skilled and unskilled labour to the Middle East and elsewhere. The degree to which EPZ activities are linked to the domestic economy is so small that the workers can be thought of as working essentially outside the country. But the case of the Bataan EPZ shows that when export processing zones are used as the vehicle for the export of abundant labour they are capable of leading to the wastage of scarce public and private sector capital on a massive scale, and of reducing economic welfare.

In the Bataan case public capital was wasted both through



the excessive public expenditure required to establish an industrial centre in such an isolated and mountainous coastal area as Mariveles and also because a significant part of the expenditure proved to have been unnecessary anyway. This included the upgrading of the port, subsequently not used to service the EPZ, and the construction of a large modern office building, subsequently underutilised when central administrative functions were transferred to Manila. In addition, private capital was diverted from the Philippine capital market to the predominantly foreign firms operating in the Bataan zone through the government's policy of permitting, even encouraging, EPZ firms to use this source of finance. In the first six years of the zone fully 91 per cent of all private investment in the EPZ was financed in this way. The Bataan EPZ thus largely represents not foreign investment but diversion of scarce capital from alternative investments elsewhere within the country.

In the period following the declaration of Martial Law in 1972 the Bataan EPZ was seen by the Philippine government as a 'showcase'. It was hoped that the zone would attract internationally mobile light manufacturing producers to the Philippines and that this would promote the economic development of the country. Unfortunately, neither of these aims was realised. Far fewer firms located in the zone than were expected and the form of development which did occur did not promote the country's development.

# FOOTNOTES

<sup>1</sup>Another large zone is under construction in Cavite, adjacent to Metropolitan Manila. Construction was temporarily suspended during the financial crisis of 1983 and this situation still existed in September 1984.

<sup>2</sup>See, for example, Chara (1979), Utrecht (1979), Castro (1982), Edgren (1982) and von Burgsdorff *et.al.* (1982).

<sup>3</sup>An interesting account of the political manoeuvring which accompanied the decision to locate the zone in Mariveles is given by von Burgsdorff *et.al.* (1982, pp.32-34).

<sup>4</sup>Export Processing Zone Authority, Project Report BEPZ, Volume 1, Manila 1974.

<sup>5</sup>The proportions of those EPZ firms submitting the required annual financial statement who declared overall trading losses in these statements were: 1980, 58 per cent; 1981, 81 per cent; 1982, 75 per cent; and 1983, 64 per cent. (Source: EPZA, September, 1984).

<sup>6</sup>See, for example, Warr (1983) and Spinanger (1984).

<sup>7</sup>These data were assembled in a government study of the Bataan EPZ, concentrating on statistical compilations, conducted by the National Economic and Development Authority [Investment Coordination Committee, 1980].

<sup>8</sup>This phenomenon has been noted in Latin America by Diaz-Alejandro (1970, pp.326-327) and Barnett and Müller (1974, pp.152-153), who cite earlier studies indicating that during the 1960s US-based corporations financed around 80 per cent of their Latin American investment locally, either from reinvested earnings or from local savings.

<sup>9</sup>This phenomenon does not appear to have been well-studied in the Philippines. It is noted, by means of anecdotal evidence on local borrowings by individual US-based corporations, in Espiritu (1979, pp.41-45), and by Villegas (1983, p.11), who refers to Philippine Central Bank statistics suggesting that between 1972 and 1976 total foreign direct investment in the Philippines summed to US\$0.5 billion, whereas local borrowings of foreign firms from commercial banks summed to US\$12.4 billion.

<sup>10</sup>Data provided by the Central Bank's Inter-Agency Committee on Domestic Borrowings of Foreign Firms indicate that as of the end of 1982 eight Bataan EPZ firms had received authorisation to borrow under the revised regulations (Central Bank Circular

No.572, 1977, as amended), the total value of which summed to P 70.5 million. The total for all foreign firms is reported as P 5,124 million. Private sources suggest that substantial borrowings occur outside the regulations.

<sup>11</sup>Firms may apply for Presidential exemption from these regulations and in October 1983 two firms, one Filipino-owned and one Hong Kong-owned, had been granted such exemptions.

<sup>12</sup>Castro points out that her sample was somewhat biased by the fact that males were over-represented. Females comprised only 55 per cent of workers surveyed whereas their share of total zone employment was 74 per cent.

<sup>13</sup>A difficulty in assembling these data was the fact that many of EPZA's expenses cannot readily be assigned between the three existing EPZs. Central administrative costs are the main example. In such cases an arbitrary rule is required. The proportion of all EPZA personnel employed outside Manila who were assigned to the Bataan EPZ was 69 per cent in 1982. It was assumed that the Bataan EPZ's share of all EPZA administrative costs which cannot readily be assigned between the zones was 69 per cent from 1978 onwards (to allow for the planning and construction phase of the two recent zones) and 100 per cent before that. This procedure almost certainly understates the zone's costs from 1978 onwards. This explains the absolute decline in personnel costs shown between 1977 and 1978.

<sup>14</sup>On this, see note a to Table 6.

<sup>15</sup>Medalla and Power adjust the shadow price of labour separately for the existence of 'sub-optimal savings'. This line of reasoning is neglected here for the reasons given in Warr (1984). Allowing for such an adjustment would reduce the estimated benefit from the EPZ.

<sup>16</sup>With the marginal product of a worker equal to 60 per cent of the EPZ wage, the standard Harris-Todaro "labour turnover" model would predict a total workforce equal to 1.67 times the number of jobs and thus a pool of unemployed equal to 13,333 persons.

<sup>17</sup>von Burgsdorff et.al. (1982, pp.137-142) provide a more detailed discussion of this point, leading to the conclusion that the gains to the Philippines from this source have been 'insignificant'.

<sup>18</sup>Borrowings in 1982 are estimated by taking total officially approved borrowings from 1978 to 1982 inclusive of P70.2 m. (see footnote 10) and dividing by five. This almost certainly leads to an underestimate because not all such borrowings are officially approved.

<sup>19</sup>See Warr (1982).



20 This is based on 1978 manufacturing census data for the three most important domestic raw material supplying industries for the EPZ. These industries, together with their census codes are: "textile manufacture" (321), "manufacture of leather and leather substitutes" (323), and "manufacture of machinery, non-electrical" (382). The individual wage shares of these industries were 11.3, 10.3 and 8.0 per cent, respectively, and the weights used in the calculation were their relative shares in the value of raw material use in the EPZ. (Source: 1978 Census of Manufacturing Establishments, National Census and Statistics Office, Manila.)

21 World Bank, "Philippines Energy Sector Survey, Vol. 1: Main Report", Washington, February 1982, Report No. 3199A-PH, pp.25-27.

22 In view of the political and economic turmoil of 1983 that year would presumably not be a suitable basis for such a projection.

23 For further theoretical discussion of this point see Warr and Wright (1981).

24 Estimated by taking the average U.S. Prime Rate from 1973 to 1982 of 11.4 per cent (International Currency Review, 1983) adding a risk premium of one percentage point and deflating by the average rate of increase of the export unit value index for industrial countries expressed in U.S.\$ of 6.8 per cent (International Monetary Fund, International Financial Statistics, various issues).

25 The zone life assumption means that the stream of net benefits is assumed to be constant in real terms at its 1982 value from 1982 until 1996 and then to become zero. It will be recalled that infrastructure costs are assumed to be zero from 1982 onwards.

26 On the other side of this ledger, the EPZ firms were treated as being entirely foreign and the domestically-owned proportion of firms' profits and losses was consequently disregarded. This omission presumably leads to some downward bias in the measurement of net benefits but it seems certain to be far outweighed by the items listed above.

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Table 1 Bataan EPZ: Overview of Economic Performance

	Units <sup>a</sup>	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
No. of Firms <sup>b</sup>	Firms	1	5	14	16	39	38	47	51	51	52	52
Employment	Persons	n.a.	1,298	3,321	5,502	8,962	12,821	17,495	18,877	19,204	19,858	19,410
Average wage	P/yr.	n.a.	2,930	3,156	3,412	3,586	3,775	3,929	5,673	8,073	9,265	10,280
Exports	US\$m.	0.4	0.9	2.1	7.3	22.4	39.7	73.1	98.2	122.7	134.0	159.6
Local sales	Pn.	n.a.	26.2	47.9	32.0	86.8	100.4	109.2	122.5	101.2	67.4	45.7
Imports of raw material	US\$m.	0.2	0.5	2.9	7.8	15.8	38.5	47.3	66.4	77.3	81.2	122.3
Local raw materials	Pn.	0.5	1.5	1.8	6.2	31.0	72.9	27.8	58.8	72.0	61.0	78.0
Local raw material/ Total raw material	%	29.8	30.5	8.2	9.5	20.8	20.4	7.4	11.3	13.5	8.8	6.4
Value added	Pn.	1.1	30.5	40.4	21.8	105.0	39.6	169.2	302.0	341.8	514.1	477.9
Value added per worker	P'000/ wkr.	n.a.	23.5	12.2	4.0	11.7	3.1	9.1	16.0	17.7	25.9	24.6
Export per worker	US\$/wkr.	n.a.	693	632	1,327	2,499	3,096	4,178	5,202	6,389	6,750	8,223
Export-import per worker	US\$/wkr.	n.a.	316	-240	-90	736	94	1,475	1,896	2,364	2,659	1,922

Source: Export Processing Zone Authority, Manila; and Investment Coordination Committee (1980).

Notes: a All monetary amounts are in current prices.

b Operational firms only. In the years 1978 to 1982 total occupancy was 50, 53, 56, 54 and 52 firms respectively.

Table 2 Bataan EPZ: Sources of Finance of Zone Firms, 1972 to 1977  
(Millions, current prices)

Industry	Equity Investment <sup>a</sup>			Borrowings <sup>b</sup>			Total Investment		
	Foreign	Domestic	Total	Foreign	Domestic	Total	Foreign	Domestic	Total
Textiles	0	40.0	40.0	10.2	133.1	143.3	10.2	173.1	183.3
Footwear	2.7	4.1	6.8	4.4	99.1	103.5	7.1	103.2	110.3
Garments and other apparel	10.9	11.4	22.3	7.8	94.1	101.9	18.7	105.5	124.2
Metal and wood products	0	15.6	15.6	69.8	9.6	79.4	69.8	25.2	95.0
Metal products	0.1	1.0	1.1	0.2	1.8	2.0	0.3	2.8	3.1
Electronics	0	0.9	0.9	1.0	6.5	7.5	1.0	7.4	8.4
Transport equipment	4.2	0	4.2	14.4	987.9	1002.3	18.6	1006.5	1025.1
Miscellaneous manufactures	6.9	1.2	8.1	4.4	10.3	14.7	11.3	11.5	22.8
TOTAL	24.8	74.2	99.0	112.2	1342.4	1454.6	137.0	1416.6	1553.6

Source: Investment Coordination Committee (1980), pp.14-16 and Statistical Appendix, exhibits 7 to 12.

Notes: a Accumulated total of changes in enterprises paid up capital stock at the end of each year.

b Accumulated total of all new loans acquired by enterprises during each year.

Table 3 Mean Daily Wages, Metropolitan Manila and Bataan EPZ  
(Pesos per day, 1982 prices)

Industry Category	Unskilled Workers/Semi-skilled		Skilled Workers/Production Line Leaders	
	Metro Manila	Bataan EPZ	Metro Manila	Bataan EPZ
Garments/Apparel	48.86	32.53	60.22	44.91
Footwear	37.36	30.59	49.06	55.16
Electronics/Electrical products	38.51	31.29	41.92	36.08
Plastic/Leather products	30.38	31.94	45.45	37.11
Toys/Sporting goods	a	33.75	28.68	39.71
Food processing	30.27	47.31	40.71	54.22
Simple Mean	37.08	34.57	44.34	44.53
Weighted Mean <sup>b</sup>	36.09	32.16	44.79	42.72

Source: Ministry of Trade and Industry, "Comparative Review of Wage Rates in Export Processing Zone Enterprises and in Metro Manila", August 1982, mimeo.

Notes: a Not available because piece rates were used in the firms surveyed.

b Using 1982 shares of employment by industry in Bataan EPZ as weights.



**Table 4**      **Composition of Prevailing Mean Daily Wages and Legislated Minima,  
Unskilled and Semi-skilled Workers  
(Pesos per day, 1982 prices)**

	Metro Manila		Bataan EPZ	
	Legislated	Prevailing	Legislated	Prevailing
Basic Pay	18.00	24.24	17.00	18.86
Emergency living allowance	12.69	10.12	12.69	12.22
13th month pay	1.49	2.32	1.41	1.57
Other allowances	0	0.40	0	1.92
<b>Total</b>	<b>P 32.18</b>	<b>37.08</b>	<b>31.10</b>	<b>34.57</b>

Source: See Table 3.

Table 5 Bataan EPZ: Infrastructure Expenditure (Millions, current prices)

	1972-1974	1975	1976	1977	1978	1979-1981
Site preparation	79.9	66.0	54.1	21.5	22.9	0
Building	55.8	32.6	34.4	45.4	27.7	57.0
Power, electricity	16.9	16.4	17.9	5.4	7.2	73.6
Stormdrains and sewer system	3.6	3.3	1.9	3.7	1.6	14.8
Water supply system	68.8	55.5	64.3	30.1	15.5	0
Communication system	0	0	1.1	0	0	3.2
Housing structures	46.4	42.4	0	6.1	13.7	0
Port facilities	0	0	10.1	3.8	7.1	0
Recreational facilities	0	0	1.4	0	7.3	27.1
TOTAL	271.4	216.2	185.2	116.1	103.1	175.7

Source: Years to 1978, Investment Coordination Committee (1980), Exhibit 65. Years 1979 to 1981, inclusive, Export Processing Zone Authority, Manila.

Table 6 Bataan EPZ: Recurrent Government Costs and Revenues  
(P millions, current prices)

<u>Recurrent Costs</u>	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Personnel - wages and salaries	n.a.	2.21	3.68	4.77	6.27	7.74	6.51	7.99	10.02	12.36	15.58
Other administrative costs	n.a.	0.97	1.59	2.35	2.90	3.72	3.62	4.72	4.81	6.46	7.63
Power <sup>a</sup>	0	0.20	1.42	2.27	3.50	4.65	6.58	10.55	12.01	16.70	19.42
Buildings - imputed rental <sup>b</sup>	0	0	0	0	0	0	0.17	0.19	0.23	0.26	0.29
<u>Recurrent Revenues</u>											
Company income tax	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0.36	0.50	1.57	2.77	0.71 <sup>c</sup>
Real estate tax <sup>d</sup>	0	0	0	0	0	0	0	0.82	1.08	1.08	1.47
Land rental	0	0	n.a.	0.11	0.20	0.32	0.90	0.91	2.17	2.19	1.97
Building rental	0	0	0.23	0.87	1.31	2.02	5.10	7.11	6.34	6.39	8.96

Sources: Export Processing Zone Authority, Manila; EPZA, Annual Reports, various years; and von Burgdorff et.al (1982).

Notes: a Power is purchased by EPZA from the National Power Corporation and then sold to EPZ firms at almost the same rate. Only costs are shown here, but a similar revenue item is to be understood.

b Relates only to EPZA-owned prime office space in Manila and is based on commercial rental of similar office space in Manila. Disregards non-prime office space occupied by EPZA.

c Tax is collected only from firms declaring a net operating surplus. In 1982 aggregate operating surplus was negative (P-52 million) and the net aggregate tax credit this implied (a carry-over against future tax obligations) was P3.74 million.

d EPZA's share of real estate tax revenues is 50% so EPZA's data have been doubled to obtain aggregate revenue estimate presented here.



Table 7 Bataan EPZ: Components of Benefit-Cost Analysis(net gain<sup>a</sup>, P millions, 1982 prices<sup>b</sup>)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Employment	0	4.3	8.7	14.5	23.3	32.4	42.7	57.1	70.3	72.8	71.8
Foreign exchange earnings	1.1	2.1	-3.2	-1.9	24.7	4.1	82.3	87.2	108.7	119.1	85.5
Domestic borrowings <sup>c</sup>	-6.9	-112.4	-252.0	-512.9	-370.4	-382.1	-14.1	-12.1	-10.3	-9.0	-8.2
Domestic raw material use	0	0.3	0.2	0.4	2.2	5.0	1.7	3.3	3.4	2.5	2.9
Electricity subsidy	0	-0.3	-0.7	-1.1	-1.6	-2.0	-2.6	-3.6	-3.5	-4.2	-4.5
Administrative costs	0	-10.4	-12.1	-15.2	-18.4	-21.3	-17.8	-19.1	-19.0	-21.0	-23.5
Revenue raised	0	0	0.5	2.1	3.0	4.4	11.0	16.5	14.1	13.7	13.1
Infrastructure costs <sup>d</sup>	-317.7	-277.8	-208.5	-460.5	-372.3	-215.9	-178.4	-86.7	-73.8	-64.5	0
Net benefit	-323.5	-394.2	-467.1	-974.6	-709.5	-575.4	-75.2	42.6	89.9	109.4	137.1

Notes: a Positive items represent net benefits; negative items are net costs.

b Constant price calculations based on Philippine consumer price index published in International Monetary Fund, International Financial Statistics, various issues.

c Domestic borrowings for years 1972 to 1977 drawn from Investment Coordination Committee (1980). Data for individual years 1978 to 1982, inclusive, estimated by taking total approved borrowings in nominal terms to end 1982 (see footnote 10) and dividing by five.

d Infrastructure cost data for individual years 1979 to 1981 estimated by dividing total reported infrastructure cost in nominal terms for those years by three. Data were unavailable for 1982 and infrastructure expenditure were assumed to be zero.

Table 8 Bataan EPZ: Results of Benefit-Cost Analysis<sup>a</sup>

Shadow wage Market wage (%)	Net Present Value <sup>b</sup> (P million, 1982 prices)					Internal Rate of Return (%)		
	Real discount rate (%)					Life of zone (yrs.)		
	3.0	4.3	5.6	6.9	8.2	20	25	30
44	-1,708	-2,265	-2,836	-3,427	-4,042	-4.4	-1.0	0.8
54	-2,053	-2,596	-3,155	-3,737	-4,344	-5.6	-2.0	-0.1
64	-2,398	-2,927	-3,474	-4,046	-4,645	-6.7	-3.1	-1.0
74	-2,743	-3,258	-3,793	-4,355	-4,946	-8.3	-4.3	-2.1
84	-3,088	-3,589	-4,112	-4,664	-5,247	-10.0	-5.7	-3.3

Notes: a Except where otherwise indicated, results apply to a real discount rate of 5.6%, life of zone of 25 years, shadow price of labour equal to 64% of wage paid, shadow price of foreign exchange of 1.25 and shadow price of capital of 1.58.

b Results are presented in 1982 values. Thus net present values presented are equal to net present value discounted to 1972 and multiplied by  $(1+r)^{10}$ , where r is the real discount rate.

Table 9 Bataan EPZ: Results of Benefit-Cost Analysis (Continued)<sup>a</sup>

Shadow Price of Foreign Exchange	Net Present Value <sup>b</sup> (P million, 1992 prices)					Internal Rate of Return (%)		
	Shadow price of capital					Life of zone (yrs.)		
	1.38	1.48	1.58	1.68	1.78	20	25	30
1.0	-4,005	-4,434	-4,854	-5,293	-5,723	-15.4	-10.1	-7.1
1.125	-3,310	-3,740	-4,169	-4,599	-5,028	-10.3	-6.0	-3.5
1.25	-2,616	-3,045	-3,474	-3,904	-4,333	-6.7	-3.1	-1.0
1.375	-1,921	-2,350	-2,780	-3,209	-3,639	-4.2	-0.9	0.9
1.5	-1,226	-1,655	-2,085	-2,514	-2,944	-1.9	1.1	2.6

Notes: a,b, See Table 8.