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## Economic activity zones: Objectives and impact - some evidence from Asia

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# Kieler Arbeitspapiere

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Economic Activity Zones - Objectives and Im-  
pact - Some Evidence from Asia<sup>\*</sup>

by

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## I. Introduction<sup>1</sup>

In the course of the last quarter century increased attention has been drawn towards measures aimed at promoting economic growth by allowing economic activities to be set up in special delimited areas and freeing them therein from many distortions otherwise shackling the economy. This idea, which can be traced back to the free ports of the ancient city-states along the eastern and southern rim of the Mediterranean as well as to the Hansaleague, has received impetus in recent times from two main sources. First of all, the initial success which various fast-growing, newly industrialized countries (NICs) seemed to have had with economic activity zones soon produced numerous emulations as other countries sought ways to profit from freer trade without necessarily having to open up the entire economy. Second, and more recently, interest in such instruments has been spreading all the faster, the longer the current economic malaise lasts and the greater their potential is perceived as being capable of reactivating those market forces whose slipping into dormancy created a lethargic economy.

Despite these developments, the body of knowledge about the actual impact of economic activity zones (EAZs) is hardly commensurate with the importance with which the measure is viewed - as reflected in the increasing use of such economic activity zones particularly in LDCs. If misallocations of resources are to be kept to a minimum then an evaluation of experience made with existing EAZs may well help to structure EAZ policies in an efficient manner - this is the thrust of the following analysis. It begins with an overview of the economics of EAZs, trying to determine what they are supposed to achieve and how

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<sup>1</sup> The author expresses his appreciation to Mathias Bruch, Juergen B. Donges and Ulrich Hiemenz for worthwhile comments and suggestions on an earlier version of this paper. For any remaining inconsistencies the author would prefer to shift responsibility to them, but grudgingly applies the usual waiver. A word of true thanks is also due to the officials at the Penang Development Corporation, the Export Processing Zones Authority in Manila and the Export Processing Zones Authority in Taipei - without their cooperation the statistical basis for this paper would have been non-existent. Financial support was provided by the Stiftung Volkswagenwerk.

this is to be effected. The discussion is extended to determine whether investments in EAZs interface with or run counter to mainstream theory, not forgetting thereby the impact of the economic environment. In drawing on these issues it is concluded that under certain conditions EAZs can represent an efficient industrialization policy measure. To analyze this topic the role and impact of EAZs is reviewed for the ASEAN countries and Taiwan and analyzed for those where data is available. The paper closes with a summary and policy conclusions.

## II. On the Economics of Economic Activity Zones

Economic activity zones (EAZs) is a term which describes specially delineated areas of legal and/or geographic nature in which economic activities - freed from some or all regulations - take place (see Table A1 for a listing of various types of EAZs).<sup>1</sup> While in a purely legal form it applies to services like banking (free banking zone) or insurance (free insurance zone) where a physical (geographic) separation need not take place, the type of zone dealt with in this paper is both legally and geographically defined and harbors basically manufacturing industries producing for export markets, i.e. export processing zones (EPZs).

The establishment of EPZs in LDCs is intended to produce positive welfare effects analogous to those induced when a country moves towards free trade.<sup>2</sup> By subjecting activities in EAZs to

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<sup>1</sup> See Grubel (1982, 1983) for an overview and discussion of such facilities; for a brief overview of their use in Great Britain see Treasury (1980).

<sup>2</sup> In this paper the analysis concentrates on EPZs to mainly attract foreign direct investments. If local entrepreneurs are attracted it is assumed to be due to the fact that they would not have invested otherwise. Problems which might be encountered with companies shifting from a domestic location to an EAZ location only in order to rake in benefits are assumed not to take place.

no tariffs and but few other distortions (i.e. regulations) the factor intensity of production can be made to correspond more closely with the factor endowment of the host country. Comparative advantages in the LDC can thus be more efficiently exploited.<sup>1</sup> Given the posited relative abundance of labor in developing countries, the engendering of labor-intensive production methods can be assumed to represent an economically efficient development path.<sup>2</sup>

While the basic thrust of EPZs would seem to be straight forward and not differ significantly from other industrialization measures aimed at exploiting comparative advantages, the untidy and complicated real world makes it difficult to differentiate between various influences. At the center of the discussion is the question about the degree to which firms settling in EPZs will - in addition to generating labor income - be able to develop linkages to producers of intermediate and nonconventional inputs<sup>3</sup> in the domestic economy, helping thereby to expand the given industrial base. Beyond such static influences, but in the same vein, the question is also raised about the ability of EPZs to pass along knowledge, technology and know-how

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<sup>1</sup> A full-blown theoretical treatment on the impact of EPZs has yet to be produced, and in an early attempt by Hamada (1974) he even admits that his analysis might be "far too simple-minded". While Hamilton and Svensson (1982) have undertaken an extension and refinement of Hamada's results, their treatment as well is a less than adequate portrayal of the workings of EAZs; their 1983 article, however, does go a step further. Aside from a comment on Hamada by Rodriguez (1976) and some verbalization on theoretical aspects in Grubel (1982) there are not any other specific theoretical articles on EPZs.

<sup>2</sup> That is, of course, to the extent that we are dealing with Heckscher-Ohlin goods either as such or of the type at the end of the product cycle. Although it is not inconceivable that the production of certain types of Ricardo goods (i.e. raw material intensive) might take place in EAZs, this analysis does not deal with such possibilities.

<sup>3</sup> Nonconventional inputs are services in the widest sense.

to the domestic economy in form which can be combined with factor endowments to effect changes in the economic structures, i.e. engender dynamic shifts in line with changing comparative advantages. While it is the dynamic influences from which the most significant impulses are expected, only the static effects can be reasonably examined given the available data. However, wherever possible the dynamic implications will be taken into consideration.

As concerns the static aspects, it might well be assumed that - aside from possible influences from the physical delineation from the local economy and assuming that the firms in EPZs are indifferent vis-à-vis domestic or foreign suppliers - the establishing of linkages is basically dependent upon the level of development (in other words the production capacity) of the host country. The evidence on this aspect from earlier studies tends to show that while initially development levels do influence the degree to which linkages between EAZ firms and local producers develop, the parameters are not fixed.<sup>1</sup> For instance in a study on the behavior of foreign direct investment

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<sup>1</sup> An interesting analogy can be drawn between the scepticism with which the impact of firms in EAZs on the domestic economy is viewed and the impact of US direct investment in Europe in the 1950's and 1960's. The rapid expansion of the US MNCs was viewed with increasing scepticism because of the policies of these companies to rely to a large extent on imported capital equipment and intermediate inputs from the US. This behavior was usually justified by the subsidiaries as being due to established purchasing patterns as well as to the inability to procure comparable goods in Europe. In the meantime, however, most of these same American companies exhibit input structures which do not basically differ from their European counterparts. The reasons for this shift can be attributed to the fact that development differentials underlying the inability to find suppliers were overestimated and - to the extent that development differentials were not a causal factor - to the fact that the established purchasing patterns gave way to new and more convenient connections set up in Europe.

(FDI) in Taiwan (Schive, 1978) it was shown that a difference did exist between the input structure of domestic and foreign producers - holding the type of industry constant. Even greater was the difference between foreign producers located in EPZs and domestic producers located elsewhere. It was thus concluded that initiating backward linkages from establishments in the EPZs becomes doubtful (p. 155). However, in recent updates of this study (Schive and Majumdar, 1981 and Schive, 1981) doubt has given way to the viewpoint, that over time noticeable increases in the shares of inputs from domestic sources are revealed.

Other authors have established similar trends - Pang and Lim (1977) and Lim (1978), for instance, first concluded that in the electronics industry in Malaysia and Singapore linkages were at the most (in Singapore) miniscule. However, based on new evidence (for Singapore) they have now determined that over time (and regardless of nationality and product type) multinational corporations (MNCs) increasingly buy local inputs (1982). In a recent study of Malaysia (Spinanger, 1984) in which inter alia EPZs in Penang were examined, it could also be shown that over time linkages tended to develop.

In a broad-based study of Asian EPZs by ILO/ARTEP<sup>1</sup> various aspects concerning the spawning of linkages were touched upon, but no specific attempt was made to pry into the reasons behind the degree to which linkages developed - be they due to the economic environment in the host country or the parameters laid

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<sup>1</sup> ARTEP stands for the Asian Regional Team for Employment Promotion. The results of the studies so far have been published for Malaysia (Datta-Chaudhuri, 1982), the Philippines (Castro, 1982), Singapore (Chia, 1982), Sri Lanka (Ramanayake, 1982) and for the region (Edgren, 1982).



down by the parent MNC. In the former case it is not only the obvious physical separation which might well cause firms to avoid connecting up to the domestic economy, but also the host country through its own industrialization policies. As concerns the latter, no attempt has yet been made to determine whether those firms being set up in EPZs are actually of the type which will develop stronger ties with the host country. Perhaps many of those firms being set up in EPZs - now possible because of a globegirdling telecommunications network and perhaps induced by decreasing transportation costs as well as lower tariff barriers (see Loertscher and Wolter, 1980) - are so significantly different from other types of foreign direct investments that their development impact must be reexamined.<sup>1</sup> After all, the increased use of offshore processing and assembly regulations, where only the value added abroad is subjected to tariffs upon being reimported as a finished (or semifinished) product, has caused certain types of operations to be shifted to (mainly) LDCs (see Finger, 1975 and Germidis, 1980).

In one respect EPZs are different from other possible trade liberalization measures introduced to promote industrialization efforts in LDCs, as the alternatives (e.g. tariff rebates/exemptions/drawbacks) do not entail infrastructure expenditures. Thus even if the implications of both approaches were the same, the opportunity costs of constructing and financing EPZs with the necessary complementary infrastructure must be taken into consideration.<sup>2</sup>

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<sup>1</sup> For an overview of FDI evidence see Dunning (1982) and Agarwal (1980).

<sup>2</sup> In calculating the opportunity costs, the economies of scale achieved when developing large tracts of land, factories as well as utility and transportation infrastructure should not be forgotten. Particularly to the extent that environmental protection measures need be effected should economies of scale prove to be sizeable.

It must also be questioned, whether partial liberalization via an EPZ as opposed to other measures can actually be viewed as being roughly equivalent. It might well be the case that EPZs - *ceteris paribus* - are seen as offering something more, i.e. as representing a measure not only aimed at increasing exports via tariff reductions but also at reducing diseconomies associated with bureaucratic activities. For sure the costs engendered by bureaucracies should not be underestimated<sup>1</sup> and they are actually often the reason why investments in certain countries are not effected (see Wall, 1976). Thus, the assumption that EPZs attract at least some investments which otherwise might not have been forthcoming, had merely other measures been introduced, would seem to be legitimate.

Beyond these ramifications the impact of the firms locating in EPZs encompasses basically those stemming from the demand for financial resources, factors of production and nonconventional<sup>2</sup>/ intermediate inputs from the domestic economy and abroad. To the extent that the investments are effected from abroad the question arises as to whether mainstream theory of foreign direct investment is applicable.<sup>3</sup> While specific characteristics in this connection are not known, there are two obvious differences which could possibly influence investment behavior. First of all, EPZs are physically separated from the host economy. While this might well cause the hoped-for transfer of industrialization impulses to the domestic economy to be blocked or at least mitigated, it should not have an impact on the reasons for the direct investments, which are assumed to be to tap the relatively abundant fac-

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<sup>1</sup> Beyond the reduction of bureaucratic costs, perhaps even economies of scale can be realized and capitalized upon, thereby further increasing the benefits accruing to the economy.

<sup>2</sup> Nonconventional inputs are services in the widest sense.

<sup>3</sup> For a recent overview of such theories see Agarwal (1980).

tor of production in a relatively undistorted environment. Secondly, there is the stipulation that goods produced in EAZs in LDCs must be (almost) wholly exported or at least sold to other firms in the same EPZ. Although such limitations could keep horizontal-direct investments from being effected and promote vertical investments, this can hardly be considered to be a factor to cause given direct investment theories to be avoided.

More than likely what is being observed in the case of investments in EPZs in LDCs is the impact of a decrease in trade barriers (be they tariff, transportation or distance induced) causing thereby national boundaries to longer be considered as delimiting the area within which relocation of certain production processes can occur.<sup>1</sup> Hence the production of the various components of a given product tends to be shifted all the more to locations - *ceteris paribus* - where the combination of factors for each production process produces the lowest costs and hence the lowest completed product price. The rise in intraindustry trade among DCs can be considered as evidence of this development. Given the appropriate conditions - particularly with the global communications network which now exists - there would seem to be no reason why LDCs should not begin to be covered by such trends as well. That is, the production process is becoming internationalized in the true sense of the world.

Such a trend has no doubt received additional impetus by policies in DCs which have tended to make labor (e.g. via social policies) and capital (e.g. via environmental regulations and

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<sup>1</sup> For a corroboration of this see Loertscher and Wolter (1980).

tax policies) more expensive. To be sure, this would fit well into the pattern applied by Olson (1982) in explaining "the rise and decline of nations". Olson showed that economies over time have a tendency to develop rigor mortis due to - inter alia - regulations, bureaucracy and economic behavior aimed at preserving given structures.<sup>1</sup> He shows how much such a constellation leads to slower growth - seeking refuge in EPZs can hence be interpreted as one legal way of countering the rigor mortis process. Such "escaping" has actually been promoted in some cases by DCs<sup>2</sup> themselves by allowing the offshore assembly and/or processing of domestically produced components and subjecting their reimportation (e.g. in the form of finished products) to tariffs only on the value added abroad. Finger (1976) has shown that such arrangements - under certain assumptions - will prove to be a second best solution vis-à-vis free trade for LDCs. In light of the fact that the relocation of production processes or plants due to the above reasons is not limited to EPZs, it cannot necessarily be assumed that investments in EPZs will be basically different than those elsewhere.

Additional influences on firms in EPZs, leaving a large imprint on their behavior and functioning, stem from the manifold economic environment in the EPZs and domestic economy. First of all as Hamilton and Svensson have pointed out, given protection of firms in the domestic economy with relatively capital-intensive methods of production, domestic wage levels will be lower than in an undistorted situation.

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<sup>1</sup> That is to say, while on the one hand wage costs for the employer have been inflated by well-minded social legislation, on the other hand capital costs have been increased by environmental legislation measures as well as by a combination of high inflation rates and tax laws which only allow past rather than current replacement values to be depreciated.

<sup>2</sup> The United States and EEC countries have such arrangements; for a discussion thereof see Finger (1975).

Hence, firms locating in EPZs will be able to profit from distortions in the domestic zone.<sup>1</sup> Second, EPZs themselves are not necessarily free from distortions, as in a competitive world additional attraction in the form of tax holidays, accelerated depreciation allowances, etc. are offered.

Since such measures influence relative prices, factor intensities of production deviate from equilibrium levels. Furthermore, the larger the deviation in the capital-intensive direction, the greater the possibility that linkages in the form of intermediate inputs will not be able to be provided by the local economy. That is, the technology and skill levels exceed given factor endowments. Third, the actual location of the EPZs relative to labor supplies and nonconventional factors of production (i.e. whether located in an urban environment where agglomeration economies can be tapped or in rural environment - where they can't be) tend to shape - together with existing incentives - the factor intensity of production and the degree to as well as the speed with which linkages develop.<sup>2</sup> Fourth, while the availability of (potential) entrepreneurs in the domestic economy acts as an amplifier through which impulses (linkages) from the EPZs are sent, at the same time EPZs are supposed to help contribute to the growth of such essential ingredients for the industrialization process. It is true - as Schumpeter (1934, p. 63) pointed out - that development evolves mainly from factors within societies, then the development of the entrepreneurial spirit (or in the words

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<sup>1</sup> However, to consider this to be a subsidy of foreign firms in EAZs as Hamilton and Svensson do, is perhaps confusing causes and effects.

<sup>2</sup> While countries are usually referred to as having a specific homogeneous factor endowment, such simplifications can actually only be applied to point economies (e.g. Hong Kong or Singapore). Countries themselves usually have nonhomogeneous factor endowments with some areas densely populated and other areas sparsely populated. Even if all other factors were equal, the lack of agglomeration economies in certain areas would probably cause those firms contemplating locating in an EAZ in such areas, but not willing to adjust plant size to factor endowments (i.e. small scale establishments), to opt for incentives engendering capital-intensive production methods in order to avoid difficulties in securing the necessary labor inputs they need. Knowing that the MNCs adjust factor intensities only within certain ranges particularly with respect to establishment size - such an assumption seems quite reasonable.

of Leibenstein "the innovative entrepreneurs") via firms located in EPZs may prove to be a limiting factor if not already available.

Drawing on the above discussion it would seem to be possible to conclude that under certain conditions and in connection with other policy measures EPZs can represent an efficient industrialization policy measure. Two hypothesis - reflecting the above discourse - are put forth:

EPZs, although different from other industrialization measures because financial outlays are required, engender benefits for the host country via increases in the supply of foreign exchange, remuneration of factors of production and suppliers of intermediate/nonconventional inputs as well as via capitalization of economies of scale achieved in developing land, infrastructure and government services.

EPZs provide important impulses for the industrialization process of the host country in the form of linkages (through which demonstration effects, skills and technology are transferred) and - assuming they are relatively undistorted economic environments - ensure a relatively efficient allocation of resources.

Generally speaking, the first hypothesis can be stated as representing static effects while the second one embodies dynamic effects. As in the case of measuring the impact of a customs union, static effects can be relatively easily measured, but dynamic effects - from which the larger and more permanent industrialization impulses are expected - can basically only be hinted at.

### III. The Development of EPZs and Industrialization Policies in Selected Asian Countries

The roles that EPZs were assigned in the various countries<sup>1</sup> differ considerably, but generally speaking they can be classified into three groups according to the degree of openness of the economy (see Table 1 for an overview of the EPZs):

- In the case of Singapore<sup>2</sup> the EPZs (in the form of industrial estates (IEs) in an open economy) were but another part of a package designed to attract investment to a strategically located economy already (virtually) free of import/export regulations, with a high level of infrastructure as well as a stabile labor market and political conditions.
- In the case of Taiwan,<sup>3</sup> Malaysia<sup>4</sup> and to some extent Thailand, the EPZs were instituted as part of a shift in policies from an inward to an outward orientation and thus represent just one of the steps taken towards becoming more efficiently integrated into the world economy.

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<sup>1</sup> While all ASEAN countries and Taiwan are initially discussed here and then again in the concluding remarks, the actual empirical analysis only deals with those for which sufficient data is available. This means that in most cases Malaysia, the Philippines, Singapore and Taiwan are analyzed, but also that a subgroup of these four is dealt with. Likewise, in those few cases where data do not produce a complete picture other countries are referred to.

<sup>2</sup> To consider Singapore an economy-wide EPZ would probably not be incorrect, but it should be noted that a difference does exist: In Singapore both consumption and production activities take place, in an EPZ, however, only production exists. Nonetheless, Singapore assumes a position on the path towards a free, open market economy surpassed only by Hong Kong.

<sup>3</sup> In Taiwan the zones were aimed at labor intensive industries, particularly in connection with reducing the heavy dependence on agricultural exports.

<sup>4</sup> Malaysia's EPZs were initially set up to cater to the booming market for products and components from the electronics industry.

Table 1 - Basic Data on Export Processing Zones in Selected Asian Countries (around 1980)

|                                   | Date<br>established | Area              |                   |           | Premium<br>1000 US \$ /<br>acre | Rent<br>US\$/acre/year      | Lease terms<br>(years) |
|-----------------------------------|---------------------|-------------------|-------------------|-----------|---------------------------------|-----------------------------|------------------------|
|                                   |                     | planned           | developed         | allocated |                                 |                             |                        |
| <u>Indonesia</u>                  |                     |                   |                   |           |                                 |                             |                        |
| Batam Island <sup>a</sup>         | 1978                | 9143 <sup>b</sup> | 2224 <sup>c</sup> | ?         | 10.3                            | 629 <sup>d</sup>            | 30 (20)                |
| Jakarta/Tanjung Priok             | 1973                | 82 <sup>e</sup>   | 82                | ?         | -                               | 235224 <sup>f</sup> -470448 | 20 (20)                |
| <u>Malaysia</u>                   |                     |                   |                   |           |                                 |                             |                        |
| Johor/Fasir Gudang                | g                   | g                 | g                 | g         | 40 - 50                         | 92 - 184 <sup>h</sup>       | 60                     |
| Senai                             | 1977                | 100               | 90                | 67        | 27 - 40                         | 92 - 184 <sup>h</sup>       | 60                     |
| Melaka/Batu Berendam              | 1973                | 52                | 33                | 28        | 24                              | 80.8                        | 99                     |
| Tanjong Kling                     | 1973                | 170               | 170               | 71        | 17 - 20                         | 81 - 276                    | 99                     |
| Penang/Bayan Lepas                | 1971                | 304               | 263               | 160       | 40 - 50                         | 400                         | 60                     |
| Prai                              | 1972                | 416               | 303               | 212       | 33                              | 400                         | 60                     |
| Prai Wharf                        | 1972                | 42                | 38                | 15        | i                               | i                           | 60                     |
| Pulau Jerajak                     | 1972                | 406               | 20                | 20        | j                               | 400                         | 60                     |
| Selangor/Ampang - Ulu             | 1973                | 50                | 50                | 43        | 27                              | 810                         | 99                     |
| Klang                             | 1972                | 141               | 141               | 104       | 40                              | 1200                        | 99                     |
| Sungei Way - Subang               | 1972                | 141               | 141               | 104       | 40                              | 1200                        | 99                     |
| Telok Panglima Garang             | 1974                | 49                | 49                | 40        | 27                              | 810                         | 99                     |
| <u>Philippines</u>                |                     |                   |                   |           |                                 |                             |                        |
| Central Luzon/Bataan              | 1972                | 853               | 853               | 597       | -                               | 7982                        | 15                     |
| Central Visayas/Mactan            | 1979                | 294               | 294               | 45        | -                               | 9695                        | 15                     |
| Northern Luzon/Baguio             | 1979                | 156               | 156               | 18        | -                               | 12926                       | 15                     |
| <u>Singapore</u>                  |                     |                   |                   |           |                                 |                             |                        |
| All industrial areas <sup>k</sup> | 1960                | 21994             | 16554             | 6711      | -                               | 6804 - 35721                | 30 (30) <sup>l</sup>   |
| <u>Taiwan</u>                     |                     |                   |                   |           |                                 |                             |                        |
| Kaohsiung/Kachsiung               | 1966                | 168               | 168               | 168       | 10.4 <sup>m</sup>               | 10333                       | j                      |
| Nantze                            | 1970                | 222               | 222               | 165       | 37.6 <sup>m</sup>               | 7257 - 10333 <sup>n</sup>   | j                      |
| Taichung                          | 1971                | 57                | 57                | 57        | 38.3 <sup>m</sup>               | 4392 - 10333 <sup>n</sup>   | j                      |
| <u>Thailand</u>                   |                     |                   |                   |           |                                 |                             |                        |
| Lard Krahang                      | 1980                | 69                | 69                | 46        | -                               | 779                         | j                      |

<sup>a</sup> The entire island (160 sq. miles) is a free zone of which three areas are designated as industrial areas; Batu Ampar/Muka Kuning (1112 acres); Sekupang/Tanjung Uncang/Sagulung (914 acres); Nongsa/East Coast/Bukit Pancur (7117 acres).

<sup>b</sup> By 2004. - <sup>c</sup> By 1984. - <sup>d</sup> 6% of land value. - <sup>e</sup> Only about 5 acres for EPZ, the rest is for bonded warehouses. -

<sup>f</sup> Depends on whether buildings 10 ft. or 20 ft. high. - <sup>g</sup> Sites can be made available in 3 months. - <sup>h</sup> 92 for light industries, 138 for medium and 184 for heavy industries. - <sup>i</sup> Land sales frozen. - <sup>j</sup> Negotiable. - <sup>k</sup> In 1980 there were 19 industrial estates in operation and 15 under development or planned. - <sup>l</sup> Also 60 years leases possible in some areas. - <sup>m</sup> Payable in monthly installments over 10 years. - <sup>n</sup> Depends on whether in ready-made buildings or land for own factory.

Note: All figures refer to data around 1980 converted into US\$ with following exchange rates: Indonesia: 627; Malaysia: 2.18; Philippines: 7.51; Singapore: 2.14; Taiwan: 36; Thailand: 20.5.

Sources: Own calculations based on information from the respective agencies in the various countries.



- The Philippines and Indonesia represent countries where the EPZ's were erected to create at least some areas free of (most) distortions while the rest of the economy was still subjected to considerable distortions, a major policy shift not being underway.

Out of these six countries only four - Malaysia, the Philippines, Singapore and Taiwan - have EPZs which have been in existence long enough and which have data available for an analysis. In these four countries the EPZs have been established and equipped according to different concepts. As concerns their location,<sup>1</sup> in Taiwan and to a lesser degree in Malaysia the EPZs have been mainly set up near large cities and given infrastructure facilities<sup>2</sup> have either been drawn on or improved upon. In the Philippines, however, there has been a tendency to spread out the EPZs to try to cover regional policy aims and - particularly in the case of Bataan (where virtually nothing existed prior to the EPZ) - to create all the necessary infrastructure. Although basic services, i.e. developed land, utilities and ready-made factories, are provided in all EPZs, only in the case of Taiwan does one find that storage and transportation facilities as well as financial and advisory services are also offered.<sup>3</sup>

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<sup>1</sup> Since Singapore is almost a point economy, locational aspects are irrelevant.

<sup>2</sup> The interfacing of EPZs with transportation links to the rest of the world is given for EPZs in Singapore, Malaysia (Penang und Selangor) and Taiwan. For Bataan goods must be transshipped to Manila (100 miles by land, 30 by sea) and for Melaka transshipment by air is effected via Kuala Lumpur and by sea via Port Klang.

<sup>3</sup> Singapore, being a point economy and having all necessary nonconventional inputs does not really need to worry about such things. Nonetheless, an agency (the Economic Development Board) was set up to reduce information costs, i.e. to deal with any and all problems encountered by investors.

Overriding the immediate economic environment of the EPZs are the national incentive policies (see Table 2). These measures, instituted to make investments in a given country seem more rewarding, center around tax exemptions and depreciation allowances.<sup>1</sup> They can be summarized as follows:

- Malaysia, whose tax rates are otherwise the highest, has introduced the most extensive incentive package. It has attempted to structure the exemptions so that large amounts of capital are invested or more jobs per project are created. It offers a whole line of other incentives which are among the most generous of the four countries. Particular stress has been given to trying to promote an expansion of exports.
- The Philippines which offers a special incentive for firms in EPZs, offers no income tax exemption but rather stresses deductions from taxable income under a variety of conditions. The direct impact of the profits is difficult to discern.
- Singapore, offers the fewest incentives, but as concerns tax exemptions they are the longest. As in the case of Malaysia, particular stress is placed on export performance as a basis for receiving incentives. They have also been set up so as to promote a restructuring of the economy away from labor-intensive methods.
- Taiwan's incentive package also offers relatively few measures; but those it does offer stress more efficient and upgraded production methods. Its overall tax rate on promoted companies is the lowest of all four countries.

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<sup>1</sup> It might be noted that the regulations in the table apply both to domestic as well as foreign investors.

Table 2 - Overview of Important Taxes and Incentives in Selected Asian countries (around 1980)

|  | Malaysia  | Philippines   | Singapore   | Taiwan   |
|--|---|---|---|--|
| T A X E S  |   |   |   |  |
| Income/Profit taxes                                | Income: 40%<br>Excess profits: 5%<br>if > 91874 \$<br>Development: 5%   | Income: 25%<br>if ≤ 13309 \$<br>30%<br>if > 13309 \$  | Income: 40%   | Income: 15%<br>if 1389-2778\$<br>25%<br>if 2779-13889\$<br>35%<br>if > 13889\$   |
| Depreciation:                                      |   |   |   |  |
| Machinery equipment                                | 20% 1 <sup>st</sup> year + 8-12 years   | } straight-line<br>over<br>usable life  | 20% 1 <sup>st</sup> year + 6-10 years<br>or 3 years in some cases.  | 2-30 years   |
| Transport equipment                                | 16-20 years   |   | 20% 1 <sup>st</sup> year + 6 years<br>or 3 years in some cases  | 3-22 years   |
| Buildings/Plants                                   | 20% 1 <sup>st</sup> year + 8-50 years   |   | 25% + 3%/year or 3 years<br>in some cases   | 4-60 years   |
| Taxes on payments of:                              |   |   |   |  |
| Dividends  | 15%   | 15-35%  | 40%   | 35%  |
| Interest   | 10-15%  | 30%   | 40%   | 20%  |
| Royalties & fees                                   | 10-15%  | 30-35%  | 40%   | 30%  |
| I N C E N T I V E S                                |   |   |   |  |
| Income tax exemption based on:                     |   |   |   |  |
| Invested capital                                   | 2-5/8* years  | -   | -   | -  |
| Employment created                                 | 2-5/8* years  | -   | -   | -  |
| Approval only                                      | 3 years   | -   | 1-10 years  | 4-5 years<br>(afterwards: 25%)   |
| Investment tax credit ]<br>Investment allowances ] | 1-5 years;<br>10-100% of investment   | If domestic equip.;<br>the tariff on<br>imported substitutes<br>deductible;<br>25% of R + D<br>expenses, not<br>>10% of taxable<br>income.  | Can't exceed 50% of<br>fixed capital.   | For fuel effici-<br>ency, exports,<br>etc.<br>15% if domestic<br>equip., 10% if<br>for. equip.   |
| Accelerated depreciation                           | 2 years; 40%/year<br>for mach. + equip.;<br>30% for bldgs.<br>1 year; 80%.  | Twice as fast as normal   | -   | mach. + equip.<br>with: life ≥ 10<br>years = 5 years<br>life ≥ 10 years =<br>1/2 life; bldg.<br>etc. = 2/3 life;<br>new special mach.<br>+ equip. = 2/5 life       |
| Export incentives                                  | 1 <sup>st</sup> year: 12% of exports;<br>thereafter: 2% of exports<br>+ 10% of export increase;<br>overseas promotion ex-<br>penses; if 20% exported,<br>accelerated depreciation<br>(see above)*.<br>Drawback on duties.<br>Tariff exemption*. | Tariff exemption*<br>Tax credits on<br>taxes paid on inputs.<br>Deduction of dir. labor<br>costs + domestic raw<br>mat. ≤ 25% of exp. rev.<br>(5 years).<br>Certain national taxes<br>exempted. | Double deduction of<br>overseas promotion<br>expenses;<br>3-15 years tax exemption<br>if exports > 46703 \$<br>and ≥ 20% of sales<br>(90% of profit increase<br>exempt).  | Investment tax<br>credit (see above)<br>Import duties<br>paid back.<br>0.75% gross bus.<br>receipt waived.<br>Stamp tax reduced.<br>Tariff exemption,<br>deferred. |
| Additional incentives in<br>EPZs                   | -   | 3% contractor's<br>tax exempted.<br>50% of labor training<br>costs deductible, but<br>not >10% of wages<br>All municipal and pro-<br>vincial taxes exempted.                                    | -   | -  |
| Restrictions in EPZs                               | At least 80% must be<br>exported.   | -   | -   | 100% must be<br>exported.<br>Value added<br>≥ 25% of FOB<br>price.<br>Minimum invest-<br>ment: 150000\$.   |
| Other incentives                                   | Deduction for re-<br>investment 1-4 years;<br>25% of amount<br>Normal depreciation<br>and losses carried over<br>to post incentive<br>period.   | In certain locations*:<br>a) transportation cost<br>deduction<br>b) double deduction for<br>labor costs<br>c) infrastructive<br>investments =<br>tax payments.                                  | Training grants<br>560 - 4297 \$ per<br>trainee.<br><br>Interest grant for<br>investment if<br>a) less labor used or<br>b) greater produc-<br>tivity or<br>c) more sophisticated/<br>skilled operations.<br>Grant = 50% of i or<br>full amount at 7%.<br>Investment > 23351 \$.<br>Normal depreciation<br>and losses carried<br>over to post incen-<br>tive period. | Income tax only<br>22% if in new<br>science park.  |
| * Not available in EPZs.                           |   |   |   |  |

Source: Various publications from the respective countries and Deloitte, Haskins and Sells.

Given this background information on EPZs and industrialization policies in the selected countries, attention can be focussed on whether the above hypothesized impact of EPZs can be established.

#### IV. The Impact of EPZs

The analysis of the impact of EPZs begins with a treatment of the static effects basically covering the costs and benefits directly emanating from an EPZ or from the linkages between an EPZ and the host country/foreign sector. These are the most visible aspects of an EPZs presence in a given country and are those which have led some economists/international organizations to criticize EPZs as an industrialization policy measure<sup>1</sup>. Unfortunately data disaggregated to the level necessary is difficult to come by, hence a detailed investigation of these factors must be limited to Malaysia (i.e. the EPZs in Penang) and the Philippines (i.e. Bataan). These two examples should nonetheless allow more generalized conclusions to be drawn because they represent two widely differing approaches. In Malaysia the EPZs were established in an agglomerated area (Penang)<sup>2</sup>, which - up until after World War II - had been the richest area on the Malayan peninsula for centuries<sup>3</sup>, thriving on entrepot trade.

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<sup>1</sup> Symptomatic of such criticism is for instance UNIDO (1979, (p. 27): "There are .... a number of .... countries that have adhered to the exportation of manufactures from so-called free trade zones, which are usually not linked to the rest of the economy". Often it is the fact that mainly MNCs are located in EPZs, where they are perceived as exploiting cheap labor along sweatshop lines (see Fröbel et al. (1978), pp. 36-37.

<sup>2</sup> As was shown in Table 1 there were other EPZs in Malaysia (located in the state of Selangor, Melaka und Johore), but these were either hardly in use or the necessary data could not be obtained.

<sup>3</sup> Aside from Singapore since the mid 1800's.

It thus had most of the necessary infrastructure and offered a large reservoir of labor. In the Philippines<sup>1</sup> the Bataan EPZ was - as mentioned above - located in an area almost entirely underdeveloped and thus not only the necessary industrial infrastructure had to be established, but also labor had to be attracted to the area and housing provided.

To analyze the static impact of the EPZs in these two areas the development of employment, sales (exports), purchases (either imports or from host country) and remuneration of factors of production have been calculated. It is assumed that a positive balance vis-a-vis the domestic economy represents a net benefit to the economy, i.e. the investment in infrastructure has been compensated for by rent, wages and local purchases of capital/intermediate goods as well as services<sup>2</sup>. A positive foreign balance, where exports exceed imports plus the transfer of profits/interest payments, is also interpreted as a benefit to the economy. Obviously what cannot be determined is the extent to which other industrialization measures would have produced better (or worse) results. However, if (as pointed out in Section II) the existence of an EPZ is essential for investment to be made in a given country, then the problem is reduced considerably.

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<sup>1</sup> The other EPZs in the Philippines opened up just recently and hence could not be included.

<sup>2</sup> This analysis only includes direct effects, thus domestic multiplier effects from wages or local purchases are not accounted for; neither are leakages caused by induced imports incorporated. Shadow prices for wages have also not been deducted, mainly because of lack of information on the appropriate price, knowing that the structure of the employed is heavily weighted towards young females, many of whom have not been employed before. For those wanting to know what it might be with shadow prices for wages the following information: Shadow prices for wages equal to 10 per cent of average wage level would reduce net income generated in Penang by 6 per cent in 1973, 5 per cent in 1976 and 5 per cent in 1979. For the Philippines the values are -30 per cent in 1975, -110 per cent in 1978 and -30 per cent in 1981. For an analogous treatment of wages in Indonesia see Warr (1983).

In the case of Penang the following observations can be made (see Table 3):

- A sizeable and growing share of manufacturing employment in Penang is located in the EPZs. As a matter of fact almost 90 per cent of the increase in manufacturing employment in the period from 1973-1978 is accounted for by the EPZs. Given the booming worldwide market for products from the electronics industry (and most of the firms in Penang are in this branch) as well as the labor-intensity of the production processes relocated out of industrial countries, other industries would probably not have had produced similar results.
- Products produced in EPZs have been accounting for an ever increasing share of manufactured exports from Malaysia. If such exports are neglected the share of manufactured exports in total exports would have decreased. After an initial adjustment period the foreign balance (taking profit transfers and repayment of foreign loans into account) has exhibited a sizeable surplus.
- The degree to which linkages (i.e. intermediate inputs and capital goods) have been established to the domestic economy has increased over time (with some ups and downs). It is also worthwhile noting that production facilities in the EPZs producing inputs for other EPZ firms have been established. This can be interpreted as an indication of the EPZ becoming more than just an assembly location<sup>1</sup>.
- The net direct impact (i.e. income generated) of EPZs in Penang is positive and generally increasing over the period. Its share of wages and salaries in 1978 is somewhat higher than the share of EPZ employment in total employment. One important reason for this development

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<sup>1</sup> Information of qualitative nature and applying to the time after 1979 points to additional increases in the intermediate inputs from Malaysia as well as to the establishment of some facilities beyond mere production processes.

Table 3 : Development and Impact of EPZs in Penang (Malaysia) and Bataan (the Philippines)

|                                       | Penang |         |        |        |        |        |         |
|---------------------------------------|--------|---------|--------|--------|--------|--------|---------|
|                                       | 1973   | 1974    | 1975   | 1976   | 1977   | 1978   | 1979    |
| Employment <sup>a</sup>               | 14.02  | 17.41   | 21.01  | 25.98  | 28.11  | 30.55  | 35.83   |
| % of emp. in Penang <sup>b</sup>      | 27.8   | -       | -      | -      | -      | 44.2   | -       |
| Sales of EPZ firms <sup>c</sup>       | 52.16  | 70.98   | 130.66 | 282.46 | 258.83 | 624.29 | 1201.48 |
| % intra-EPZ                           | 0.67   | 2.89    | 5.55   | 8.02   | 10.38  | 7.32   | 30.96   |
| % of exports <sup>d</sup>             | 14.95  | 12.59   | 18.57  | 32.54  | 25.41  | 42.05  | 42.47   |
| Purchases of EPZ firms <sup>c,e</sup> | 55.27  | 131.06  | 125.54 | 231.95 | 191.16 | 377.76 | 441.79  |
| % from Malaysia                       | 0.74   | 2.16    | 5.70   | 2.92   | 5.60   | 3.51   | 3.13    |
| Capital goods <sup>c</sup>            | 15.28  | 74.06   | 56.81  | 11.88  | 18.97  | 14.66  | 75.65   |
| % from Malaysia                       | 12.01  | 26.20   | 47.93  | 19.85  | 27.22  | 18.31  | 28.73   |
| Net income generated <sup>c,f</sup>   | 10.37  | 42.11   | 59.40  | 39.98  | 50.64  | 69.97  | 111.14  |
| Foreign balance <sup>c,g</sup>        | -17.33 | -114.46 | -35.38 | 5.59   | 16.26  | 154.59 | 229.75  |
|                                       | Bataan |         |        |        |        |        |         |
|                                       | 1975   | 1976    | 1977   | 1978   | 1979   | 1980   | 1981    |
| Employment <sup>a</sup>               | 5.97   | 11.13   | 14.53  | 18.32  | 19.32  | 20.95  | 19.95   |
| % of emp. in C. Luzon <sup>h</sup>    | 10.5   | -       | 25.0   | -      | 32.4   | -      | -       |
| Sales of EPZ firms <sup>c</sup>       | 33.99  | 25.53   | 43.62  | 74.58  | 109.09 | 136.67 | 154.46  |
| % of exports <sup>d</sup>             | 5.40   | 6.43    | 6.74   | 10.55  | 11.01  | 11.60  | 12.00   |
| Purchases of EPZ firms <sup>c</sup>   | 19.98  | 21.30   | 24.56  | 51.72  | 68.79  | 85.13  | 98.21   |
| Capital goods <sup>c</sup>            | 42.47  | 4.77    | 10.37  | 5.17   | 4.85   | 6.71   | 9.64    |
| Net income generated <sup>c,i</sup>   | -2.72  | -1.83   | -0.65  | 1.12   | 5.09   | 5.24   | 4.91    |
| Foreign balance <sup>c</sup>          | -53.80 | -8.13   | -1.90  | 5.85   | 21.79  | 31.59  | 31.62   |

<sup>a</sup>1000s. - <sup>b</sup>Manufacturing sector, based on census of manufactures. - <sup>c</sup>Millions of U.S.\$, converted using current exchange rates. - <sup>d</sup>% of manufactured exports. - <sup>e</sup>Purchases of raw materials, parts and components. - <sup>f</sup>Includes wages and salaries, purchases of intermediate inputs and capital goods in Malaysia, rent, and services. - <sup>g</sup>Includes foreign purchases and sales of intermediate inputs and capital goods as well as interest payments and profit transfers abroad. - <sup>h</sup>Manufacturing sector, based on census of manufactures. - <sup>i</sup>As in e, but also includes profit taxes.

Source: Own calculations based on various national statistics.

is the fact that expenditures for the industrial infrastructure (hence capital costs) were quite nominal.

In the case of Bataan the following observations can be made:

- While employment in the EPZs initially increased rapidly, it has stagnated in recent years. Although its share in manufacturing employment in the province is quite large, a large percentage of the workers has migrated from other areas (Castro, 1982).
- The EPZ share of manufactured exports has remained quite steady over the last four years. The foreign balance has turned positive but has stagnated and is relatively small.
- Linkages with the economy have hardly developed, with the exception of services and some raw materials. Statistics on these are, however, very rough and therefore they are not included in the table.
- The net direct impact is - summed over the entire period - just slightly positive. For sure if the capital costs were included for the infrastructure necessary for Bataan to be linked to Manila, then the net impact would be negative.

To summarize: the above observations underline quite well the impact of two different approaches taken in setting up EPZs. Whereas Penang was able to profit from existing infrastructure facilities and engendered an atmosphere in which companies expanded and new ones were set up, Bataan



suffered from the location, which probably kept it from attracting more companies and hindered others from expanding<sup>1</sup>. The extent to which the locational disadvantages also kept linkages from being set up cannot be determined. However, it is more likely the entire economic environment which acts as a brake here<sup>2</sup>.

It might be worthwhile to focus a little more on the linkages as it is this aspect which is supposed to transmit benefits to the local economy in the form of contacts, technology and demonstration effects. While the evidence for Malaysia (as concerns the local inputs) is not overly convincing, it is possible to draw on available information from Singapore and Taiwan as well as South Korea to show that - given the conditions in these countries - linkages do develop over time as (inter alia) development levels increase. Diagram 1 attempts to underline this point by plotting the share of inputs coming from the local economy

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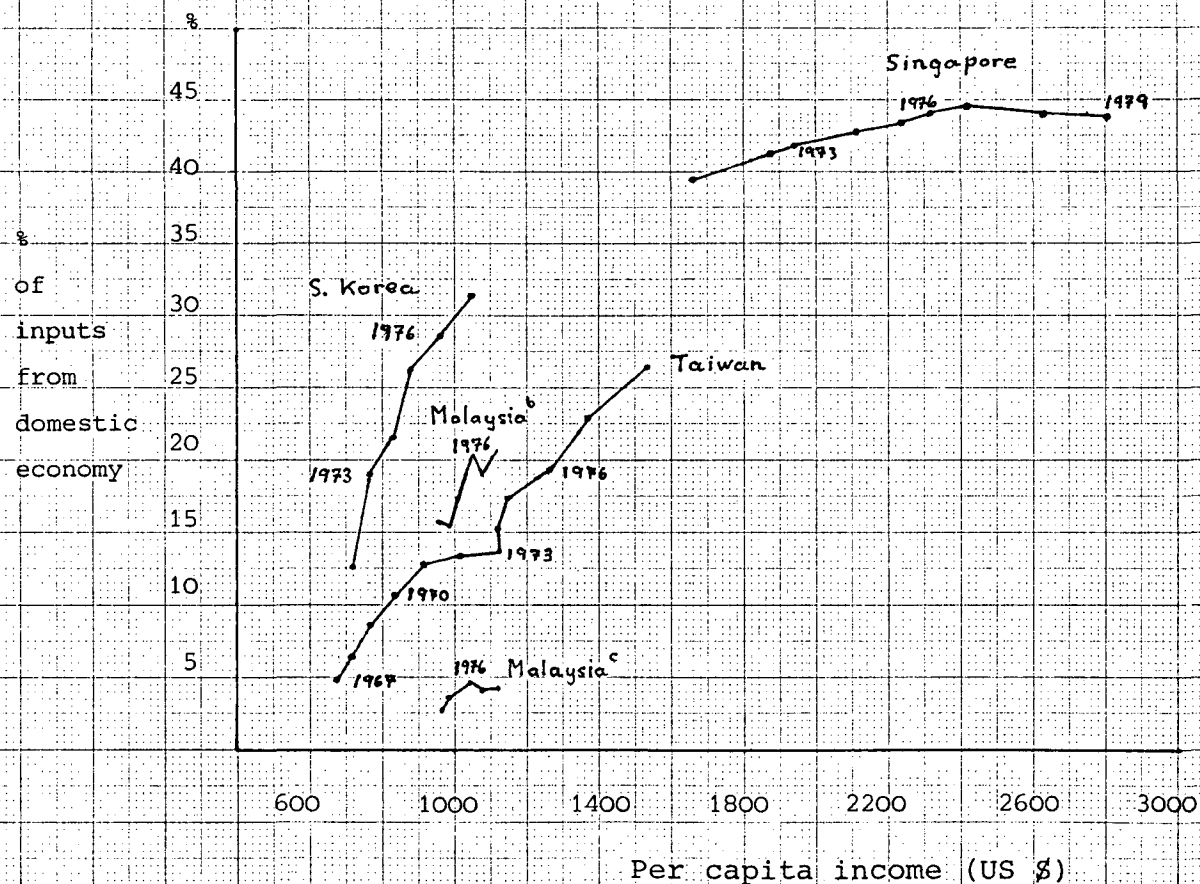
1

In most recent times labor unrest has no doubt added to the difficulties.

2

It might be added that the majority of jobs in both of the EPZs are held by young, unmarried women (see Datta-Chaudhuri, pp. 20-22 and Castro, p. 28). However, to infer - as is often done - that this is something which must enter into the EPZ analysis with a negative sign, since they are being "exploited" in such jobs, would at least be hasty, if not incorrect. Aside from usually being paid better than in other (low-skilled) jobs, the role that such jobs play in helping to bridge the gap between traditional and modern sectors should not be overlooked. Stating that women are out of place in such jobs is another argument brought forth. Such arguments - aside from transgressing the scope of this paper - must be dealt with by society itself. For a brief rational treatment of the entire complex see Lim (1980).

Diagram 1 : Development of Linkages<sup>a</sup> between EPZs and Domestic Economies  
in Selected Asian Countries



<sup>a</sup> Moving 3-year average of shares.

<sup>b</sup> Shares of capital goods (excluding construction).

<sup>c</sup> Shares of other inputs.

Source: Own calculations based on data provided from EPZ agencies.

against GNP/capita<sup>1</sup>. Admittedly this is an oversimplification, but it shows quite well how developed the linkages are<sup>2</sup>.

It is a simplification to use development levels as a proxy for linkage potential, since the economic environment itself - by setting parameters - basically influences the degree to which linkages develop and strengthen. This brings us to the second complex to be investigated, namely the more dynamic aspects of EPZs, which begin with the efficient allocation of the factors of production in the EPZ and end with the impact of the EPZ on the industrialization process. To investigate the former aspect the EPZs have been analyzed vis-a-vis their structure as well as the factor intensity of production taking place therein. It is expected that the impact of the economic environment will be reflected in these indicators and it is assumed that the comparative advantage lies in the use of the relatively more abundant factor of production - labor. Thereby, the level of development (expressed as income/capita) is assumed as being

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<sup>1</sup> While the detailed data necessary to produce these calculations for Penang and Bataan were not available for Taiwan, all indicators point to a highly successful performance of the EPZs in Taiwan. That linkages have been established is not only evidenced by an increasing share of domestic inputs, but also by the growth of local companies producing products competing well with those manufactures in the EPZs. To support this trend a new type of EPZ - a science park - has been set up southwest of Taipei to facilitate the spawning of new technologies and their eventual incorporation into competitive products (see Far Eastern Economic Review, June 25, 1982). Already 30 firms have set up operations and 12 more are being established (see Asian Finance, September 15, 1983, pp. 87-89).

<sup>2</sup> One obvious weakness is that the degree to which inputs are drawn from companies who themselves import inputs the domestic content is reduced. Data on this aspect are not available to the author, but in conversations with officials in various countries the companies with which linkages were established were not considered as having an overly propensity to import.

Table 4: The Structure of the Domestic Economies and EPZs in Selected Asian Economies

| Industry <sup>b</sup> | Domestic economy <sup>a</sup> |                   |                   |                   |         |                   | EPZ 1978   |                   |         |          |
|-----------------------|-------------------------------|-------------------|-------------------|-------------------|---------|-------------------|------------|-------------------|---------|----------|
|                       | Employment                    |                   | Value added       |                   | Exports |                   | Emp. share | Value added share | Exports |          |
|                       | 1973 <sup>c</sup>             | 1978 <sup>d</sup> | 1973 <sup>c</sup> | 1978 <sup>d</sup> | 1973    | 1978 <sup>e</sup> |            |                   | share   | % of (6) |
|                       | (1)                           | (2)               | (3)               | (4)               | (5)     | (6)               | (7)        | (8)               | (9)     | (10)     |
| Malaysia              |                               |                   |                   |                   |         |                   |            |                   |         |          |
| 321                   | 7.92                          | 8.98              | 4.76              | 6.52              | 1.47    | 1.94              | 24.31      | 37.04             | 26.41   | 83.81    |
| 322                   | 3.77                          | 3.93              | 1.36              | 1.42              | 0.72    | 1.02              | 5.63       | 0.92              | 1.60    |          |
| 323                   | 0.30                          | 0.22              | 0.14              | 0.99              | 0.02    | 0.03              | -          | -                 | -       | -        |
| 382                   | 5.03                          | 3.42              | 3.99              | 3.29              | 1.37    | 1.16              | -          | -                 | -       | -        |
| 383                   | 8.91                          | 14.51             | 8.61              | 10.31             | 0.66    | 6.97              | 48.74      | 55.46             | 68.16   | 48.27    |
| 385                   | 0.60                          | 3.17              | 0.45              | 5.32              | 2.54    | 2.87              | -          | -                 | -       | -        |
| 390                   | 0.66                          | 2.09              | 0.35              | 1.18              | 0.30    | 0.50              | -          | -                 | -       | -        |
| Σ                     | 27.20                         | 36.31             | 19.66             | 28.13             | 7.09    | 14.48             | 78.68      | 93.42             | 96.16   | 55.07    |
| Philippines           |                               |                   |                   |                   |         |                   |            |                   |         |          |
| 321                   | 14.30                         | 12.86             | 7.95              | 5.93              | 6.41    | 4.70              | 4.86       | 3.21              | 1.43    | 1.12     |
| 322                   | 4.34                          | 15.72             | 1.08              | 4.57              | 0.94    | 5.14              | 48.55      | 28.43             | 34.75   | 24.93    |
| 323                   | 0.28                          | 0.39              | 0.13              | 0.14              | 0.32    | 0.33              | 3.41       | 4.41              | 1.95    | 21.79    |
| 382                   | 2.39                          | 2.20              | 1.73              | 1.58              | 0.40    | 0.89              | 0.44       | 0.29              | 0.72    | 2.97     |
| 383                   | 3.16                          | 4.48              | 3.22              | 4.86              | 0.13    | 1.27              | 3.89       | 3.15              | 13.23   | 38.37    |
| 385                   | 0.16                          | 0.17              | 0.09              | 0.22              | 0.29    | 1.75              | 2.19       | 0.84              | 5.47    | 11.54    |
| 390                   | 0.95                          | 1.05              | 0.37              | 0.28              | 1.49    | 3.29              | 12.35      | 6.85              | 6.29    | 7.05     |
| Σ                     | 25.58                         | 36.86             | 14.53             | 17.59             | 9.96    | 17.36             | 75.70      | 47.18             | 63.84   | 13.55    |
| Singapore             |                               |                   |                   |                   |         |                   |            |                   |         |          |
| 321                   | 7.28                          | 4.11              | 5.75              | 2.70              | 5.40    | 3.86              | -          | -                 | -       | -        |
| 322                   | 10.80                         | 12.15             | 3.89              | 4.83              | 2.64    | 2.21              | -          | -                 | -       | -        |
| 323                   | 0.37                          | 0.57              | 0.24              | 0.31              | 0.12    | 0.10              | -          | -                 | -       | -        |
| 382                   | 4.03                          | 7.94              | 3.92              | 9.27              | 8.81    | 6.82              | -          | -                 | -       | -        |
| 383                   | 22.95                         | 24.93             | 23.13             | 23.23             | 9.16    | 13.41             | -          | -                 | -       | -        |
| 385                   | 3.36                          | 3.41              | 2.28              | 2.88              | 4.01    | 4.99              | -          | -                 | -       | -        |
| 390                   | 2.85                          | 2.11              | 1.47              | 1.60              | 1.39    | 1.56              | -          | -                 | -       | -        |
| Σ                     | 51.63                         | 55.21             | 40.70             | 44.83             | 31.53   | 32.56             | -          | -                 | -       | -        |
| Taiwan                |                               |                   |                   |                   |         |                   |            |                   |         |          |
| 321                   | 19.00                         | 18.48             | 13.65             | 15.08             | 17.00   | 10.76             | 3.57       | -                 | 1.75    | 1.56     |
| 322                   | 0.56                          | 5.03              | 0.29              | 2.79              | 10.85   | 4.22              | 12.34      | -                 | 9.86    | 22.47    |
| 323                   | 6.61                          | 1.13              | 4.08              | 0.68              | 0.84    | 1.78              | 3.18       | -                 | 3.21    | 17.34    |
| 382                   | 5.72                          | 4.80              | 4.75              | 3.88              | 4.83    | 7.67              | 1.26       | -                 | 0.73    | 0.91     |
| 383                   | 11.03                         | 13.22             | 15.33             | 13.87             | 16.04   | 13.10             | 55.59      | -                 | 63.24   | 46.40    |
| 385                   | 0.40                          | 1.07              | 0.28              | 0.75              | 2.14    | 3.20              | 4.84       | -                 | 6.22    | 18.67    |
| 390                   | 4.58                          | 4.67              | 3.57              | 2.46              | 6.05    | 11.82             | 4.92       | -                 | 3.56    | 2.89     |
| Σ                     | 47.44                         | 48.38             | 41.94             | 39.50             | 57.74   | 52.56             | 87.70      | -                 | 88.15   | 16.12    |

<sup>a</sup>Share of particular industry in respective manufacturing total (excludes 353, 354, 371 and 372). - <sup>b</sup>See Appendix for listing of industry names. - <sup>c</sup>For the Philippines the data is for 1972; for Taiwan it is 1971. - <sup>d</sup>For Taiwan it is 1976. - <sup>e</sup>For Malaysia it is 1977.

Source: Own calculations based on various national statistics.

negatively correlated with the labor intensity of production. Since most resource-intensive products (Ricardo goods) have been eliminated from the analysis, it is not necessary to worry about possible influences of such production methods on the structure or factor intensity of production.

The information in Table 4 provides an overview of the structure of the domestic economies and the EPZs in the four countries for which data were available. It becomes evident that there is a relatively heavy representation of the MFA<sup>1</sup> industries (321 and 322) and the electronics industries (383 and 385) in the EPZs (columns 7-9) as opposed to their shares in the domestic economy as a whole (columns 1-6). Most specialized are the EPZs in Malaysia (i.e. Penang) where (depending on the indicators used) up to 96% of the activities are concentrated in these industries. It can also be seen that in the case of Malaysia and the Philippines the domestic economy is shifting towards a stronger concentration in the industries listed. This is particularly true for those two countries in the case of exports - they (roughly) doubled. As concerns Singapore and Taiwan the share of these industries has remained relatively constant with shifts taking place within the seven industries. These trends reflect of course normal structural shifts evolving in developing and growing economies. In the case of the former the structural shifts take the shape of movement into production of non-traditional manufactures. In the latter case the processes evolve through an upgrading of production facilities and a shift into industries with more physical and human capital intensive lines. In both cases the impulses stemming from the EPZs cannot be overlooked (Table 4, col. 10).

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<sup>1</sup> MFA is used to describe the industries covered by the Multifiber Agreement - 321: textiles and 322: clothing.

Moving beyond the development of the structure of the economy into the factor intensity of production methods, conventional mainstream economic wisdom tells us that the comparative advantages of the countries are being exploited in an economically efficient manner if the factor intensity of production processes corresponds to the factor endowment of the country. Assuming that per capital income levels roughly capture differences in relative factor endowments, then one could expect to find (keeping in mind the usual assumptions) that factor intensities of production would roughly correspond to this ranking. In the same vein the existence of an EPZ should not impact factor intensities in a manner contrary to assumed levels for the country as a whole. Obviously, however, to the extent that such facilities are located in high income areas in a given country, then the factor intensities will deviate from the country average.

An examination of the data reveals that the most capital intensive production facilities are not located in an EPZ in the highest income country (Table 5). As a matter of fact in five cases either Malaysia or the Philippines tend to be the most or second most capital intensive. That this is not merely a problem of having an incorrect exchange rate, can be seen if the capital intensities for the economies as a whole are referred to. Here the order more or less coincides with the per capita income rankings. What we are thus observing in the case of Malaysia and the Philippines is no doubt to a large extent the impact of the policy package on the factor intensity of production in the EPZs. For Malaysia the incentives offered (see Table 2) can be construed as having shifted production methods in the capital intensive direction (see Spinanger, 1984). For the Philippines the fact that capital depletion allowances prevailed and agglomeration economies could not be exploited in Bataan (that is, there are none in Bataan) caused the firms to lean to capital intensive methods.

Table 6: Per Capita Income Capital Intensity and Productivity  
in EPZs in Selected Asian Countries

| Industry <sup>a</sup> | EPZ indicators <sup>b</sup>           |                  |                |        | Economy  |                               |                     |
|-----------------------|---------------------------------------|------------------|----------------|--------|----------|-------------------------------|---------------------|
|                       | Malaysia                              | Philip-<br>pines | Singa-<br>pore | Taiwan | Malaysia | Philip-<br>pines <sup>c</sup> | Taiwan <sup>d</sup> |
|                       | Per capita income (US\$)              |                  |                |        |          |                               |                     |
|                       | 1090                                  | 510              | 3290           | 1400   | -        | -                             | -                   |
|                       | Capital intensity (US\$) <sup>e</sup> |                  |                |        |          |                               |                     |
| 321                   | 23842                                 | 20973            | 8642           | 1575   | 7145     | 3722                          | 8429                |
| 322                   | 2334                                  | 1244             | 1424           | 977    | 1323     | 461                           | 1498                |
| 323                   | -                                     | 7915             | 1976           | 2371   | 2163     | 861                           | 1418                |
| 382                   | -                                     | 4593             | 7765           | 10393  | 3334     | 1678                          | 4035                |
| 383                   | -                                     | 12582            | 3006           | 2382   | 2819     | 1648                          | 3442                |
| 385                   | 5921                                  | 2438             | 5804           | 5532   | 2513     | 1875                          | 2678                |
| 390                   | -                                     | 1455             | 3336           | 2197   | 2452     | 922                           | 1810                |
| Σ                     | 11200                                 | 3484             | 3937           | 2431   | 3723     | 1839                          | 4942                |
| Total<br>industry     | 10031                                 | 3709             | 9431           | 2511   | 5595     | 3417                          | 7463                |
|                       | Productivity <sup>f</sup>             |                  |                |        |          |                               |                     |
| 321                   | 21367                                 | 1199             | 8597           | 7377   | 2180     | 441                           | -                   |
| 322                   | 5572                                  | 2915             | 6990           | 12005  | 2627     | 400                           | -                   |
| 323                   | -                                     | 2325             | 7941           | 15154  | 1286     | 832                           | -                   |
| 382                   | -                                     | 6593             | 12458          | 8717   | 3437     | 275                           | -                   |
| 383                   | -                                     | 13843            | 19312          | 17095  | 4856     | 232                           | -                   |
| 385                   | 27502                                 | 10142            | 10570          | 19308  | 9153     | 8367                          | -                   |
| 390                   | -                                     | 2074             | 8541           | 10873  | 2423     | 3076                          | -                   |
| Σ                     | 24037                                 | 3434             | 13750          | 15458  | 4033     | 512                           | -                   |
| Total<br>industry     | 19227                                 | 4071             | 22793          | 15028  | 9850     | 1253                          | -                   |

<sup>a</sup>For listing of industries see appendix. - <sup>b</sup>1978. - <sup>c</sup>1977. - <sup>d</sup>1976. -  
<sup>e</sup>Fixed assets/employee. - <sup>f</sup>Exports/employee.

Source: Own calculations based on various national statistics.

That EPZs do not inherently induce more capital intensive methods than in the domestic industry can be seen in the case of Taiwan. And it was also in Taiwan where the incentives or general fiscal measures tended to be more neutral vis-à-vis a particular factor of production.

Given this constellation a final point would seem worthwhile examining namely the (labor) productivity of firms operating in the EPZs<sup>1</sup> in order to determine to what extent the more capital intensive methods of production allowed higher productivity levels (see Table 5). This can generally be seen to hold true for Malaysia, but not for the Philippines. Otherwise most productive were those industries in either Taiwan or Singapore. The average for those industries listed underlines this finding. In other words Malaysia's capital intensive investments were at least rewarded by high productivity. The Philippines on the other hand exhibit productivity levels which hardly correspond with the capital intensity for the listed industries. That is, in the Philippines the impact of a misallocation of production seems to have been exacerbated by an inefficient use of the capital equipment. The negative impact on the foreign balance - via imported capital equipment - became obvious in the initial calculations on the costs and benefits of the EPZs. To conclude, however, that this can be attributed to the behavior of foreign corporations investing in Bataan to milk profits out of the Philippines would not be correct as it can be shown that 100% foreign owned corporations are four times more productive than those 100% domestically owned, and not necessarily more capital intensive.

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<sup>1</sup> For lack of other statistics and to allow comparisons between countries productivity was calculated by dividing exports by number of employees. Since almost all products manufactured in the EPZs are exported and assuming that the input shares do not differ widely, then these figures are roughly comparable.



## V. Summary and Conclusions

The EPZs established in the Asian countries examined in this article have shown that to be successful as an efficient instrument in the industrialization process they must be embedded in an appropriate policy framework. The evidence from Singapore and Taiwan, where basically such policies prevailed and where strong linkages with the domestic economies have developed underlines this. Whereas in Taiwan the EPZs have even helped spawn a domestic electronics industry which produces competitive facsimiles of brand-name home computers, in Singapore the externalities produced by the electronics industry are seen as representing a new comparative advantage to be exploited. While in the case of Malaysia the linkages are weaker, they have been developing and there are indications that more than just processing work is being carried out in the EPZs. The Philippines EPZ in Bataan, however, proved to be less successful in harnessing the potential of this industrialization tool, be it due to the policy of trying to fit the EPZ in other goals (i.e. regional development) or the immediate economic environment. As concerns the location of EPZs this factor would seem to be not only of importance for the development of linkages, but also for the macro-economic profitability of the venture itself. Thus Bataan - by being located in a backwater region (albeit to develop it) - had to provide all the facilities that the other EPZs could easily draw from immediate agglomerated areas. Likewise the location of Bataan - as well as the incentives offered - can also be considered to be factors contributing to a factor intensity of production not in line with the factor endowment of the Philippines. The incentive package in Malaysia also slanted the factor intensity

of production towards capital intensive methods not necessarily in line with its comparative advantages. For Singapore and Taiwan the incentive package proved to be less distorting.

To summarize:

- EPZs of the type being set up to exploit the abundant factor labour in LDCs, catering thereby mainly to multinational corporations (MNCs), seem to place demands on their environment which can be best met in urban areas, where agglomeration economies can be tapped and complementary infrastructure facilities are readily available.<sup>1</sup>
- EPZs seem to fulfill their purpose (i.e. providing stimulus to the industrialization process via linkages, technology transfers and demonstration effects) best, in those cases where the entrepreneurial spirit does not have to be kindled and social attitudes don't stand in the way of modern production processes.
- EPZs in an otherwise inward-oriented economy are neither a panacea nor a sufficient measure to carry the burden of more efficiently integrating the economy into the international division of labour.

Given these results the conclusions for future EPZs are virtually self-evident. But obviously - as numerous studies on investment decisions in the past have shown - offering EPZs in the right location, with the right incentives and in the right economic environment will not bear fruits if other, overriding factors (such as political stability) are

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<sup>1</sup> For an examination of the EPZs in Malaysia see Spinanger (1984).

not taken into account. Bearing witness to this fact is the economic success of Singapore and Hong Kong - a economic success which (if it continues) will have them overtaking their mother country<sup>1</sup> in terms of per capita income within a decade. The success of these two city-state EPZs and Taiwan as well - particularly as concerns the upgrading of products - shows that pessimistic analyses about "a lack of space" for other developing countries to repeat such successes are out of place.<sup>2</sup> Singapore, for instance, is even purposely trying to rid itself of labor-intensive industries and Taiwan (as mentioned above) is promoting human-capital intensive research and production. Thus those developing countries (where the conditions for EPZs are met) willing to carve out a piece of their economy, free this area from distortions and allow new industries to be established and produce in line with the given factor endowment, would seem to have a chance to quicken their industrialization process.

Before closing a caveat seems necessary as EPZs may well be used by politicians (in countries with otherwise high protection rates) as their "alibi" trade liberalization policy. Thus instead of inducing competitive industries, the existing tariff barriers are left intact - or even increased though other measures - and industries are established, the competitiveness of which in world markets would probably not be given. Under such conditions EPZs - even if benefits in terms described above are engendered - the long-term losses through continued misallocation of resources would no doubt override them.

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<sup>1</sup> Former mother country for Singapore.

<sup>2</sup> See for instance Cline, 1982.

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A p p e n d i x

Table A1 - A General Taxonomy of Economic Activity Zones

| Type of Zone (Z)  | Usual Features                            | Applied to   | Examples of   |
|---|---|--|---|
| Free Banking/Insurance Z.                                 | Freed from most/all regulations           | Services for foreign/domestic markets                            | Eurodollar market, Lloyds of London, NY Free Ins. Zone          |
| Export processing Z.<br>Free trade Z.<br>Foreign trade Z. | No tariffs, tax exemptions, less red tape | Mainly manufacturing activities for export                       | Shannon (Ireland)<br>Bataan (Philippines)<br>Kaohsiung (Taiwan) |
| Free port   | No tariffs, no taxes, less red tape       | Basically storage and transshipping facilities                   | Hamburg (Germany)<br>Penang <sup>1</sup> (Malaysia)             |
| Bonded warehouse  | No tariffs, no taxes, less red tape       | Storage of goods   | USA, Malaysia, Indonesia  |
| Duty free shops   | No tariffs, no taxes, less red tape       | Sale of goods to be exported or consumed by foreigners/travelers | Airport boats, planes, special stores                           |
| Enterprise Z.   | Reduced taxes and less red tape           | Most types of economic activities                                | Great Britain   |
| Industrial estate<br>Industrial park                      | No specific                               | Most types of economic activities                                | Great Britain, USA, Taiwan, Malaysia                            |
| Science park  | No specific, often near universities      | High technology industries, research facilities                  | USA, Singapore, Taiwan  |

<sup>1</sup> Up to mid 70's.

Table A2: Listing of Industries

| Major group | Products manufactured   |
|-------------|---|
| 321         | Textiles  |
| 322         | Wearing apparel, except footwear  |
| 323         | Leather and leather products, leather substitutes and furs, except footwear and wearing apparel |
| 382         | Machinery and equipment except electrical   |
| 383         | Electrical machinery, apparatus, appliances and supplies  |
| 385         | Professional and scientific, measuring and control equipment, photographic and optical goods    |
| 390         | Other manufactured goods (e.g. handicrafts).  |

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