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**EXPORT PROCESSING ZONES
IN CENTRAL AMERICA**

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Abstract

This paper analyzes the Export Processing Zones (EPZ's) from a worldwide perspective and attempts to draw useful lessons from the accumulated experience in several countries. It then examines the development and economic significance of the EPZs and similar export-oriented regimes in Central America. The paper ends with a set of conclusions and policy proposals for EPZ development in the region.

Resumen

Este trabajo analiza las Zonas Procesadoras de Exportaciones (EPZs) desde una perspectiva mundial y trata de derivar lecciones útiles a partir de la experiencia acumulada de varios países. La segunda parte del trabajo examina el desarrollo y la significancia económica de las EPZs y de otros regímenes similares orientados hacia la exportación. El trabajo termina con una serie de conclusiones y de recomendaciones de política que promuevan el desarrollo de las EPZs en la region.*

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1. Introduction

With the hope of following the path of the Newly Industrialized Countries of East Asia (Hong Kong, Singapore, Taiwan, and Korea), many developing countries have moved from a strategy of development based on import substitution to one based on export promotion.¹ As part of their policy instruments to promote exports, many of these countries have established export processing zones (EPZs). These zones have been seen as a quick and efficient way of generating employment, earning much needed foreign exchange, attracting foreign direct investment (FDI) and transferring technology (Basile and Germidis, 1984; Rondinelli, 1987; World Bank, 1992). EPZs have also been considered a key element in the promotion of manufactured exports (ILO/UNCTC, 1988).

A growing number of developing countries have established EPZs in the last few years. Their proliferation is a phenomenon that is likely to remain strong during the next few years in response to recent trends in international trade and production. In particular, the recent development of production techniques that enable the separation of labor-intensive stages from capital-intensive ones, as well as the development of more efficient transport systems, telecommunications and improved computer technology will continue to encourage multinational enterprises (MNEs) to shift some of their operations abroad. Several authors have already documented this increasing tendency towards higher levels of intra-firm trade and offshore production by MNEs (e.g., Kotabe and Scott, 1994; Blomström, 1990; Flagstaff Institute Databank, 1992).

Although EPZs may bring significant benefits, from the theoretical perspective the zones can also have negative welfare effects on the host nation. Furthermore, the accumulated experience with the zones indicates that the net results can vary greatly (World Bank, 1992; Basile and Germidis, 1984). Given the number of zones throughout the world and the trends just described, understanding the benefits and limitations of EPZs is extremely important for developing nations.

The purpose of this paper is threefold. First, it looks at EPZs from a worldwide perspective and attempts to draw useful lessons from the accumulated experience in several countries. Second, it examines the development and economic significance of the zones and similar export-oriented regimes in Central America. The paper ends with a set of conclusions and policy proposals for EPZ development in the region.

¹ The issue of whether export promotion and outward orientation cause higher rates of economic growth, or whether the causation runs the other way around, has not been unambiguously determined in empirical studies. For example, a study by the World Bank (1993) using data for more than 65 developing nations determined that those countries with higher proportion of manufactured goods in their exports achieved significantly higher levels of economic growth between 1960 and 1985. Using more sophisticated econometric techniques, other researchers have reached the same conclusion (e.g., Ghatak et al. (1997), Amoeteng and Amoako-Adu (1996), MaCarville and Nnadozie (1995)). Some authors, however, have found either that the causality runs the other way around (e.g., Henriques and Sadorsky (1996)), or mixed results (Boltho (1996), Ahmad and Harnhirun (1996)). Linneman (1996), contains a brief but good review of the recent literature on this topic, and offers some potential explanations for the ambiguous results.

2. The Concept of EPZ

Many different terms have been used to denominate the zones and some that may seem to apply to a single phenomenon correspond in fact to different regimes and activities.² For the purpose of this research, EPZs are understood as geographic zones (not necessarily industrial parks) established outside the customs territory of a particular country, where products can be stored, processed and manufactured without the payment of import duties, and with the intention of exporting most of the output. The fact that our definition limits EPZs to geographical areas within a country implies that Singapore and Hong Kong, where the entire territory is fundamentally an EPZ, are excluded. Furthermore, our definition limits the primary purpose of the zone as manufacturing for export. This requirement implies that the more than 200 free-trade zones that exist in the United States (Burns, 1995),³ and zones like Manaus in Brazil, more of an “import processing zone” than an EPZ (ILO/UNCTC, 1988), are also excluded. Although some may argue that this is a rather limited definition, it does include most of the export-oriented regimes in the Central America region, and we consider it the most appropriate for our purposes.⁴

Usually, firms in the EPZs have unrestricted access to import equipment and machinery, and are free from foreign currency regulations (World Bank, 1992; Warr, 1987; Kaplinsky, 1993; Fröbel et. al., 1980). Firms in the zones also normally receive generous fiscal incentives such as income tax exemption for a number of years, accelerated depreciation, and investment credits (Fröbel et al., 1980; Balasubramanyam, 1988). In some cases, they also have access to loans at preferential rates, and even guarantees against unionization of the work force (Warr, 1987; ILO/UNCTC, 1988).

3. A Global Overview of EPZs

Even though large-scale interest in EPZs has only grown rapidly in the last few years, the concept was developed almost 40 years ago. The first EPZ was established in 1959 in Ireland, near Shannon Airport (Roberts 1992). By the end of the 1960s, there were about 10 zones, most of them in Asia (Taiwan, Singapore, Hong Kong, and India), and Latin

² For example, Burns (1995) uses the term Free-Trade zones, which includes zones dedicated primarily to commerce and trading with almost no manufacturing process involved. The World Bank (1992) limits their study to what they call “fenced-in” EPZs. Grubel’s (1982) definition of Free Economic Zones encompasses a wide range of activities and regimes.

³ Manufacturing activities performed in these zones are mainly in the auto, appliance, and electronic industries. The United States market is the primary destination for these products (USITC, 1988), and the share of domestic value added in exports is unusually high (two-thirds according to USITC, 1988). The objective of many of the firms that establish operations in these zones is simply to defer the payment of import duties on parts and intermediate inputs (Crystal, 1993).

⁴ Strictly speaking, the so-called Special Economic Zones in China do fall under our definition. We do not, however, study them in detail here since they are a phenomenon in a one-of-a-kind country with very particular circumstances (e.g., the fact that some of the zones are located next to Hong Kong and Macao (Perkins, forthcoming; Burns, 1995)).

America (Mexico, Colombia, and the Dominican Republic). In the early 1970s the EPZ concept began to gain momentum. By the middle of the 1970s, there were at least 79 zones established in 25 countries (Fröbel *et al.*, 1980). The rapid growth in the number of zones continued in the late 1970s and 1980s. Between 1975 and 1986, employment in the zones grew at a rate of 9 percent per year, while exports grew an impressive 15 percent per year (ILO/UNCTC, 1988). Recent estimates count more than 200 EPZs in about 50 countries (Burns, 1995).

International comparisons of EPZs are difficult because comprehensive data for several countries over a number of years is scant, and empirical studies of EPZs that make comparisons among nations are rare. Several interesting patterns emerge, however, from the few previous studies that have attempted such comparisons.

The industries that are more likely to be found in the EPZs are labor-intensive lightweight manufactures, most commonly textiles and garments, electric and electronic products and components, food processing, metal products and machinery, optical instruments, and sporting goods and toys (Rondinelli 1987; Kreye *et al.*, 1987). By far the dominant activities in the zones are textile/garments, and electric/electronic industries.⁵ Table 1 shows the industry distribution of firms in the zones for selected countries.

Table 1
Industry Distribution of EPZ Firms in Selected Countries
(Percent)

Country	Year	Textiles and Garments	Electric and Electronic	Footwear and Leather	Sport. Items and Toys	Metal Prod. And Mach.	Other
Colombia ⁽³⁾	1985	46.0	10.0	3.0	0.0	23.0	18.0
Dom. Rep. ⁽¹⁾	1985	61.3	4.5	12.1	NA	NA	22.1
Jamaica ⁽¹⁾	1985	89.0	0.0	0.0	0.0	0.0	11.0
Mexico ⁽¹⁾	1984	10.0	54.3	2.0	3.1	14.7	15.9
Mauritius ⁽¹⁾	1986	91.0	0.0	1.0	2.0	3.0	3.0
Bangladesh ⁽¹⁾	1986	81.0	1.0	0.0	0.0	15.0	3.0
Korea ⁽⁴⁾	1980	1.9	47.6	5.0	NA	27.0	18.5
Malaysia ⁽²⁾	1984	13.0	58.0	0.0	6.0	6.0	17.0
Philippines ⁽³⁾	1980	43.0	13.9	8.2	NA	10.2	24.7
S. Lanka ⁽¹⁾	1981	89.9	2.0	NA	NA	NA	8.1
Taiwan ⁽¹⁾	1983	17.0	54.0	4.0	NA	6.0	19.0

Notes:

⁽¹⁾ By employment

⁽²⁾ By number of firms

⁽³⁾ Data by employment for one zone only (Bataan in The Philippines, Barranquilla in Colombia)

⁽⁴⁾ Data by investment for Masan Zone only

Sources: ILO/UNCTC (1988); Kreye *et al.* (1987); Rabbani (1980)

⁵ Burns (1995) indicates that these industries account for over 90 percent of activity in the zones.

As apparent in Table 1, a single industry tends to dominate EPZ activity in most of the countries, either the textiles/garments (textile for short) or electric/electronics industries (electronics for short). In all cases a single industry accounts for more than 40 percent of total EPZ activity, and the dominant industry tends to be at least three times larger than the second most important one. Electronics prevail in Mexico, Korea, Malaysia, and Taiwan, while textile leads in Colombia, the Dominican Republic, Jamaica, Mauritius, Bangladesh, Philippines, and Sri Lanka. There is evidence that once a particular industry begins to dominate activity in an EPZ, it tends to become overwhelmingly dominant (Roberts, 1992).

The vast majority of workers in EPZ firms are young women aged 16-25 years (Kreye *et al.*, 1987). The proportion of women in the labor force is inversely related to the age of the zone,⁶ and depends on the industrial composition of the firms in it. In fact, ILO/UNCTC (1988) contends that the large proportion of women in the labor force of EPZs is more a reflection of the industrial composition of the firms (fundamentally electronic and garments) than anything else.

EPZs seem to be well-fitted policy instruments for the attraction of FDI. For example, in Korea over 27 percent of total inward FDI was located in EPZs in the early 1970s (Healey, 1990). In Costa Rica, about 70 percent of all foreign companies that established operations in the late 1980s did so in EPZs (Brenes *et al.*, 1993).

Several researchers have also argued that working conditions in the zones are as good as or even better than outside them (e.g., Willmore, 1995). For example, ILO/UNCTC (1988) reports that working hours in EPZs in Mexico, Malaysia, Mauritius, and Sri Lanka were not very different from working hours in other manufacturing industries, especially in textile and electronic industries. Also, wages in EPZ firms tend to be roughly similar to those prevailing in the local manufacturing sector (ILO/ UNCTC, 1988; Basile and Germidis, 1984). Safety and health conditions have also been found to be better in EPZ firms than in comparable domestic enterprises (World Bank, 1992).

Finally, whether private development of EPZs leads to superior performance is an unresolved question. All zones in Asia can be considered public, and are often among the most successful EPZs in the world. The evidence suggests, though, that in most countries outside Asia the experience with public EPZs has been rather disappointing, some successes in the Dominican Republic and Jamaica notwithstanding. The failure of many of the public zones outside Asia is probably related to the fact that most of them have been established with the objective of achieving regional development, a role for which EPZs are not adequately suited (Kumar, 1987; ILO/UNCTC, 1988; World Bank, 1992).

⁶ In the Masan Zone in Korea, the proportion of women in the area decreased from over 90 percent in 1971 to 75 percent in 1979 (Rabbani, 1980). In Mauritius the proportion of men working in the zones grew from 20 percent in 1984 to over 33 percent in 1989 (Roberts, 1992). In Malaysia, it grew from 13 percent in 1972 to 28 percent in 1976 (Basile and Germidis, 1984).

Since EPZs in developing nations are fundamentally concentrated in East Asia and Latin America,⁷ it is useful to take a closer look at the development, special characteristics, and economic importance of the zones in these two rather distinctive regions.

3. 1 EPZs in East Asia⁸

EPZs are larger and more widespread in East Asia than in other regions. Among zones with five or more years of operation, the median zone in Asian countries has 10,500 employees, while in Latin America the median zone has just over 3,500 employees.⁹ In addition, while the three largest EPZ countries in East Asia account for about 70 percent of total activity (measured by employment), in Latin America and Africa that percentage exceeds 90 percent.¹⁰

Many of the most successful EPZs were established in Asia, especially Taiwan and Korea. Initially the zones in these countries attracted labor-intensive industries with relatively unsophisticated technologies (i.e., garments and electronics) that required large amounts of unskilled workers. In their evolution these EPZs did not commonly account for a high share in total exports. In Taiwan exports from the zones represented about 8 percent of the total, while in Korea they represented about 3-4 percent. Furthermore, both countries were very successful in diversifying away from the low-skill labor-intensive industries that sprang up in EPZs in their first years of operation,¹¹ and in promoting linkages between local industries and the firms in the zones. In the Masan Zone of Korea (see Box 1), for example, the zone administration gave technical assistance to local suppliers and sub-contractors. In Taiwan, under government guidance, personnel from firms in the zones were placed at potential suppliers' factories to offer advice in production methods, and quality control. As a result of this effort, the domestic value added of the Masan zone in Korea increased from 27.8 to 52.2 percent between 1971 and 1979. In Taiwan, local supplies increased from 8 percent of total imports to 46 percent between 1969 and 1979.

⁷ According to ILO/UNCTC (1988), these two regions account for nearly 90 percent of world EPZ employment.

⁸ For an analysis of EPZs in East Asia and the Masan zone in Korea, see Rabbani (1980), Gil Van (1980), Basile and Germidis (1984), Balasubramanyam (1988), World Bank, (1992) and Willmore (1995).

⁹ Calculated from data in World Bank (1992, pp. 32-36).

¹⁰ Calculated from data in ILO/UNCTC (1988, p. 9).

¹¹ New garment firms are not allowed in Taiwan's EPZs since 1974.

Box 1: The Masan Zone in Korea

The Masan Zone was inaugurated in 1971. By 1979 the Zone had attracted 94 firms with a total investment of \$114.6 million, and had created more than 31,000 manufacturing jobs. Almost half of investment was in the electric/electronics industries, while textiles accounted for a very small share (less than 2 percent). More than 90 percent of foreign investment in the zone was Japanese while 8 percent was from the US.

When the zone initiated operations in 1971, domestic firms supplied just 3.3 percent of materials and intermediate goods to firms in the zone. Four years later, that percentage had increased to 25 percent and eventually reached 44 percent. Consequently, the domestic value added steadily increased from 28 percent in 1971 to 52 percent in 1979. In all, the evidence indicates that the Korean government was very successful in encouraging backward linkages with local industries and sub-contractors. Preferential access to intermediate goods and raw materials was given to local companies supplying EPZ firms. Also, the zone administration provided technical assistance to sub-contracting firms.

Technology transfer was always rather limited, occurring mostly in the electronics industry. It is estimated that between 3,000 to 4,000 persons received specialized training in the zone and abroad (especially Japan), and that half of them eventually left the zone to work in local electronic Korean firms.

Overall, the Masan Zone contributed greatly to the development of the region where it was located. The development of ancillary industries and services in the surrounding region was especially noticeable. The economic importance of the zone, however, declined with the development of large industrial conglomerates in the adjacent areas.

3. 2 EPZs in Latin America¹²

Contrary to popular belief, EPZs in Latin America are not a new phenomenon. The first EPZs in the region were inaugurated in Colombia (the Barranquilla zone in 1964) and the Dominican Republic (La Romana in 1965).¹³ Other countries quickly followed. The maquiladora program in Mexico began in the mid-1960s, when the government created the Border Industrialization Plan. Guatemala, Honduras and El Salvador inaugurated their first EPZs in the early 1970s. A few years later, Nicaragua (1976), Jamaica (1976), and Costa Rica (1981) inaugurated theirs. Except in the Dominican Republic, the governments developed and administered the zones aiming to achieve regional development.

¹² For further analysis of EPZs in Latin America see Teutli (1980), ILO/UNCTC (1988), Grunwald (1991), Kaplinsky (1993), Burns (1995), Mata (1995), Mortimore *et al.* (1995) and Willmore (1995).

¹³ A distinctive characteristic of this zone was that it was developed by the private sector, specifically by the Gulf and Western Corporation.

EPZ activity in Latin America is highly concentrated in three countries: Mexico, Brazil and The Dominican Republic. The maquiladora program in Mexico alone accounts for over 65 percent of employment in EPZs in the region. In 1994 maquiladoras in Mexico employed more than 600,000 workers and accounted for 48 percent of U.S. imports from that country. Initially a high share of the maquiladoras produced garments and electronic products. Later, a more diverse group of industries emerged under the program. Backward linkages, however, never really formed,¹⁴ somewhat paradoxically given Mexico's large and well-diversified industrial sector. This exemplifies that the development of these linkages may not occur without the proper incentives.

In The Dominican Republic there are currently more than 19 EPZs, that employ about 141,000 workers. The importance of the zones for the country's economy cannot be overemphasized. EPZ firms account for a very high share of exports, especially manufactured exports, and employment. Moreover, some of the zones in The Dominican Republic are among the largest EPZs in the world; both the Santiago and the San Pedro de Macoris zones employ about 35,000 workers each. Similarly to Mexico, backward linkages with the domestic economy have been difficult to achieve. See Box 2.

One of the most striking differences between East Asian and Latin American EPZs has been the success of the East Asian governments in actively promoting these backward linkages. As a consequence, in East Asia, the share of locally purchased inputs (and of domestic value added) steadily increased after the first few years of EPZ operations. In the Latin American case, governments seem to have used EPZs mostly as instruments to generate employment and foreign exchange, and backward linkages have been rare. On the other hand, Latin American zones achieved a much higher share in manufacturing employment and exports than those in East Asia.

3.3 Contrasting EPZs in the Textile and Electronic Industries

A very high proportion of EPZ activity around the world is in the electric/electronic and the textile/garments industries, that have changed dramatically in the last 25 years. Within international trade and offshore manufacturing, these industries are among the most dynamic (Mortimore, 1995; Bolin and Ozmun, 1989).

Increasing international competition in the textile industry and the establishment of import quotas in the developed world have strongly affected how and where garments are manufactured. To be able to compete with the low-cost garment producers of some East Asian countries (especially Hong Kong, Taiwan and Korea), many firms in developed countries have been shifting the labor intensive stages of production to countries where wages are just a fraction. In addition, firms from countries with binding quotas migrated to locations where quota restrictions are less stringent or absent (Roberts, 1992; Choi, 1995; World Bank, 1992). These companies have found the EPZs of the developing world an ideal place to establish offshore operations.

¹⁴ Raw material purchases from domestic firms represent just about 2 percent of the total (Grunwald, 1991).

Box 2: EPZs in the Dominican Republic

The US Gulf and Western Corporation developed the first EPZ in the Dominican Republic (La Romana) in 1965. Fueled by the success of this first zone, two more zones were inaugurated in the early 1970s. Not until the middle of the 1980s however, did EPZs become widespread throughout the country. By the end of the decade, the Dominican Republic was the fourth largest EPZ country, as measured by employment. In 1989, Dominican zones accounted for 56 percent of manufacturing employment and the creation of more than 141,000 jobs. In addition, net foreign exchange earnings from EPZ operations grew from 5 percent of the total in 1980 to 21 percent in 1989. By 1993, EPZs were the largest generators of foreign exchange.

The zones in the Dominican Republic specialize in garments and textile products. Altogether these industries account for 60-70 percent of employment and firms in the EPZs. Another 10-12 percent of activity consists of footwear and leather industries, and electric and electronic firms account for less than 5 percent of activity in the zones.

U.S. investors own half of the more than 300 firms in the zones. 25 percent are owned by domestic investors, while Korean and Taiwanese ownership accounts for an additional 12 percent. More than 95 percent of exports go to the U.S. market with a high proportion of textile and garments enter the U.S. under the HTS 9802.00.80 (former provision 807) of the U.S. tariff code.

During the 1980s the share of domestic value added in total output decreased. In the early 1980s the value added was between 40-45 percent, but toward the end of the decade it was just 25-30 percent. Accordingly, backward linkages between domestic firms and industries in EPZs have been very low. One reason for this decline is the lack of government interest and adequate incentives. Until 1993, domestic firms needed an export license that was difficult to obtain to sell products to firms in EPZs. In addition, even though the legislation stated that firms could recuperate import duties paid for materials used in products sold to EPZ firms, in reality, firms were almost never able to recuperate the duties. The lack of competitiveness of the Dominican industrial sector with respect to quality, timing of delivery, and price also contributes to the absence of linkages.

The most enduring positive impact of EPZs in the Dominican Republic is the creation of more than 141,000 jobs in an economy that has suffered from unemployment rates as high as 30 percent.

Changes in offshore production in the electronics industry have been equally dramatic. Offshore activity in the electronics industry has outpaced that of the textile industry in the last two decades. Between 1975 and 1986, EPZs' employment in the electronics industry increased by 316,500 new jobs, while employment in the textile and garments sub-sectors increased by 197,500 (ILO/UNCTC). Between 1980 and 1992,

imports of electric and electronic products by OECD countries increased more than imports of any other category, including textiles (Mortimore *et al.*, 1995).

Table 2 shows the number of jobs created by the textile and electronics sector around the mid-1980s for 13 countries for which detailed data was available. It shows that the EPZs of more countries specialize in textiles (8 out of 13), although in terms of total jobs, the textile industry has generated far fewer jobs than the electronics industry.

The degree of industrial development of the host nation affects the industrial specialization of EPZ activity. Figure 1 depicts the degree of country specialization in the textile industry against the natural logarithm of the host economy's industrial GDP. A pattern showing a negative relationship is clearly evident, that is, the greater the industrial GDP, the lower the share of textiles in EPZ employment. Of course, the small sample size limits the power of any statistical test.¹⁵ Figure 1, however, casts strong doubts on the argument given by ILO/UNCTC (1988) that EPZ specialization in either the electronics or the textile industry results largely from random factors.

Table 2

Estimate of EPZ Jobs Created in the Textile and Electronics Industries

Country	Year	Textile (%)	Electronic (%)	Employment In 1986	Textile Jobs	Electronic Jobs
Colombia ⁽¹⁾	1985	46.0	10.0	6,700	3,082	670
Dominican Rep.	1985	61.3	4.5	36,000	22,068	1,620
Jamaica	1985	89.0	0.0	8,000	7,120	0
Mexico	1984	10.0	54.3	250,000	25,000	135,750
Brazil	1982	6.5	40.1	63,000	4,095	25,263
Bangladesh	1986	81.0	1.0	4,515	3,657	45
Korea ⁽¹⁾ ⁽²⁾	1980	1.9	47.6	140,000	2,660	66,640
Malaysia ⁽³⁾	1984	13.0	58.0	81,688	10,619	47,379
Philippines ⁽¹⁾	1980	43.0	13.9	39,000	16,770	5,421
S. Lanka	1981	89.9	2.0	35,000	31,465	700
Taiwan	1983	17.0	54.0	80,469	13,680	43,453
Mauritius	1986	91.0	0.0	61,690	56,138	0
Egypt	1980	54.0	0.0	25,000	13,500	0
Total employment					209,854	326,941

Notes:

⁽¹⁾ Data for one zone only (Bataan in The Philippines, Barranquilla en Colombia and the Masan Zone in Korea)

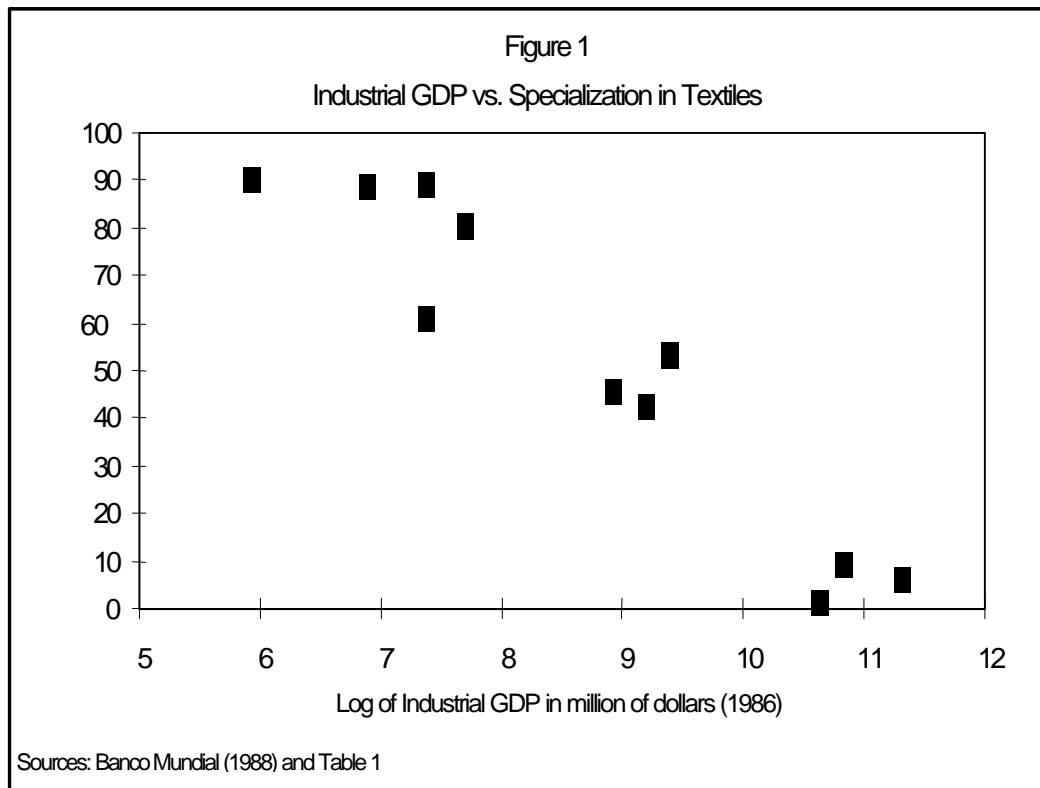
⁽²⁾ Data by investment

⁽³⁾ Data by number of firms.

Sources: ILO/UNCTC (1988); Kreye et al. (1987); Rabbani (1980)

¹⁵ Simple regression analysis results in a coefficient significant at the 1 percent level, with an adjusted R-squared of nearly 0.90.

Some authors suggest that because of the nature of the manufacturing process, the electronic industry should generate more linkages with the domestic economy than other sectors (Dunning, 1993). Others contend that linkages between firms in the EPZs and the domestic economy are difficult in any industry, but particularly so in the textile industry (ILO/UNCTC, 1988; Basile and Germidis, 1984). The accumulated experience of several countries tends to support these assertions. For example, Roberts (1992) shows that in Mauritius, where EPZs are highly specialized in textiles, domestic value added is low (as a percentage of exports declined during the 1980s). In the Dominican Republic, another country where the textile industry dominates EPZ activity, the domestic value added is also low and decreased during the 1980s (Kaplinsky, 1993). Evidence from imports into the U.S. under the HTS 9802.00.80 category (former provision 807) also shows a tendency for a smaller domestic value added in the offshore processing of garments over time. Moreover, Mortimore *et al.* (1995) showed that the domestic value added in textile EPZs decreased between 1989 and 1992 in 6 out of 9 countries.



On the other hand, some of the countries whose EPZs specialized in electronics (including Korea, Taiwan, Malaysia and India) have increased the share of domestic value in total output with time (Healey, 1990; Rabbani, 1980; Basile and Germidis, 1984). The Santa Cruz Electronics Export Processing Zone in India, for example, has achieved domestic value added of over 50 percent (Makhija, 1980). While suggestive, this cannot be taken as unequivocal proof that firms in the electronic sub-sectors are more likely to form backward linkages than other types of firms. Empirical testing that controls

for the size and development of the industrial sector in the host nation is needed to disentangle the effect of both industry and country specific variables.¹⁶

Another significant difference between textile and electronic firms in EPZs is relative capital intensity. Investment in the electronics sub-sector is much more capital intensive. For example, in Taiwan from 1969 to 1979 average investment per employee in electronic firms was \$17,145, while in textile firms it was just \$1,794 (Rabbani, 1980). In the Dominican Republic between 1989 and 1993, investment per employee in electronic firms was \$16,209 while that in textile firms was just \$3,575 (Mortimore *et al.*, 1995).¹⁷ It seems logical to assume that more capital intensive firms have less flexibility to move from one place to another when economic conditions change. Thus, capital intensity may correlate inversely with “footlessness” of EPZ firms. This, however, is an issue that merits more empirical analysis.

4. EPZ Theory

The economics literature contains few published works of analytical depth on EPZs. The theoretical literature by and large addresses two questions. First, researchers have tried to determine if the host country’s welfare is higher with foreign capital invested in an established EPZ or whether it is higher with the same amount of foreign capital invested elsewhere in the domestic economy. Second, researchers have compared the host nation’s welfare before and after the establishment of EPZs (i.e., assuming that FDI would not occur without the EPZ).

Hamada (1974) made the first attempt to study rigorously the welfare implications of EPZs and to answer these two questions. In a standard 2x2 Heckscher-Olin (H-O) model,¹⁸ where the capital intensive good is protected by a non-prohibitive import tariff, he shows that FDI in the EPZ and in the domestic zone (DZ, the rest of the domestic economy) are both welfare decreasing.¹⁹ The economic intuition is relatively simple. Increased capital in the EPZ attracts labor from the DZ. By the Rybczynski Theorem, output of the labor intensive good in the DZ decreases, while output of the capital-intensive good increases, worsening the distortion created by the tariff and lowering

¹⁶ Regarding this issue, ILO/UNCTC (1988) contends that a higher share of domestic value added in total output from EPZs seems to be more a function of the industrial development of the host nation than of the specific industry in which the EPZs specialize.

¹⁷ Mortimore (1995) finds many other interesting differences between electronic and garment firms in the EPZs of the Dominican Republic. Among them, that electronic firms are more dynamic and aggressive, are more technologically sophisticated, have a higher proportion of foreign ownership, and are more interested in increasing their international market shares than simply reducing production costs.

¹⁸ This is a model with 2 factors of production and 2 goods that are produced under constant returns to scale. One of the goods is relatively more capital intensive for all wage/rental-rate combinations. In all cases it is assumed that production is not completely specialized.

¹⁹ This is the well known “immiserizing growth” result of Brecher and Diaz-Alejandro (1977).

national welfare.²⁰ His analysis also shows that foreign capital invested in the EPZs is potentially less damaging to the host nation than the same amount of foreign capital invested in the DZ.

Eight years later, Hamilton and Svensson (1982) showed that Hamada's conclusion regarding the relative ranking of FDI in the EPZ and in the DZ was incorrect. These authors also based their analysis on a standard H-O framework, but observed that Hamada's result depends on the assumption that the labor intensive good was not produced in the EPZ. According to their conclusions, FDI in a tariff-ridden, small-open-economy is indeed welfare reducing no matter where it is located, but FDI in an established EPZ reduces welfare relatively more than the same amount of FDI to the DZ.²¹

Wong (1986) resolves the seeming conflicting conclusions of Hamada, and Hamilton and Svensson. According to Wong, the conflicting results are caused by different assumptions regarding what product was produced in the EPZ, what product was used to repay local as well as foreign factors of production, and whether these payments were taxed or not. Wong's most important conclusion is that FDI both in EPZs and in the DZ result in the same welfare level for the host economy as long as only one good is produced in the EPZ and that good is used to repay factor owners.

Even though Wong's analysis determines that foreign investment in EPZs is not inferior to investment in the rest of the economy, its welfare decreasing effect in a tariff-ridden economy remained unchallenged until the standard 2x2 H-O model was extended. For example, Miyagiwa (1986) constructs a model with three factors (land, labor, and capital) and three goods (food, and two types of industrial goods). Initially, the country produces only food and one industrial good. The government establishes an EPZ with the intention of diversifying the manufacturing sector and offers a subsidy to foreign firms for that purpose. Miyagiwa shows that, under certain conditions,²² the host nation can increase welfare by establishing an EPZ and attracting FDI that diversifies production. The intuition behind this result comes from the general theory of second best: if a previously existent distortion (the tariff) cannot be removed completely, the introduction of a countervailing distortion (the subsidy) might improve national welfare.²³

²⁰ In a comment to Hamada's work, Rodriguez (1976) argued that if capital was perfectly mobile between the EPZ and the rest of the economy, the host country could attain the same level of welfare that can be achieved under a free trade regime.

²¹ These authors termed FDI into the EPZ as *labor outflow*, and FDI into the domestic zone as *capital inflow*, a terminology later used by other researchers (e.g., Wong, 1986).

²² Namely, that the export subsidy is small relative to the import tariff, and that the impact of the subsidy in the output of the industrial good previously produced in the country is large relative to the impact in the output of the diversifying good.

²³ Of course, this needs not to be the case. For a discussion see Wong (1995).

Other extensions of the earlier models include the introduction of unemployment (Young and Miyagiwa, 1987), and capital mobility (Chaudhuri and Adhikari, 1993). All previous theoretical treatments assume full employment, which does not capture the reality of many developing countries. Young and Miyagiwa introduce unemployment of the Harris-Todaro type and argue that the formation of EPZs may be a sound second-best policy that increases national welfare. Chaudhuri and Adhikari introduce inter-sector capital mobility, and an upward supply function for foreign capital to conclude that the welfare effects of EPZ formation are ambiguous, even in the presence of Harris-Todaro unemployment.

Finally, Din (1994) develops a model that incorporates a sector of domestically produced intermediate inputs, focusing on backward linkages between firms in the EPZs and the domestic economy. In a three-sector general equilibrium setting, he shows that if the domestically produced intermediate good is internationally traded, the formation of an EPZ will leave national income unchanged. If the intermediate input is non-traded, then whether the formation of a zone will increase national welfare depends on the good being relatively labor or capital intensive. It also depends on whether the good produced in the EPZ is more labor to intermediate-input intensive than the other final good produced in the economy.

Summary of EPZs Theory

Thus, theoretical treatments of EPZ formation teach us that EPZs are a second best policy, whose welfare implications are often ambiguous. In more traditional and simplistic models, the creation of EPZs in a tariff-ridden small open economy tends to decrease national welfare, but no more than FDI elsewhere in the host nation. In more complex models that incorporate intermediate goods and unemployment, the formation of EPZs might improve national welfare, but the end result is model-specific, depending on things like the relative capital intensity of different sectors, inter-sector capital mobility, and whether intermediate inputs are internationally traded.

There are, however, some limitations to the theoretical treatments discussed above. First, the analyses do not consider distributional issues that may be important for welfare considerations. Second, all treatments are static in nature, and ignore things like gradual transfer of technology, improvement of domestic labor and managerial skills (Balasubramanyam, 1988), the benefits of outward orientation (World Bank, 1992), and learning effects for domestic firms (Hamada, 1974). Given the present state of theoretical development, only further empirical investigations can shed light on the net benefits of EPZs.

5. Empirical Analysis of EPZs

In reviewing EPZ performance, it is necessary to keep in mind the host government's objectives in establishing an EPZ. In general, there are five principal sources of benefits a government may be seeking: i) generation of employment; ii) generation of foreign exchange; iii) attraction of foreign capital and technology; iv) acquisition of superior labor and management skills; and v) creation of linkages between EPZ industries and domestic firms. The zones also generate costs that can be substantial and include infrastructure expenses, subsidies in public services (e.g., electricity or access to credit at preferential rates), and administration of the industrial complex.

Leaving aside considerations of income distribution, perhaps the best way to determine the net contribution of the zones is a detailed cost/benefit analysis. Peter Warr, whose work was published in several articles during the 1980s, pioneered this kind of research. Although it has strong appeal, approximations, assumptions and rough estimates limit its practical applications. In addition, the analysis ignores externalities and intangibles like technology transfers and upgrading of local skills, which are very hard to quantify (Kumar, 1987; Baissac, 1996) but are among the main objectives for establishing EPZs. Despite these limitations, Warr's analysis does give an indication of the relative importance of different sources of benefits and costs. It uncovers key issues that host governments need to consider when establishing EPZs.

5.1 Warr's Cost/Benefit Analysis

The cost/benefit analysis tries to measure the net benefit from the presence of the zone as opposed to the gain that would occur if those resources were used elsewhere in the economy. The crux of the analysis resides in accurately estimating the different streams of benefits and costs for several years, as well as their opportunity costs. The calculation of the net benefit also requires the estimation of a social discount rate, which is the subject of much discussion.²⁴

Among the streams of benefits considered in this kind of analysis are the net foreign exchange generated, employment created, revenues raised from renting or selling factory space, domestic raw materials sold, and taxes raised.²⁵ Among the main costs are infrastructure expenses, public services provided, access to financing at preferential rates, and EPZ administrative costs.

The estimation of some sources of benefits is fundamentally straightforward, such as the revenue raised by renting and selling factory space, income raised by taxation of EPZ firm profits, and duties paid for sales in the domestic market.

²⁴ See for example Warr and Wright (1981).

²⁵ Warr (1987) identifies two additional potential sources of benefits: sales in the domestic market, and firm's profits. In the case of local sales, he argues that prices paid by consumers in the domestic market reflect the marginal value given to these items, and thence have no welfare effects. In the case of firm's profits, he assumes that all EPZ industries are foreign-owned, and therefore their profits or losses are irrelevant for the host nation's welfare.

Estimations of other sources of benefits, however, are more difficult. Strictly speaking, the net generation of foreign exchange does not represent a benefit for the host economy, unless the official exchange rate is overvalued and firms in the EPZs are required to deposit their receipts with the central bank. If this is the case, the social value of a unit of foreign exchange is higher than the official rate and the deposit of receipts with the central bank constitutes a form of taxation. The calculation of the net benefit from the generation of foreign exchange then requires a difficult estimation of its shadow price.

Likewise, the host nation gains from the generation of employment only if wages paid to workers in EPZ firms exceed their shadow price. That the majority of workers in most EPZ firms are women between the ages of 16 and 25, whose alternative possibilities of employment may be limited, makes the estimation of this price especially difficult (Warr, 1987).²⁶

The social gain derived from supplying local raw materials and inputs to firms in the zone is also complicated to calculate. The host country derives a net benefit only if the social cost of producing these items is smaller than the price that EPZ industries pay for them.²⁷ Here again non-trivial assumptions are needed to estimate these costs.²⁸

Similar constraints apply to estimating expense sources. The calculation of social cost requires the estimation of shadow prices, but the numerous regulations in trade, labor, and financial markets in most developing economies make this challenging.

Cost/benefit exercises have nonetheless revealed some interesting patterns. The calculation of the benefit derived from both foreign exchange and employment generation turned out to be the most important sources of benefit for the host economy. According to Warr (1987), over 90 percent of the total benefit in present value terms was generated by these two items alone in the Bataan Zone of the Philippines. In Korea and Malaysia, the percentage was somewhat smaller (between 75-85 percent), but still represented the bulk of the benefit. Purchases of local supplies and raw materials constituted between 3 and 16 percent of total benefits in Malaysia, Korea, Indonesia, and the Philippines.²⁹ In general, tax collections tend to be very small, even in countries that do not offer income tax holidays.³⁰

²⁶ For a discussion of additional difficulties in estimating the opportunity cost of labor see ILO/UNCTC (1988, pp. 127-28).

²⁷ Recall that an assumption in this analysis is that all firms in the EPZ are foreign-owned.

²⁸ See for example the discussion in Warr (1987, pp. 231-232).

²⁹ Calculated from Warr's (1989a) data published by Healey (1990).

³⁰ This is the case in Mexico (Burns, 1995), and in the Philippines (Warr, 1987), where EPZ firms operate as cost centers generating no profits.

Among the costs incurred by the host economy in setting up EPZs, infrastructure expenses, including the construction of factory space, tend to be the largest. The second and third sources of costs were the administrative expenses associated with managing the industrial estate, and the provision of public services (mostly electricity) sometimes at subsidized rates (Warr, 1989). Finally, if investment in the EPZs is financed significantly by local borrowing at rates below the marginal productivity of capital, it may become a substantial component in the total cost of establishing EPZs. This was the case in the Philippines where over 90 percent of capital investment was raised domestically (Warr, 1987).

Of the four zones studied in detail by Warr, those located in Malaysia, Indonesia, and Korea achieved relatively high internal rates of return, over 15 percent in real terms. Only the Bataan zone in the Philippines showed negative results, mostly due to high infrastructure costs and access to local financing at artificially low rates.

5.2 EPZs as Determinants of FDI Location

What is the role of EPZs and other variables in determining the location of FDI? Three recent studies are worth mentioning here. Woodward and Rolfe (1993) examine the determinants of location of export-oriented affiliates of U.S. multinationals in the Caribbean region. Using a Conditional Logit model and data from more than 20 countries, they test 12 different variables and find eight of them to be significantly correlated to their measure of export-oriented activity (i.e., the number of U.S. affiliates in each Caribbean nation). Among the variables with a positive correlation are per capita GNP, the length of income tax holidays, the existence of EPZs, and exchange rate devaluation. Negatively correlated are wage rates, profit repatriation restrictions, the inflation rate, and transportation costs. Interestingly, the probability of location is most sensitive to changes in the wage rate. Location is also highly sensitive to per capita GNP. The sensitivity of location with respect to the existence of EPZs, although significant, is relatively small.

In a similar study, Kumar (1994) examines the effect of nine variables on the propensity of U.S. multinationals to establish offshore manufacturing operations. Using data for 40 countries and ordinary least-squares techniques, he confirms some of Woodward and Rolfe's results. For example, he finds the wage rate to be negatively related and the existence of EPZs to be positively related to the propensity of U.S. multinationals to set up offshore manufacturing operations. Furthermore, he finds that the share of manufactured exports in total host country exports has an important and positive effect on the location of these operations. Fiscal incentives given to affiliates of U.S. multinationals do not appear to be a significant determinant of location.

Finally, Choi (1995) investigates the effect of nine variables in the location of export-oriented FDI by U.S. multinationals in the textile industry. Using data for 47 countries he confirms that the existence of EPZs helped in attracting U.S. FDI, but found that the wage rate was not a significant factor. He also finds that exchange rate

depreciation is positively and significantly related with export-oriented activity and that political stability ratings and the inflation rate have no apparent effect. His results, however, have to be interpreted with caution since most of his regressions include a dependent variable normalized by the host country's population, a procedure for which he offers no theoretical justification.

In sum, the wage rate, the existence of EPZs, and some measure of economic development of the host nation (e.g., per capita GNP or the share of manufactured exports) all seem to be significant determinants for the location of export-oriented FDI.

6. The Role of EPZs

After reviewing theory and actual experiences of EPZs, it is important to ask under what circumstances the host nations are more likely to benefit from the establishment of EPZs, and what role they could and should play in developing countries.

Theoretical work on EPZs shows that the establishment of zones is more likely to improve the host nation's welfare when two conditions exist: 1) when there are relatively large levels of unemployment; and 2) when EPZ firms form strong backward linkages with intermediate-producing local firms (see section 4).

In developing nations with relatively high levels of unemployment, EPZs might represent an efficient mechanism for reducing the economic and social burden of large pools of unemployed people. In this case, as Warr's cost/benefit calculations show, EPZs can have significant net positive effects on the host economy since wages paid to people employed in EPZ firms tend to be much higher than their opportunity cost.

With regard to backward linkages, the experience with EPZs has shown that those countries (mostly in East Asia) that made a special effort to create those linkages seem to have benefited more from the creation of the zones. The experience in countries like Mexico also demonstrates that these linkages are not easily developed and that a relatively large and well-diversified industrial sector does not alone guarantee their formation.

Recall, however, that the theoretical considerations regarding backward linkages discussed in Section 4 are purely static. The creation of these linkages may be also desirable in light of dynamic considerations, an issue stressed in the development literature (Caves, 1996). Both backward and forward linkages created by foreign firms may generate enough demand for (or supply of) intermediate goods and services such that entire sub-sectors of industries that otherwise would not exist become viable. Thus, under these circumstances FDI in EPZs may be directly linked to higher levels of economic activity and growth.³¹ In addition, foreign firms often provide training in

³¹ For example, according to Caves (1996), Lin (1993) showed that the presence and growth of an export-processing sector exerts a positive influence on aggregate economic growth using data for 23 developing nations.

quality control and technical assistance while working with local suppliers. These improve the host nation's labor and managerial skills, another dynamic consideration that makes linkages between EPZs and local firms highly desirable.

An important lesson derived from EPZs in several nations is that host economies have limited possibilities to benefit from taxation of EPZ activity. The current income tax provisions coupled with the prevailing tariff schedule in many developed nations, gives MNEs strong incentives to operate their export-oriented affiliates as cost centers. For example, in the United States, parent companies may claim an income tax credit for taxes paid by a foreign affiliate that completely offsets their income tax liability in the U.S. Thus, in the absence of import tariffs, the U.S. MNE should be indifferent to a price transfer scheme that shifts profits from one location to another since the firm will end up paying the same amount on income taxes, i.e., the corresponding U.S. corporate rate.³² If, however, the parent firm buys products from its foreign affiliate, and these products are subject to import duties when entering the U.S. customs territory, then the MNE has an incentive to declare the lowest price possible for these goods in order to minimize import duty payments. This means foreign affiliates operate as cost centers, and probably explains why many foreign firms in EPZs operate with no profits and even losses for many years.

Many authors have suggested that EPZs are useful instruments for economic development but are only transitory as policy instruments during the first phases of industrialization and implementation of export-led growth strategies (e.g., World Bank, 1992; Rondinelli, 1987). As countries achieve higher levels of economic development and income, the relative significance of EPZs in economic terms can be expected to decline. Thus, developing nations embarked on export-led growth strategies cannot rely solely on EPZs to achieve higher levels of income and economic growth in the long-term. They should acknowledge the transitional aspect of EPZs, and manage wisely the opportunities they may bring to upgrade labor and managerial skills, acquire superior technology and access foreign markets. For the same reason, EPZs should not replace economy-wide trade and financial reforms required to support a long-term outward-orientation commitment. Rather, they should be part of a more extensive package of policies aimed at improving the international competitiveness of the host nation.

7. EPZs in Central America

The remaining parts of this paper examine the development, economic significance, and other economic characteristics of EPZs and similar export-oriented regimes in Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua. The analysis starts with the legislation and development of EPZs in each of the countries and turns next to their economic significance. It concludes by examining ownership and industry distributions, wages and labor conditions, and the creation of backward linkages in the host economies.

³² This is the argument that some authors give to explain why income tax holidays offered by the host nations should not matter for the location of outward FDI by U.S. multinationals.

A note of warning is necessary here. Comprehensive and reliable data for export-oriented regimes in Central America does not exist. Often, statistics are available for some regimes, but not for others. Thus, in several of the sections that follow, data from different subsets of firms are used, and the comparisons among countries are made only with great caution.

7.1 Legislation and Development

Table 3 compares the most important characteristics of EPZs as well as other export-oriented regimes in Central America. The important differences across countries in the region, as well as the similarities, are discussed at length below.

Costa Rica

Legislation

Export-oriented industries in Costa Rica operate under any of two different laws: The Regime of Temporary Admission (RTA) and the EPZ Law.³³ The government of Costa Rica promulgated these regimes in the early 1980s as part of an export-led growth strategy.

RTA: Firms operating under the RTA regime may be located anywhere within the country. After posting a bond with the fiscal authorities, they may import raw materials, equipment and machinery free of duties. These firms do not, however, enjoy special customs considerations and must follow normal import procedures. In addition they do not have income, municipal or asset tax exemptions,³⁴ and must pay a 15 percent tax on profit or capital repatriations. Local sales are not allowed.³⁵ Benefits are given for five years and can be extended upon request.

EPZ: The EPZ Law stipulated that only the public sector could develop and administrate export-processing zones. In 1984, the law was reformed, permitting private development of EPZs, and the first such concession was awarded. In 1988, a public auction was held and concessions were awarded to five private

³³ Two additional regimes under Costa Rican legislation deserve mention: the draw-back regime, and the Export Contract (EC) Law. The first one has remained practically unused because firms cannot recuperate paid taxes and/or duties in a reasonable time, and because the other regimes offer better benefits. The EC Law, enacted in 1984 to stimulate non-traditional exports to third-markets (i.e., markets outside the Central American Region), was reformed several times in the early 1990s. These reforms reduced the benefits to firms that already had Export Contracts, and stipulated that no new Contracts were to be conferred. Currently, all remaining Contracts will expire in 1999. Furthermore, industrial firms operating under the umbrella of this Law exported only about 40 percent of their output between 1991 and 1995 (Cenpro, 1996c, Tables 2 and 4), and thence do not conform to our definition of EPZ firms (see Section 2). Because of these reasons, we do not include the analysis of the EC regime here.

³⁴ Firms in this regime had these benefits, but they were abolished in 1992.

³⁵ These firms can sell products or intermediate inputs to other export-oriented firms located in Costa Rica as long as these are incorporated in goods exported outside the Central American region.

developers. In 1990, another public auction was held, and two additional concessions were approved. A modification to the law was introduced in 1990, when for the first time EPZ status could be given to firms outside industrial parks.

The EPZ Law gives both export-oriented firms and developers several incentives. To developers, the law provides income tax and import duty exemptions for 10 years. These incentives, however, were abolished in 1992, a factor that may have prevented subsequent development of new zones (Alonso, 1997).³⁶ To EPZ firms, the law gives an income tax holiday for eight years, plus 50 percent exemption for four additional ones for manufacturing operations. The length of tax holidays for commercial firms, whose activities have to be related to manufacturing operations at the zone, are shorter (see Table 3 for details). Both types of firms also enjoy exemption from import duties on raw materials and equipment, exemption from municipal, sales and other taxes, as well as streamlined import/export procedures. The law gives additional incentives to firms that establish operations in economically depressed areas, and permits up to 40 percent of output to be sold in the local market upon payment of the corresponding import duties and approval by the Ministry of Economy.³⁷ EPZ firms are not subject to withholding taxes on repatriated capital or profits, and can manage foreign exchange freely.

Development

The first two EPZ zones in Costa Rica were established in the early 80s in two port cities in the country, Puntarenas and Limón. As with many zones in economically depressed areas of other nations, the two EPZs there were not a success (Brenes *et al.*, 1993). Only a small number of firms located there and the zones have had continuous legal and infrastructure problems.

Private zones have been much more successful. The first privately developed zone began operations in 1985 in Cartago and quickly attracted many export-oriented companies. Activity in EPZs accelerated with the award of seven additional concessions to develop private EPZs in 1988 and 1990. All parks were established near urban centers in Alajuela and Heredia, not far from the capital San Jose (Brenes *et al.*, 1993). There are currently eight privately developed EPZs in Costa Rica.

Costa Rican export processing industrial parks currently hold about 150 export-oriented firms. Additionally, there are about 40 firms outside industrial parks with EPZ status (permitted by the 1990 modification of the law). EPZ firms inside and outside industrial parks employ about 24,200 workers (Procomer, 1996).

Information about the development of the RTA regime is more scant, but does show that a few more than 80 firms, employing almost 20,000 workers, operate under this regime (Cenpro, 1996b). Combined, the EPZ and RTA regimes currently have about 270 firms and employ more than 44,000 workers (see Table 4 below).

³⁶ At the time of this writing there is a proposal pending discussion in the Costa Rican congress to reestablish these incentives for EPZ developers.

³⁷ The law stipulates that approval to sell domestically will be given only if there is no local production.

Honduras

Legislation

There are three different laws under which export-processing industries may operate in Honduras: 1) The Free Zone (FZ) Law, approved by the Honduran government in the early 1970s; 2) The Regime of Temporary Admission (RTA) of 1984; and 3) The Export Processing Zone (EPZ) Law, enacted in 1987.³⁸

The FZ Law makes entire geographical areas (i.e., municipalities) Free Zones, and firms operating within their boundaries are eligible for the benefits upon approval by the Honduran Government. The law stipulates that only the government (under the National Port Authority) can administrate these zones. These FZs are not the typical fenced industrial park commonly associated with EPZs, but a collection of firms located within a municipality that operate under the legislative umbrella of this regime.

The FZ law gives export-oriented companies the usual benefits associated with EPZs like exception from import duties for equipment and raw materials, streamlined import procedures, income and other tax exemptions, freedom to manage foreign exchange, etc. (see Table 3). The exemption from income taxes never expires and manufacturing firms must export at least 95 percent of their annual production. Both the Ministries of Economy and Commerce must approve the sale of the potential five-percent in the local market.

Under RTA, firms may import intermediate inputs, equipment, machinery and their parts free of duties, but must post a bond with authorities (see Table 3). Originally these firms were exempt from income taxes for 10 years, but this benefit was eliminated in 1986. In addition, RTA firms have to follow normal procedures when importing and exporting inputs and products. Sales in the local Honduran market are not permitted.³⁹

The EPZ Law of 1987 opened the way for private development of zones in Honduras, the type of fenced industrial parks most commonly associated with the concept of EPZs. The benefits for firms operating under this regime are fundamentally the same as those granted under the FZ Law (see Table 3 and above for details), but the EPZ law provides additional fiscal benefits for the zone developer. These companies may import materials and all inputs free of duties as long as they are utilized in the development of the zone. In addition, developing companies are exempt from income taxes for 20 years. One specification of this law is that the developer has to guarantee that in five years the zone will generate at least 5,000 jobs.

³⁸ Since the EPZ and the FZ Laws give almost the same benefits for export-oriented firms, they are grouped under one heading in Table 3.

³⁹ However, sales to other export-oriented firms are allowed as long as these goods are incorporated in products exported outside the Central American region.

Development

The first export-processing zone in Honduras was established in Puerto Cortes in the early 1970s under the FZ Law.⁴⁰ The government established this first zone with the objective of improving the depressed economy of the northwestern region.

Until the passage of the Export Processing Law in 1987, no other zones were developed in Honduras. In 1988, the first privately developed EPZ was approved in La Lima, near San Pedro Sula, the second largest city in Honduras and the industrial capital of the nation. In 1989, two additional zones were inaugurated under this law, also located near San Pedro Sula. In the 1990s, EPZ activity boomed in Honduras. Between 1990 and 1993 about 10 additional EPZs were inaugurated. Overall, there are currently 14 EPZs in operation, and plans to build nine additional ones.⁴¹

In the late 1980s and throughout the 1990s, the Honduran government extended FZ status to several municipalities, most recently Tegucigalpa, Choloma, and Choluteca. Currently, more than 14 municipalities hold FZ status.

EPZs developed by private investors currently host about 95 firms that employ around 50,000 workers, whereas the 60 FZ firms throughout the country employ around 19,000 workers. In all, there are 159 firms employing more than 69,000 people operating under these two regimes (see Table 5 below). Unfortunately, there are no reliable firm or employment statistics for the Honduran RTA regime.

Nicaragua

Legislation

Nicaraguan Law provides two different regimes under which export-oriented activities may operate: 1) the Regime of Temporary Admission (RTA) and 2) the Export Processing Zone (EPZ) Law. Since the Nicaraguan RTA regime remains practically unused, we examine in detail only the EPZ Law.

EPZ firms enjoy the usual benefits of exemption from import duties on materials, machinery, and equipment, as well as on municipal and other taxes. They have total income tax exemption for 10 years, and 60 percent exemption thereafter, a permanent incentive. EPZ firms have free management of foreign exchange, and pay no withholding taxes on repatriated capital or profits. The Nicaraguan legislation distinguishes three different categories of EPZ firms. The categorization is based on the number of jobs created and the percentage of locally purchased inputs, and is used to determine the

⁴⁰ In order to differentiate firms that operate in industrial parks under the EPZ Law and those that operate independently in Free Zones, herein we will refer to them as EPZ and FZ firms respectively.

⁴¹ According to data provided by FIDE.

percentage of output that EPZ firms may sell in the local market. Finally, under current Nicaraguan law, firms outside industrial parks designated as EPZs may apply for EPZ status and benefits. These are the so-called “single factory” EPZs.

The law also provides fiscal and other incentives to EPZ developers. These firms have total exemption of import duties for all equipment, machinery, materials, tools and any other item needed for the development of the zone. Developers enjoy 15 years of income tax holiday, and total exemption from municipal, sales, real estate, and other taxes.

Development

The first EPZ in Nicaragua, Las Mercedes, was created in 1976. In 1979, after the Sandinista revolution, most of the firms in the zone left the country. The zone was then converted into a warehouse for the Sandinista army and into a prison. After the 1991 EPZ Law, the zone was transformed back into an industrial park for export-oriented activities. Currently, 15 companies operate in Las Mercedes and they employ more than 10,000 people.

Since the promulgation of the EPZ Law in 1991, the government has granted six concessions to develop private EPZs. Only one zone, however, has initiated operations, EPZ Index, and only one firm has established operations there. Moreover, only two firms located outside industrial parks have single factory EPZ status. In total, 18 firms with EPZ status in Nicaragua employ around 11,000 workers (see Table 6).

El Salvador

Legislation

In El Salvador, export-oriented industries may operate under the umbrella of the Export Processing (EPZ) and Fiscal Precinct (FP) Law enacted in 1990. The EPZ part of the law provides the legal framework for the establishment of industrial parks where export-oriented industries can locate their manufacturing operations. Its provisions are of the kind most commonly associated with EPZs. The FP dimension of the law provides a regime very similar to the RTA regimes in other nations.⁴²

The EPZ dimension of the law provides fiscal and other incentives to both users and developers of EPZs. Users enjoy exemption from income and other taxes for 10 years, exemption from import duties for materials, machinery and equipment used in their production process, simplified import/export procedures, free management of foreign exchange, and free repatriation of profits and capital (see Table 3). Income and other tax holidays are renewable upon request. Furthermore, firms operating under this regime may

⁴² To distinguish both regimes, we will refer to firms located in industrial complexes as EPZ firms, while to firms outside those as FP firms.

sell up to a maximum of 15 percent of their output in the domestic market, although textile and garment firms are excluded from this benefit. Developers enjoy income tax exemption for 15 years, municipal and other taxes for 10 years, and exemption from import duties in all materials, machinery, and equipment necessary to develop the zone.

Firms that operate under the law as Fiscal Precincts (FPs) have fundamentally the same fiscal incentives that EPZ firms enjoy, but can be located anywhere within the country (see Table 3 for more details). Other more important differences between these and EPZ firms are that local sales are not permitted for FP firms and these firms must follow normal import procedures.

Development

The first EPZ in El Salvador, the San Bartolo zone, was established by a special law in the early 1970s (World Bank, 1992). The Salvadoran government developed it, but is currently being privatized. Until the promulgation of the EPZ Law in 1990, no more EPZs were developed in El Salvador.

At the beginning of the 1990s, the first privately developed zone, El Progreso, was inaugurated in Santa Tecla not far from the capital San Salvador. Between 1992 and 1993 three more privately developed zones were inaugurated, San Marcos, Export Salva, and El Pedregal. The last EPZ established in El Salvador, American Park, began operations in 1996. There are currently six EPZs in El Salvador, all of them located within 40 km of the capital, San Salvador. These EPZs host 50 companies that employ 29,800 people.⁴³ Reliable, comprehensive information about the development of export-oriented firms outside industrial parks is not available.

Guatemala

Legislation

The Guatemalan legislation provides two different regimes under which export-oriented industries may operate: 1) the Export Activity and Maquila (EA&M) Promotion and Development Law; and 2) the Export Processing (EPZ) Law.⁴⁴ The Guatemalan government in 1989 approved both the EA&M and the EPZ Laws.

The EA&M Law (known as Decree 29-89) provides the legal framework and fiscal incentives for several categories of exporting enterprises. The law distinguishes five categories, but over 95 percent of the firms that obtained benefits under this law are

⁴³ According to data provided by the Ministry of Economy.

⁴⁴ The Guatemalan Congress also created The Santo Tomas de Castilla Free Zone in 1973. Export-oriented firms may locate and operate there, but today the zone is more an import-processing zone where many commercial enterprises operate than an EPZ. The zone currently has more than 30 firms, but only three are industrial enterprises with some level of exports. Following our definition of EPZs given in Section 2, this zone is not included in this analysis.

classified as either “maquiladora” or “export” firms operating under the RTA regime.⁴⁵ Thus, we concentrate our analysis on the provisions of the law for RTA firms.

The RTA part of the EA&M Law resembles in many ways the provisions of RTA regimes in other nations. These firms can be located anywhere within the country, but manufacturing enterprises are permitted to operate under this legislation. These firms enjoy exemption from import duties for equipment, machinery, and raw materials, as well as income tax exemption for 10 years. Interestingly, the income tax holiday is given only for the portion of sales outside the Central American region,⁴⁶ and local sales for firms operating under this regime are not limited (see Table 3).⁴⁷ Firms must follow normal import procedures into Guatemala, and do not have exemption from added value, or other taxes. These firms also have free management of foreign exchange and pay no withholding taxes for repatriated capital of profits.

The EPZ Law (known as Decree 65-89) provides the legal framework and incentives for both developers and users of EPZs. Developers are exempted from import duties on all equipment and raw materials needed for the construction and development of the industrial complex, and from income tax for 10 years and real state taxes for five years.

EPZ firms have to be located within the boundaries of an approved industrial area. They enjoy exemption of import duties for all equipment, machinery, raw materials and intermediate inputs needed in their production process (see Table 3). Industrial enterprises have 10 years of tax holiday, while commercial ones only have 5 years. Both types are exempted from added value and other taxes, and have streamlined import procedures at the EPZ location. Industrial EPZ firms may sell up to 20 percent of their output in the domestic Guatemalan market upon authorization and payment of the corresponding import duties. Finally, EPZ firms have free management of foreign exchange and are not subject to any withholding tax on repatriated profits or capital.

Development

After the promulgation of the EA&M Law in 1989 (Decree 29-89) many firms already operating in Guatemala applied for the benefits of the new law. In 1990, more than 190 firms received approval. In all, more than 660 firms have been granted one of the five statuses under the EA&M law, and about 590 of these are currently in operation (Ministerio de Economía de Guatemala, 1997). Unfortunately, employment figures for these firms are sketchy. A study of the firms operating under this regime in 1995, found that only 39 percent reported employment figures to the Guatemalan Institute of Social Security, as required by law (Ministerio de Economía de Guatemala, 1995).

⁴⁵ Survey of firms operating under the Regime, Ministerio de Economía de Guatemala (1995, p. 48).

⁴⁶ The Law requires these firms to have an account system such that profits from exports outside the region can be separately determined.

⁴⁷ Since the Guatemalan government does not keep statistics on the amount of local sales by these firms, on the aggregate their export-orientation is not known (Ministerio de Economía de Guatemala, 1995, p. 7).

On the other hand, the development of traditional EPZs in Guatemala has been very modest. Since the promulgation of the EPZ Law in 1989 (Decree 65-89), a total of 7 EPZ projects have been approved, but only 2 have attracted export-oriented firms. The first EPZ in Guatemala, and the only one in operation until very recently, began operations in 1991. This zone, developed by the same group that developed three zones in Costa Rica, is located in Amatitlan, some 30 kilometers from the capital Guatemala City. Currently the zone has just 8 companies that employ about 1,100 workers. The other zone with some level of activity is located in Tecun Uman, near the Guatemala-Mexico border. Only one firm, owned by the EPZ developers, operates there. In total, traditional EPZs in Guatemala have only 9 firms and employ about 1,400 workers.⁴⁸

Several factors contributed to the slow development of traditional EPZs in Guatemala. First, the EA&M Law (Decree 29-89) gives export-oriented firms similar benefits to those offered under the EPZ Law (Decree 65-89). Secondly, until very recently only one EPZ had been developed in Guatemala, resulting in a limited supply of factory space under this regime. Furthermore, the zone where this EPZ is located has been characterized by numerous and even violent labor conflicts that undoubtedly hindered its growth. There might be additional reasons for the slow development of EPZs in Guatemala, but the important fact is that export-oriented activity under the EA&M law is much larger.

7.2 Economic Significance

The lack of time-series statistics regarding investment, exports, employment and other economic variables as well as the very newness of many of the zones, constrains the ability to assess the economic importance of EPZs and other export-oriented regimes in Central America. There are also evident methodological problems in some governments' collection of these statistics. For example, net exports from export-oriented firms are registered as services in the Balance of Payments in most nations, even though IMF guidelines are clearly against that practice. Furthermore, some countries, such as Costa Rica, keep separate statistics for firms in EPZ or RTA regimes, while others, such as El Salvador and Guatemala, keep statistics for export-oriented textile firms only. Nonetheless, analysis of the economic significance of export-oriented activities that considers these limitations is reliable/possible and yields some strong conclusions. The analysis below begins with Costa Rica, Honduras, and Nicaragua, the countries for which more reliable and comprehensive data exist.

Costa Rica

Export-oriented activity in Costa Rica under the EPZ and RTA regimes increased rapidly since 1990, with more modest growth in the recent years (see Table 4). Between 1991 and 1996 employment increased more than 7 percent per year, while net EPZ and RTA exports increased more than 14 percent per year. The growth in activity has resulted in an

⁴⁸ According to the Ministry of Economy.

increasing share of export-oriented firms in manufacturing employment. In 1995, these firms accounted for 23.5 percent of manufacturing employment in the country, up from 16.3 percent in 1991.

The participation of export-oriented regimes in total exports of goods has also increased since the beginning of the 1990s. In 1996 net exports from both EPZ and RTA firms represented about 10 percent of total exports of goods, up from 7.9 percent in 1990.⁴⁹ Considering that Costa Rican exports of manufactured goods have been about 25 percent of total good exports (United Nations, 1996), exports from these regimes represented around 40 percent of all other exports of manufactured goods from Costa Rica in 1996.⁵⁰

Table 4
Economic Importance of EPZ and RTA Firms in Costa Rica
(employment in thousands, exports in US\$ millions)

	No. of Firms ⁽¹⁾	EPZ & RTA Employment ⁽²⁾	Manufacturing Employment ⁽³⁾	% of Total	EPZ and RTA Net Exports ⁽⁴⁾	Exports of Goods ⁽⁵⁾	% of Total
1990	NA	NA	183.0	NA	107	1346	7.9
1991	176	30.7	188.7	16.3	135	1490	9.0
1992	170	32.6	197.2	16.6	167	1729	9.7
1993	209	40.8	196.8	20.7	194	1874	10.3
1994	231	42.4	203.5	20.8	210	2122	9.9
1995	263	45.2	192.8	23.5	269	2570	10.5
1996	271	44.2	NA	NA	265	2676	9.9

Sources and Notes:

- (1) Own estimation using data from Diaz and Hines (1994), Procomer (1996), Gitli (forthcoming) and data provided by Procomer
(2) Own estimation using data from Procomer (1996) and Gitli (forthcoming)
(3) International Labor Office (1996)
(4) Data provided by Procomer
(5) Actualidad Economica (1997).

Honduras

Similarly to Costa Rica, activity in EPZs and FZs in Honduras expanded rapidly in the 1990s.⁵¹ Employment in these zones increased more than 40 percent per year between

⁴⁹ For the purpose of this paper, net exports represent the net generation of foreign exchange (i.e., total exports minus total imports).

⁵⁰ Exports from EPZ firms in Central America are registered as services in the Balance of Payments, and therefore not included in the figure of total exports of goods.

⁵¹ Since data for firms operating under the RTA regime in Honduras are not available, the indicators of economic significance that follow represent lower bound estimates of the economic weight of all export-oriented regimes in that country. According to data published by Torres (1997, p. 37), RTA firms employ about 18 percent of the workers that EPZ and FZ firms employ, a percentage that may give an indication of the degree of underestimation.

1990 and 1996, while net exports increased almost 57 percent between 1990 and 1995. In 1995, EPZs and FZs accounted for a very significant share, 36 percent, of manufacturing employment in Honduras (see Table 5). In 1995, net exports from these zones represented 24 percent of all Honduran exports of goods (see Table 5).

Table 5
Economic Importance of EPZ and FZ Firms in Honduras
 (Employment Figures in Thousands, Export Figures in US\$ millions)

	No. of Firms ⁽¹⁾	EPZ and FZ Employment ⁽²⁾	Manufacturing Employment ⁽³⁾	% of Total	EPZ and FZ Net Exports ⁽⁴⁾	Exports of Goods ⁽⁵⁾	% of Total
1990	24	9.0	78.6	11.5	30	887	3.3
1991	53	20.1	96.6	20.8	53	835	6.4
1992	72	27.2	111.9	24.3	106	833	12.7
1993	88	33.3	125.3	26.6	161	873	18.5
1994	114	42.5	139.1	30.6	194	940	20.7
1995	135	55.0	152.9	36.0	291	1190	24.5
1996	159	69.3	NA	NA	NA	1392	NA

Sources:

- (1) Own estimate using data from Banco Central de Honduras (1996), Torres (1997), and data provided by FIDE;
 (2) Torres (1997), Moncada (1995) and data provided by FIDE
 (3) Torres (1997)
 (4) Torres (1997)
 (5) Actualidad Economica (1997).

Table 6
Economic Importance of EPZ Firms in Nicaragua
 (Employment Figures in Thousands, Export Figures in US\$ million)

	No. of Firms ⁽¹⁾	EPZ Employment ⁽¹⁾	Manufacturing Employment ⁽²⁾	% of Total	EPZ Net Exports ⁽³⁾	Exports of Goods ⁽⁴⁾	% of Total
1990	NA	NA	45.4	NA	0	331	0.0
1991	NA	NA	36.8	NA	0	272	0.0
1992	8	1.0	33.4	3.0	3	223	1.3
1993	9	1.7	33.7	4.9	6	267	2.3
1994	14	4.6	31.9	14.5	12	351	3.4
1995	18	6.5	32.9	19.7	27	526	5.2
1996	18	11.3	NA	NA	53	671	7.9

Sources:

- (1) Data provided by Corporacion de Zonas Francas
 (2) International Labor Office (1996)
 (3) Gitli (forthcoming)
 (4) Actualidad Economica (1997).

Nicaragua

EPZ activity has grown rapidly in Nicaragua during the last few years. The number of EPZ firms more than doubled, while EPZ employment increased by more than eleven times between 1992 and 1996 (see Table 6). EPZ employment accounted for almost 20 percent of industrial employment in 1995, while net EPZ exports represented about 8 percent of total exports of goods in 1996. Considering that Nicaraguan manufactured exports are about 13 percent of total exports of goods, then EPZ exports in 1996 represented more than 60 percent of all other manufacturing exports from Nicaragua.

El Salvador

Unfortunately, the Salvadoran and Guatemalan governments do not have detailed and reliable time-series data on employment or exports for firms operating under their respective export-oriented regimes. To gauge approximately the economic significance of their export-oriented regimes, we examine data for export-oriented textile, known as maquila, firms.⁵²

According to these data (see Table 7), net exports from textile firms in El Salvador have increased more than 46 percent per year since 1990. In 1996 textile exports represented 20 percent of total exports of goods. Since Salvadoran manufacturing exports are about 45 percent of the total (United Nations, 1996), textile net exports in 1996 represented about 45 percent of all manufacturing exports from El Salvador. The scarce data available indicates that textile firms accounted for 28 percent of all manufacturing employment in 1996.

Table 7
Economic Importance of Maquila Firms in El Salvador
 (Employment Figures in Thousands, Export Figures in US\$ million)

	No. of Firms ⁽¹⁾	Maquila Employment ⁽¹⁾	Manufacturing Employment ⁽¹⁾	% of Total	Maquila Net Exports ⁽²⁾	Exports of Goods ⁽³⁾	% of Total
1990	NA	NA	NA	NA	22	582	3.8
1991	NA	NA	NA	NA	25	588	4.2
1992	NA	31.4	102.6	30.6	42	598	7.1
1993	NA	NA	NA	NA	70	742	9.5
1994	NA	NA	NA	NA	108	819	13.2
1995	NA	NA	NA	NA	174	1029	16.9
1996	190	38.4	135.2	28.4	214	1048	20.4

Sources:

(1) Gitli (forthcoming)

(2) Gitli (forthcoming) and Banco Central de Reserva (1997)

(3) Actualidad Economica (1997)

⁵² The implicit assumption here is that export-oriented textile, maquila, firms account for a high share of all export-oriented activity in these nations. As we will discuss later, this is justified by evidence that export-oriented activity in these two countries is highly specialized in the textile and garments sub-sectors.

Guatemala

Table 8 summarizes the available data on export-oriented textile firms in Guatemala. Net exports of textile firms increased an average of 30 percent per year between 1990 and 1996. In 1996 those exports represented 9 percent of total exports of goods. With 30 percent of Guatemalan exports of goods being manufactured (United Nations, 1996), textile firms represented about 30 percent of all manufacturing exports from Guatemala in 1996.

Table 8
Economic Importance of Maquila Firms in Guatemala
 (Employment Figures in Thousands, Export Figures in US\$ million)

	No. of Firms ⁽¹⁾	Maquila Employment ⁽¹⁾	Manufacturing Employment ⁽²⁾	% of Total	Maquila Net Exports ⁽³⁾	Exports of Goods ⁽⁴⁾	% of Total
1990	NA	NA	103.3	NA	39	1212	3.2
1991	NA	NA	118.8	NA	68	1230	5.6
1992	NA	NA	130.7	NA	96	1284	7.5
1993	NA	80.0	136.7	58.5	106	1363	7.7
1994	NA	70.0	152.8	45.8	136	1550	8.8
1995	NA	54.0	142.5	37.9	167	1989	8.4
1996	220	61.8	NA	NA	184	2031	9.0

Sources:

⁽¹⁾ Gitli (forthcoming)

⁽²⁾ International Labor Office (1996) and Gitli (forthcoming)

⁽³⁾ Gitli (forthcoming) and Banco Central de Guatemala (1995)

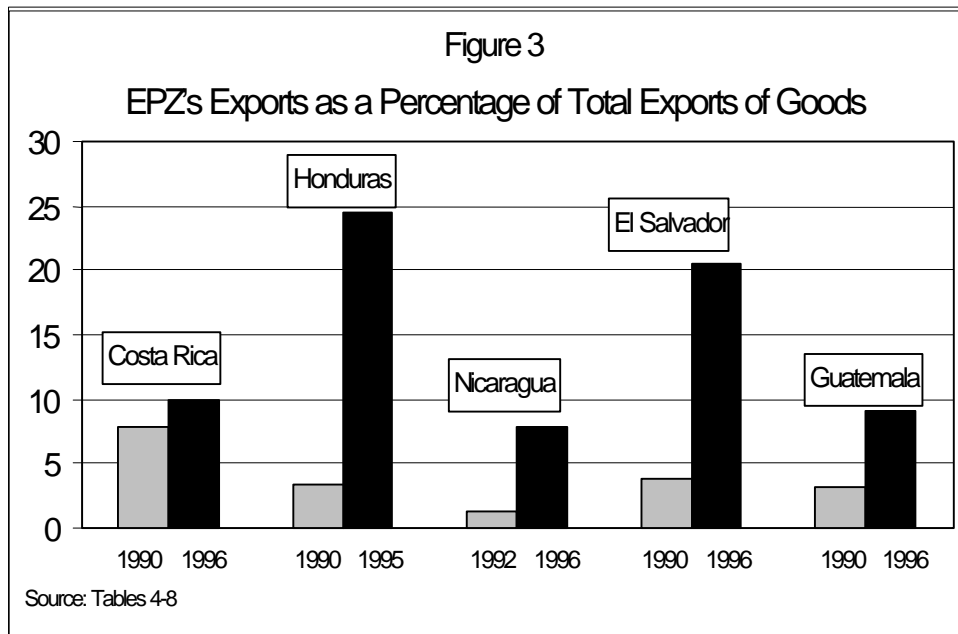
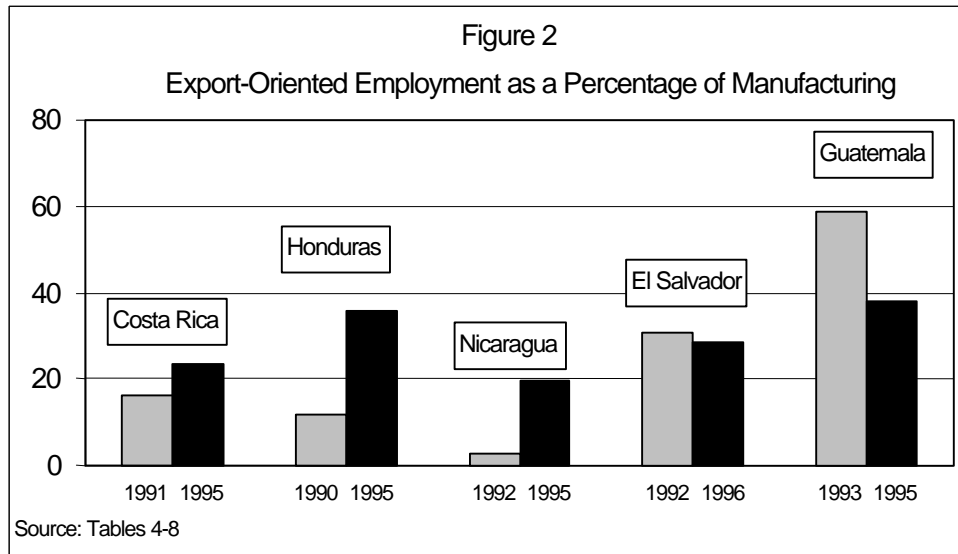
⁽⁴⁾ Actualidad Economica

Economic Significance

There are two notable conclusions from this data. First, the economic importance of EPZ activities increased rapidly in recent years. Figures 2 and 3 show how the share of export-oriented regimes in manufacturing employment and in total exports of goods has changed in Central America in the 1990s. Figure 2 demonstrates the significant growth of employment in manufacturing activities of the export-oriented regimes in Costa Rica, Honduras and Nicaragua. Figure 3 illustrates that exports from special regimes were among the most dynamic export sectors in all nations in the first half of the 1990s.

The second conclusion is that as a result of their rapid growth during the 1990s, export-oriented regimes currently account for a large share of both manufacturing employment and exports in the region. Their share in manufacturing employment varies from a low of almost 20 percent in Nicaragua to a high of more than 37 percent in Guatemala. Overall, these regimes have created more than 215,000 manufacturing jobs, and on average 3 of every 10 workers in manufacturing activities in Central America are employed by firms in export-oriented regimes. This is a large share considering that a UNCTC study (1985) finds the average for 19 countries to be about 2 percent, while an ILO/UNCTC (1988) study finds a similar average for 43 developing nations.

Export-oriented regimes account for export shares that vary from less than 8 percent in Nicaragua to a high of almost 25 percent in Honduras. Compared to other developing countries, these are relatively high shares.⁵³ In short, EPZs and similar export-oriented regimes in Central America have been one of the most important sources of manufacturing employment and among the most dynamic export sectors in the region's export-led growth strategy in recent years.



⁵³ For example, UNCTC (1985, p. 19) claims that this share is below 5 percent in most countries.

7.3 Industry and Ownership Distributions

One can construct industry and ownership distributions using several criteria, including the number of firms, employment figures, investment, value added, or the level of exports. For most of the five countries studied, the number of firms and employment figures are the only available statistics at the firm level. We thus use these two criteria to construct the distributions that appear in Tables 9-13.

Since data is not available for all export-oriented firms in all countries, we sometimes constructed industry and/or ownership distributions from data for a subset of all the firms. We assume that the subset constitutes a representative sample of the universe.⁵⁴ As a consequence, the number of firms or total employment figures in Panels A and B and Tables 4 through 8 may not coincide.

Costa Rica

In the region, Costa Rica has the most diversified export-oriented industries (see Table 9, Panel A). Nonetheless, as in all other Central American nations, textile firms represent the largest sector accounting for 37 percent of all firms and more than 62 percent of employment. The electronics industry is the second largest sector, accounting for about 15 percent of firms and employment. Many of these electronics firms are relatively new investments, with at least 20 of the 35 established in or after 1995. Machinery/Metal and Pharmaceutical/Medical products are the next largest sectors, accounting for 10.2 and 4.3 percent of firms and 3.9 and 2.6 percent of employment, respectively. The remaining shares correspond to a large variety of activities, including services, commercial activities, jewelry and footwear/leather products.

Panel B of Table 9 shows the nationality of the EPZ firms.⁵⁵ About 56 percent of firms in EPZs are U.S. subsidiaries, responsible for 84 percent of EPZ employment. Domestic Costa Rican firms account for 18.5 and 10 percent of firms and employment, respectively. Firms of Asian origin account for a small share of output and employment, less than 3 percent each.

⁵⁴ We do believe that is in fact the case, as we will argue later when we discuss each country's distributions.

⁵⁵ Since firm and employment figures according to nationality are available only for EPZ firms, we relied solely on those data to construct the distribution. There is some evidence indicating that this subset of firms is a representative sample of the entire universe. According to data published by Gitli (forthcoming), between 1993 and 1995 new investment in both EPZ and RTA regimes in Costa Rica was 51 percent US-owned, 13.7 percent Costa Rican, 13 percent European, and about 3 percent of Asian origin. These percentages are very similar to those reported in Panel B of Table 9.

Table 9
**Industry and Ownership Distribution of
 Export-oriented Firms in Costa Rica (1997)**

Panel A: Industry distribution of EPZ and RTA firms				
	No. of Firms	% of Total	Employment	% of Total
Textile	87	37.0	27615	62.7
Electronics	35	14.9	6832	15.5
Footwear/Leather	9	3.8	636	1.4
Machinery/Metal	24	10.2	1731	3.9
Phar./Medical	10	4.3	1163	2.6
Other Manufacturing	44	18.7	4927	11.2
Services & Commercial	26	11.1	1134	2.6
Total	235	100.0	44038	100.0

Panel B: Ownership distribution of EPZ firms				
	No. of Firms	% of Total	Employment	% of Total
U.S.	84	55.6	20324	83.9
Costa Rica	28	18.5	2370	9.8
Europe	12	7.9	360	1.5
Korea	3	2.0	421	1.7
Taiwan	1	0.7	23	0.1
Other	23	15.2	733	3.0
Total	151	100.0	24231	100.0

Source: Own estimation with data provided by Procomer and data from Cenpro (1996b)

Honduras

In Honduras, EPZ and FZ activity is highly concentrated in the textile industry.⁵⁶ Almost 94 percent of the firms, employing more than 98 percent of the work force in EPZs and FZs, are in the textile/garments sub-sectors (see Table 10, Panel A). The other six percent of the firms (less than two percent of workers) are distributed in plastics, commercial, machinery/metal products, and electronics.

Fifty percent of Honduran firms are subsidiaries of U.S. companies and constitute 57 percent of EPZ employment. This group accounts for a smaller share of firms and employment than in Costa Rica, but is still the dominant nationality (see Table 10, Panel B). The second largest group is Asian firms, many of which are Korean. They account for 29 percent of the firms and employment. Local Honduran companies represent just over 10 percent of the firms and 6.3 percent of employment.

⁵⁶ Just as in the previous section, information about firms operating under the Honduran RTA regime is not available.

Table 10
**Industry and Ownership Distribution of
 Export-oriented Firms in Honduras (1997)**

Panel A: Industry distribution of EPZ and FZ firms				
	No. of Firms	% of Total	Employment	% of Total
Textile	131	93.6	67793	98.2
Electronics	1	0.7	750	1.1
Machinery/Metal	1	0.7	15	0.0
Commercial	1	0.7	11	0.0
Other	6	4.3	462	0.7
Total	140	100.0	69031	100.0

Panel B: Ownership distribution of EPZ and FZ firms				
	No. of Firms	% of Total	Employment	% of Total
U.S.	70	50.0	39509	57.2
Honduras	15	10.7	4350	6.3
Korea	26	18.6	12892	18.7
Taiwan	9	6.4	3331	4.8
Hong Kong	6	4.3	3530	5.1
Other	14	10.0	5419	7.9
Total	140	100.0	69031	100.0

Note: Own estimation using data provided by FIDE

Nicaragua

In Nicaragua, as in Honduras, EPZ activity is highly concentrated in the textile industry (see Table 11, Panel A), accounting for over 94 percent of the firms and more than 98 percent of employment. At 31 percent, the U.S. presence is clearly smaller than in Costa Rica and Honduras, while Korean and Taiwanese firms account for a relatively high share of activity, almost 45 percent of firms and over 64 percent of employment.

El Salvador

In El Salvador, as shown in Table 12 Panel A, export-oriented activity in EPZs is also concentrated in the textile industry, although to a lesser degree than in Honduras and Nicaragua. Reliable data for FP firms were not available, and those firms are not included in the figures. Textile firms account for 80 percent of total and nearly 89 percent of employment in Salvadoran EPZs. The second most important sector is Footwear/Leather, which accounts for two and six percent of firms and employment, respectively. Electronic firms have a very small share of total activity. The "other" category consists of firms dedicated to toy repair and fabrication of jewel cases, plastic items and paper products.

Of the Salvadoran EPZ firms, 31 percent are U.S. owned and generate 41 percent of EPZ employment (see Table 12 Panel B). The second largest group is Korean, constituting 33 percent of firms and 35 percent of employment. Firms of Asian origin

account for a relatively high share of EPZ activity, 45 and 44 percent of firms and employment, respectively.

Table 11
**Industry and Ownership Distribution of
 Export-oriented Firms in Nicaragua (1997)**

Panel A: Industry distribution of EPZ firms				
	No. of Firms	% of Total	Employment	% of Total
Textile	17	94.4	11107	98.6
Footwear/Leather	1	5.6	158	1.4
Total	18	100.0	11265	100.0

Panel B: Ownership distribution of EPZ firms				
	No. of Firms	% of Total	Employment	% of Total
U.S.	6	33.3	2683	23.8
Nicaragua	2	11.1	620	5.5
Korea	3	16.7	1656	14.7
Taiwan	5	27.8	5567	49.4
Other	2	11.1	739	6.6
Total	18	100.0	11265	100.0

Note: Own estimation using data provided by Corporacion de Zona Franca

Table 12
**Industry and Ownership Distribution of
 Export-oriented Firms in El Salvador (1997)**

Panel A: Industry distribution of EPZ firms				
	No. of Firms	% of Total	Employment	% of Total
Textile	40	80.0	26520	88.9
Electronics	1	2.0	363	1.2
Footwear/Leather	1	2.0	1785	6.0
Other	8	16.0	1169	3.9
Total	50	100.0	29837	100.0

Panel B: Ownership distribution of EPZ firms				
	No. of Firms	% of Total	Employment	% of Total
U.S.	15	30.6	12135	40.7
El Salvador	10	20.4	4091	13.7
Korea	16	32.7	10374	34.8
Taiwan	6	12.2	2642	8.9
Other	2	4.1	580	1.9
Total	49	100.0	29822	100.0

Note: Own estimation using data provided by the Ministry of Economy

Guatemala

Since in Guatemala, most export-oriented companies operate under the EA&M Law (see section 7.1), industry and ownership distributions ought to be constructed with data from this regime. This law does not, however, limit the amount of domestic sales, and the degree of export-orientation of EA&M firms is not known (see section 7.1 above). Thus, the use of this data to construct industry and ownership distributions may include firms that export just a small fraction of their output (i.e., firms that do not comply with the definition of an EPZ firm given in Section 2). Nor would comparison with other Central American distributions be entirely valid. Nevertheless, lacking other sources of information, we were compelled to use data from all manufacturing enterprises that function under the EA&M Law to construct the industry distribution that appears in Table 13 Panel A. For the ownership distribution we opted for a better alternative: data from export-oriented textile (maquila) firms published by Gitli (forthcoming).

The industry distribution of Table 13 Panel A shows that, as in all other Central American nations, the textile/garment sector accounts for the largest share of export-oriented activity in Guatemala, 56 percent of firms and 63 percent of employment.⁵⁷ Next in importance are Machinery/Metal Products, Plastics, Marine Products and Food items, each of which represent around 5 percent of the number of firms (between 2.1 and 4.3 percent of employment). Electronic industries account for a very small share of activity, no more than 0.6 percent.

Table 13 Panel B shows that 44 percent of export-oriented textile firms in Guatemala are Korean, 43 percent are locally owned, and just 9 percent are U.S. owned. The low share of U.S. investment in the Guatemalan export sector is distinctive in the Central American region.

⁵⁷ It is also important to mention that in 1995 textile firms accounted for more than 93 percent of total exports by all firms operating under the EA&M Law (Ministerio de Economía de Guatemala, 1995). This suggests that the other industrial sectors may be over-represented in Table 13 as a consequence of not being able to segregate solely export-oriented firms from this data set. In fact, based on that information, one can argue that export-oriented activity in Guatemala is highly specialized in the textile industry.

Table 13
**Industry and Ownership Distribution of
 Export-oriented Firms in Guatemala (1995/1996)**

Panel A: Industry distribution of E:A&M Manufacturing firms (No. of firms for 1996, employment for 1995)				
	No. of Firms	% of Total	Employment	% of Total
Textile	263	56.2	25829	62.8
Electronics	2	0.4	267	0.6
Footwear/Leather	11	2.4	303	0.7
Machinery/Metal	25	5.3	1369	3.3
Food	24	5.1	1030	2.5
Marine Products	25	5.3	1726	4.2
Other	118	25.2	10595	25.8
Total	468	100.0	41119	100.0

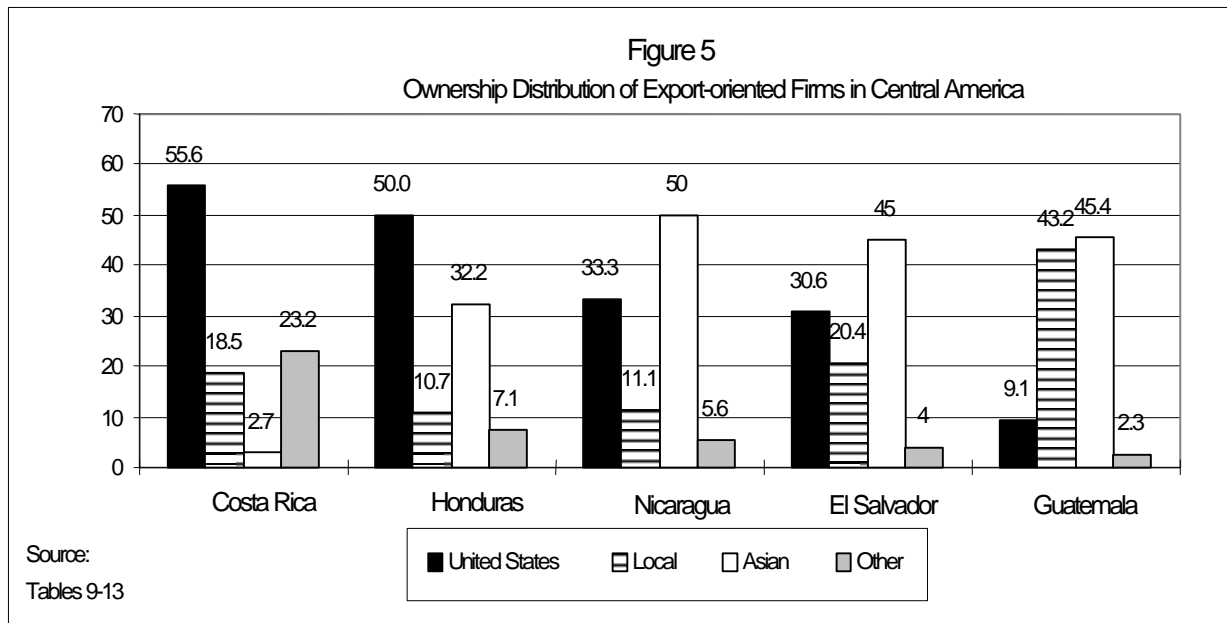
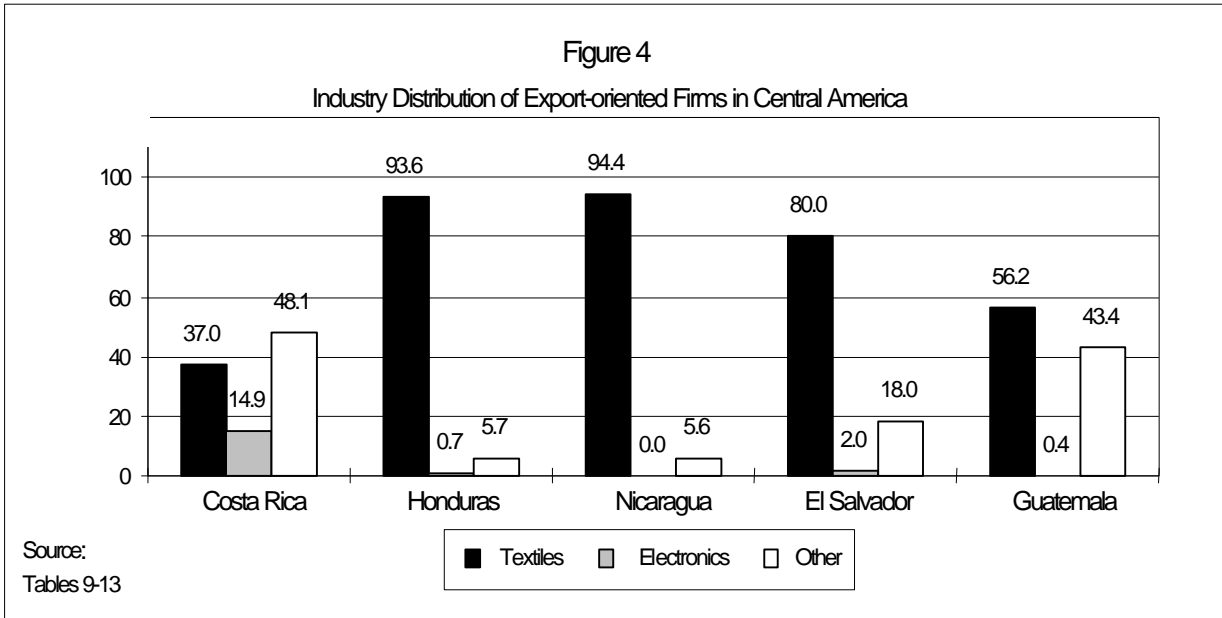
Panel B: Ownership distribution of maquila firms (1996)				
	No. of Firms	% of Total	Employment	% of Total
U.S.	20	9.1	NA	NA
Guatemala	95	43.2	NA	NA
Korea	96	43.6	NA	NA
Other	9	4.1	NA	NA
Total	220	100.0	NA	NA

Sources:

Own estimation using 1996 firm data provided by Ministerio de Economia, 1995 employment data from Ministerio de Economia de Guatemala (1995), and 1996 data published by Gitli forthcoming)

Regional Comparisons

To facilitate country comparisons, industry and ownership distributions according to number of firms are depicted in Figures 4 and 5 respectively. Figure 4 clearly shows that Costa Rica has attracted a wider diversity of industries to its export-oriented regimes. It is particularly interesting that Costa Rica is the only nation in the region to have attracted electronics firms to its export-oriented regimes. At the other extreme, export-oriented activity in Honduras and Nicaragua is almost completely specialized in textiles. The presence of textile firms is also large in El Salvador. Regarding ownership, Figure 5 reveals the relatively large presence of Asian investment in Nicaragua, Guatemala, and El Salvador, the small Asian presence in Costa Rica, and the small U.S. investment in Guatemala.



7.4 Real Wages and Labor Conditions

Real Wages

Time-series wage data is available only for Costa Rica's EPZ firms and Honduras' EPZ and FZ firms. Unfortunately, the other Central American nations do not have reliable statistics on wages paid by firms operating under any of their respective export-oriented regimes.

Table 14 contains an index of real wages paid by EPZ firms in Costa Rica, as well as an index of real wages paid in the industrial sector of the Costa Rican economy as a whole. As can be seen, real EPZ wages increased slightly between 1993 and 1996 (i.e., 5.2 percent over three years, or 1.7 percent per year). Unfortunately, it is difficult to compare how EPZ wages have behaved with respect to real wages in the industrial sector since the two series coincide for only three of the years shown.

Table 14 also contains an index of minimum real wages. Minimum real wages decreased significantly in 1994, a decline that actual real wages paid in EPZs and the rest of the industrial sector of the Costa Rican economy did not suffer. This suggests that real minimum wages are not a good surrogate for actual real wages paid in export-oriented regimes although many researchers have used them as if they were (e.g., Torres, 1997).⁵⁸

Table 14
Real Wages in Costa Rican EPZ Firms

	EPZ Real Wage Index ⁽¹⁾	Industrial Real Wage Index ⁽²⁾	Minimum Real Wage Index ⁽³⁾
1990	NA	99	86
1991	NA	93	84
1992	NA	96	90
1993	100	100	100
1994	99	110	84
1995	100	101	83
1996	105	NA	86

Sources :

⁽¹⁾ Own estimation based on Cenpro (1996a), Procomer (1997b) and CLACDS (1997a)

⁽²⁾ International Labor Office (1996)

⁽³⁾ Actualidad Economica (1997)

In Honduras, the rapid growth in EPZ and FZ activity has reduced the overall availability of workers, especially in the Sula Valley. As a consequence, real wages in export-oriented activities, most of which are located in the Sula Valley, have increased more than real wages in the industrial sector of the Honduran economy as a whole. Table

⁵⁸ Data for Honduras confirm this finding (see below).

15 contains a real wage index for EPZ and FZ firms and for the rest of the Honduran industrial sector. Between 1990 and 1995 real wages in EPZ and FZ firms increased at an average rate of 10.8 percent per year, while real wages in the rest of the Honduran industrial sector grew on average just 0.14 percent per year. Table 15 also contains an index of industrial minimum real wages. As seen, real minimum industrial wages in Honduras have decreased continuously since 1990, a pattern not followed by either actual real EPZ/FZ wages or industrial wages.

Table 15
Real Wages in Honduran EPZ & FZ Firms

	EPZ's Average Monthly Wage ⁽¹⁾	Consumer Price Index ⁽²⁾	EPZ & FZ Real Wage Index	Industrial Real Wage Index ⁽³⁾	Minimum Real Wage Index ⁽⁴⁾
1990	287	100	100	100	100
1991	482	121	139	98	92
1992	630	129	170	113	92
1993	791	146	189	144	93
1994	847	188	157	109	80
1995	1149	239	168	101	74
1996	NA	300	NA	NA	73

Notes:

⁽¹⁾ In local currency estimated from Torres (1997) and Banco Central de Honduras (1996)

⁽²⁾ CLACDS (1997a) and Actualidad Economica (1997)

⁽³⁾ International Labor Office (1996)

⁽⁴⁾ Actualidad Economica (1997)

Labor Conditions

Labor conditions in export-oriented firms throughout the region vary greatly. At one extreme are companies with relatively high standards for their kinds of product, manufacturing operations and labor conditions. In general these firms tend to locate their operations in industrial parks and many of them are well known MNEs with internationally recognized brand names (e.g., Hanes, Levi's, Fruit of the Loom, Conair). Working conditions in these firms tend to be at least as good as, and generally better, those in other comparable manufacturing operations. Employees in these firms work in a clean, well-ventilated (or air-conditioned) environment, and have access to medical attention, subsidized meals and transportation.

At the other extreme we found firms whose main objective is to establish manufacturing operations at the lowest cost possible in Central America, often just to take advantage of textile quotas. In general, these firms are located outside industrial parks where rent costs tend to be lower.⁵⁹ Working conditions in these firms tend to be

⁵⁹ This does not imply that every firm outside an industrial park is from this second group. Many firms outside industrial parks offer excellent working conditions.

very different from those discussed above. Employees do not have access to medical attention, their workplace is not clean, nor well ventilated or even well illuminated, and working hours are often stretched to the limit. Violation of workers' rights and the domestic labor legislation is not uncommon.

A striking feature in all five countries is the high rate of personnel turnover in export-oriented firms. Most of these companies have turnover rates that range between 2-5 percent per month, but rates as high as 8 percent are frequent. Many firms are experimenting with new incentive mechanisms and systems of production to cut absenteeism and turnover.⁶⁰

7.5 Backward Linkages

Making an economic measurement of backward linkages generated by export-oriented firms in the local economy is not straightforward. One measure uses the percentage of raw materials purchased locally by these firms as a share of total raw materials used. This measure, however, ignores linkages such as rental, banking, medical, and engineering services. Another method uses the percentage of domestic expenditures in total output including wages paid, rental costs, purchases of locally procured raw materials and supplies, as well as other services. This may arguably give a better indication of the degree of integration of export-oriented firms in the host economy. Where data permits, we measure backward linkages using both indicators.

Figure 6 shows the percentage of local purchases as a share of total value of exports made by export-oriented firms in Central America according to available data. Data exist only for EPZ firms in some countries and only for export-oriented textile (i.e., maquila) firms in others. As the figure shows, during the last three years the share of domestic expenditures has been between 25-33 percent of total exports for all countries. Overall the share of domestic expenditures is relatively low when compared with similar zones in Asia,⁶¹ but similar to shares in other Latin American countries.⁶² The share of domestic expenditures has shown a tendency to increase slowly with time, echoing results of many FDI studies.⁶³

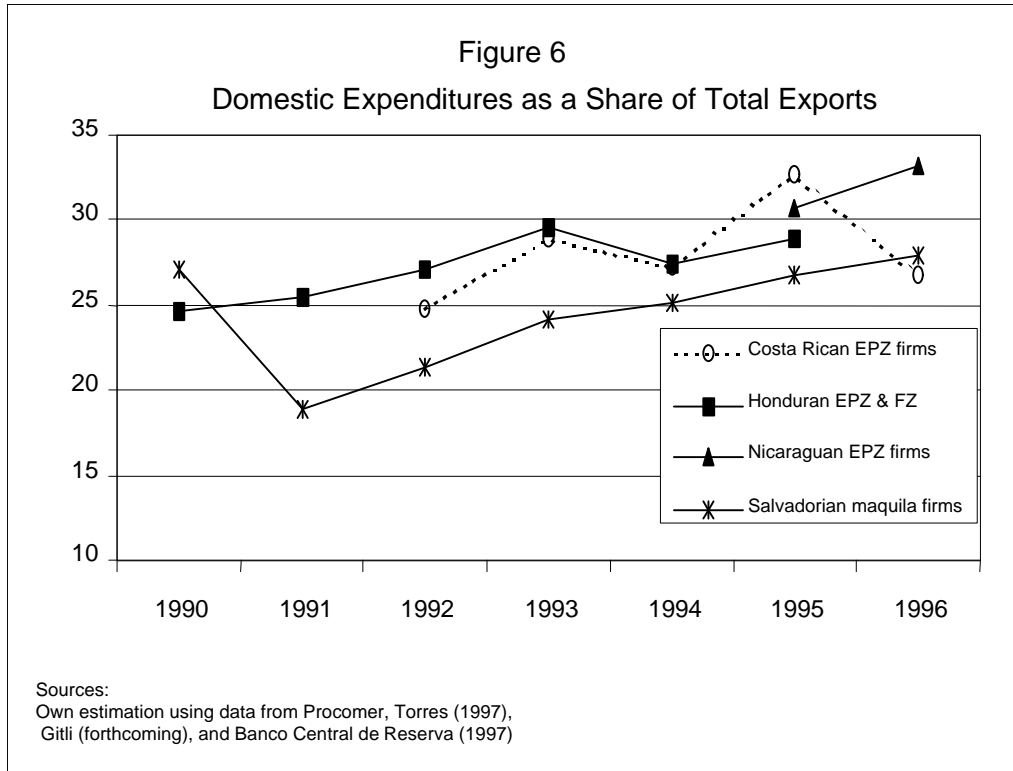
⁶⁰ For example, the so called 4x4 system, where employees work 12 hour shifts for four days and then rest for four days, has been introduced in several firms in Honduras. Also, in Honduras attendance bonuses are regularly offered. In Costa Rica attendance and other bonuses related to the number of years that the worker stays with the company are being offered.

⁶¹ For example, these shares were 52 percent in Korea and about 40 percent in India (Basile and Germidis, 1984).

⁶² For example, between 25-30 percent in the Dominican Republic (Kaplinisky, 1993), and about 25 percent in Mexico (according to numbers in UNCTC (1985)).

⁶³ For a summary of these studies see Caves (1996, pp. 232-233).

Wages constitute the bulk of the shares depicted in Figure 6, between 55-65 percent of total domestic expenditures.⁶⁴ Rent, utilities, and transportation services account for an additional 25-30 percent. Taken together these numbers suggest that backward linkages with domestic producers of raw materials are actually relatively low. Thus, we turn now to examine the share of domestically purchased raw materials in production.



Only a few data were available on the share of domestically purchased raw materials for production for Costa Rica, El Salvador and Guatemala, as shown in Table 16. In Costa Rica, the percentage of locally purchased inputs increased between 1993 and 1995, but decreased in 1996. In any year, the percentage of locally procured inputs is relatively small, which confirms the previous conclusion that few linkages exist between EPZ firms and local producers of intermediate goods used in production. Both the public and private sectors in Costa Rica have recognized this situation. There are now at least three initiatives aimed at increasing the share of locally purchased raw materials and supplies in export-oriented activities.⁶⁵

⁶⁴ See for example Torres (1997, p. 84)

⁶⁵ These are the so called Programa Mil sponsored by the Ministry of Science and Technology, the Subcontracting Program sponsored by the Costa Rican Chamber of Industries, and the PROFOVE program sponsored by the Ministry of Foreign Trade.

Table 16
**Share of Domestic Raw Materials
 and Supplies in Total**

	Costa Rican EPZ Firms ⁽¹⁾	Guatemalan Maquila Firms ⁽²⁾	Salvadorian Maquila Firms ⁽²⁾
1993	4.8%	NA	NA
1994	6.7%	6.9%	NA
1995	7.3%	8.4%	3.8%
1996	5.1%	3.5%	5.7%

Sources:

⁽¹⁾ From data in Cenpro (1996a) and Procomer (1997b)

⁽²⁾ Gitli (forthcoming)

In Guatemala, the share of domestic inputs in production increased in 1995, but decreased sharply in 1996, a decline that is difficult to explain and casts some doubts on the accuracy of the 1996 figure. In El Salvador, the share increased between 1995 and 1996, but the lack of data for more years limits analysis. The available data, however, indicates that in both countries the share of locally purchased raw materials in production is very small. In sum, the data available suggest that in Central American nations, as in other Latin American countries, relatively few linkages have been formed between export-oriented firms and the rest of the domestic economy, particularly with local suppliers of raw materials.

8. Policy Recommendations

The analysis in this paper has some important implications for policymakers. In particular, there are three distinct areas where Central American governments can improve their export-oriented regimes. These are: a) Diversification of industry composition; b) Development of linkages within the host economy; and c) Improvement and harmonization of export-oriented legislation.

Diversification of Industry Composition

Most nations in the region need to make a determined effort to diversify the industry composition of their export-oriented activity. In some Central American countries these activities are almost exclusively specialized in textiles, a sensitive sector for developed nations where the threat of trade barriers abroad is always present. Diversification into electronics and certain types of services (e.g. data processing) seems particularly desirable. Evidence suggests that electronic firms are less “footloose” and more likely to be the source of new technology and skills for the host economy than garment firms. Electronics has also been a more dynamic sector than garments in recent years. On the other hand, the increasing importance of international service industries like data processing, software production and back office support, offer an interesting opportunity for Central America.

In order to diversify the industry composition of export-oriented activity, Central American governments may need promotional programs targeted to specific industries. The Costa Rican effort is noteworthy in this regard. Costa Rican authorities targeted foreign firms in specific sub-sectors of the electronic industry that were considered willing to start operations in Central America. Several market studies and promotional campaigns were developed with the very specific objective of attracting those firms to Costa Rica.⁶⁶ The results have been impressive. Of the 35 export-oriented electronic firms currently operating in Costa Rica, 20 initiated operations after 1994. Similar programs and campaigns have been successfully implemented in other countries too. In the mid-1980s, Ireland targeted financial services and established a specialized EPZ for that purpose near Dublin. Today the zone employs thousands of people, most of them with university degrees (UNIDO, 1993). Jamaica, The Dominican Republic and India are also examples of nations that developed specific promotional programs for particular industries (i.e., data processing and electronics).

When targeting specific export-oriented activities it is important to recognize that different industries require different types of facilities. For relatively sophisticated electronic firms and pharmaceutical companies, a factory layout that includes a lower density of buildings with higher standards of landscape and appearance is necessary. In contrast, garment firms may require a higher density of buildings and lower appearance standards. For data processing, back office support and similar services, good international telecommunications are crucial. Thus, to diversify the industry composition of export-oriented regimes, Central American authorities should also consider the development of specialized zones, built specifically to accommodate certain types of industries and companies that the government chooses to target.

Pharmaceutical, electronic and some service industries require some skilled personnel, not abundant in much of Central America. Therefore, diversification of industries will also require the active participation of local universities and technical institutions to develop the skills that these industries will demand. The case of Intel in Costa Rica is particularly revealing of the kind of collaboration needed from educational institutions to attract more technologically advanced companies to export-oriented regimes.⁶⁷

Development of Backward Linkages

Central American governments need to direct their attention to the development of stronger backward linkages between export-oriented firms and the rest of their local economies. These linkages have remained relatively weak in the region. Empirical observation and theoretical developments show that strong linkages may be a significant source of benefits for the host economy. Export-oriented firms cannot be held responsible

⁶⁶ The Costa Rican Investment and Trade Development Board (CINDE) financed most of those studies.

⁶⁷ Several universities and technical institutions signed agreements to assure Intel that workers with the proper skills would be available when the \$500 million plant the company is building in Costa Rica starts operations in 1998.

for not developing backward linkages. This is not their *raison d'etre*. Experience has demonstrated that linkages do not arise automatically and that appropriate government policies are required to create them.⁶⁸

Several countries have so far been able to successfully promote the formation of linkages, most notably Korea, Taiwan and Ireland. Programs to foster linkages in these countries have three elements in common. First, at some point in the development of export-oriented activity, the local authorities established a clear and explicit objective of integrating export-oriented firms into their respective economies. They regarded these regimes as an integral part of their export-led strategy. Unfortunately, this has not often been the case in many host nations. The need to create linkages within the host economy has been in many ways relegated as an issue of secondary importance by local authorities.⁶⁹

EPZs and other export-oriented regimes in Central America have been seen mostly as mechanisms to create employment and generate foreign exchange, but not as drivers of an export-led growth strategy. Consequently, the creation of linkages has not been a priority in the policy agenda in most of the region. Therefore, governments in the region need to make the creation of linkages a priority, as a first step, and to think about export-oriented regimes as drivers of an export-led growth strategy, not as mere sources of unskilled employment, generators of foreign exchange, or instruments for regional development.

This view of the role of export regimes has an important implication for the location of export-oriented activity. EPZs and firms in similar regimes should not be encouraged to locate in rural areas, for example, to promote regional development. Even if some firms are attracted to such locations, linkages will be much harder to develop because of the lack of vocational, technical and managerial skills. The lack of an industrial base will also make the development of local suppliers much more difficult.

A second common element that fostered linkages in Taiwan, Korea and Ireland is that the authorities of all these countries were especially efficient in granting potential local producers of intermediate goods quick access to inputs at competitive prices. In Taiwan, for example, domestic producers got a tax rebate for taxes paid on inputs that went into products eventually sold to EPZ firms. In practice, the rebate was given to EPZ firms directly, which had the alternative to endorse it to the local producer. Potential

⁶⁸ For example, Keesing (1990) argues that countries need to develop what he calls "superior policies" in order to bolster backward linkages. McAleese and McDonald (1978) argue that governmental intervention is often helpful and sometimes even essential in creating linkages. UNIDO (1993, p. 7) argues that linkages "...do not take place automatically; they must be planned and encouraged with appropriate policies, institutions and regulations."

⁶⁹ For example ILO/UNCTC (1988) argues that in many cases the incentives in place for the local authorities make them "a rather inadequate instrument for promoting technological development per se, or even for fostering linkages...." UNIDO (1993, p. 10) states that "Backward linkages and technology transfer are often neglected."

producers were identified in advance and both the EPZ firm and the local producers were co-responsible for the proper use of the tax rebates. In Korea, an efficient “drawback” system was instituted in which indirect exporters (i.e., those providing inputs to export-oriented firms) were able to recover duties paid on materials and other items embedded in the products sold to EPZ firms. Irish producers of intermediate goods also had duty-free access to inputs if their products were eventually incorporated into exports. Central American firms need the same access to inputs that their Taiwanese, Korean and Irish counterparts received in order to become suppliers of export-oriented firms. To give Central American producers access to inputs in competitive conditions, we propose a modification of the Regime of Temporary Admission (RTA), plus a rebate system like that used in Taiwan for firms that do not qualify for RTA status.⁷⁰ The drawback scheme is less recommended given the difficulty and cost of administering such a system and the lack of confidence of domestic investors in getting paid back for duties and taxes.

The third and final common element that helped foster linkages in Taiwan, Korea and Ireland is the role that local authorities played in promoting personnel exchanges, supporting training efforts, and providing technical assistance to potential suppliers. For example, the Irish program to increase linkages included the active participation of technical departments of local universities. The program also encouraged purchasing managers of export-oriented firms to work with local suppliers (sometimes for long periods) to help them achieve the quality standards and delivery times required. Moreover, the Irish program also had the particularity that the President of a local technological University was appointed as member of the Board of Directors of the Zone Authority, with the clear intention of raising the level of technology and research in the zone, and to assist in the development of local suppliers.

In Taiwan and Korea, the zone authorities provided technical assistance to potential EPZ suppliers, and they actively encouraged personnel exchanges between EPZs and domestic firms. It is worth mentioning that the most common reason given by export-oriented firms for not buying a larger proportion of their inputs in the host economy is that local products and services do not fulfill the quality standards and delivery times they demand. Central America is no exception. EPZ firms there have expressed that low quality and unreliable delivery prevent them from buying a larger portion of their inputs locally. It is clear then that a program to offer technical assistance and training for local producers of intermediate goods is required in Central America to foster backward linkages.

Upgrading Export-Oriented Legislation

It is important for Central American nations to upgrade and harmonize the legislation that supports their respective export-oriented regimes. Following are some of the most important aspects to consider:

⁷⁰ More on this in the next sub-section

- The Zone Authority: Given the importance, recent growth and relative size of export-oriented regimes in Central America, it is important for the governments in the region to have a strong and independent Zone Authority to manage, overlook, and monitor all export-oriented regimes in their respective economies. The only countries in the region that currently have such an agency are Costa Rica and Nicaragua (Procomer and Corporación de Zonas Francas, respectively). This should be a parastatal agency with a Board of Directors and General Manager of high qualifications. The agency should be responsible for managing the regimes, approving new applications, monitoring the activities of export-oriented firms, collecting statistical data on their activities, overseeing customs procedures, making sure that export-oriented firms comply with labor, environmental and other regulations, as well as promoting the formation of linkages with local suppliers.
- Types of Export-oriented Regimes: Export-oriented firms operate under between two and five regimes in most Central American nations. This causes confusion among potential investors and can be the source of unfair advantages in some cases. Therefore, the first step in upgrading the legislation is to reduce the number of available regimes to two in each nation. It is our belief that the traditional EPZ regime and the Regime of Temporary Admission (both of which already exist in most nations) are the two regimes that should be maintained and uniformed across the region. The main differences between the two regimes should be as follows. The EPZ regime would be primarily destined for manufacturing firms that export outside the Central American region. EPZ firms would enjoy income and other tax holidays, as well as the benefit of importing equipment duty free. The RTA regime would be for firms that export both within and outside the region, but would not have the benefit of tax holidays and/or the possibility of importing equipment duty free.⁷¹ RTA firms would be allowed to sell their products in the Central American region free of duties as long as those products are eventually incorporated into exports outside the region. In addition, RTA firms would be allowed to sell their products in the domestic market without any restriction upon the payment of the corresponding import duties (i.e., should pay duties for the full amount of the value of the finished product). The possibility of selling within the Central American region for EPZ firms would be limited, say up to 10 % of their total output (firms wanting to sell a higher proportion would have to apply for RTA status).
- Income Tax Holiday: Many developing countries offer 10 years of income tax holiday for export-oriented activities. This has been considered adequate in most circumstances (UNIDO, 1993). In Central America there is great disparity among nations regarding this benefit. In Honduras the tax holiday is permanent (i.e., an EPZ firm will never pay income taxes), while in Costa Rica commercial firms may enjoy it for a maximum of 6 years. In this regard, it is important for Central American countries to establish a uniform schedule of benefits under each regime to prevent

⁷¹ Of course, firms under both regimes would be able to import raw materials and supplies duty free.

harmful competition amongst them to attract foreign direct investment. We consider that a limited (5 to 10-year) and uniform income tax holiday is an adequate incentive. A permanent tax exemption reduces the possibilities of integration of export-oriented firms into the domestic economy in the long run. The legislation might extend the holiday based on objective reinvestment and/or domestic value added indicators. For example, the legislation may stipulate an additional 3 to 5 years of tax if domestic value added exceeds 40 percent of the value of exports and/or if the company reinvests 50 percent or more of their original investment before the original tax holiday expires. The latter incentive should be available only for firms whose original investment exceeds a certain minimum.⁷²

- Customs Administration: One of the most common complaints of firms participating in export-oriented regimes relates to customs administration. Since one of the most appreciated benefits of the regime has to do precisely with the streamlining of customs procedures and absence of red tape for import/export operations, the improvement of these procedures is critical for the long-run success of the regimes. Several countries have experimented with different organizational customs arrangements. In Taiwan and Korea the zone authority has a supervisory role over customs at the zone location. In Sri Lanka and the Philippines the zone authority has joint responsibility for customs procedures. The Dominican Republic created a special department under the regular customs administration to oversee customs operations at zone locations. We believe that the Zone Authority in each nation should be given full responsibility for the operation, control and management of the EPZ and RTA regimes, and consequently over customs. Thus, specially trained customs personnel for export-oriented operations should be put under the supervision of the Zone Authority and given the responsibility of monitoring customs procedures at export-oriented locations.
- Domestic Suppliers: As explained in the previous section, to foster backward linkages it is important to give potential suppliers of export-oriented firms access to inputs at competitive prices. This can be accomplished through the proposed modification of the RTA regime, plus the implementation of the system of tax rebates mentioned earlier (i.e., much like the system in Taiwan) for those firms that do not qualify for RTA status. Under this scheme, potential suppliers of export-oriented firms in different countries may be allowed to qualify as of local origin even if they sell their intermediate inputs to a firm in a different Central American nation. This will strengthen backward linkages throughout the region. This is an important point at this stage of development of export-oriented activity in Central America because of economies of scale in the production of intermediate goods, and because there are several companies (mostly textile firms) that currently have operations in more than one Central American nation.

⁷² At the time of this writing, pending legislation in Costa Rica establishes a minimum of \$10 million.

- Free Zones and “Single” Factory EPZs: The current export-oriented legislation in some Central American nations (i.e., Honduras) allows the designation of a particular area or municipality as a special zone in which export-oriented firms may obtain various types of benefits. In other countries (i.e., Costa Rica, El Salvador and Guatemala) export-oriented firms may locate anywhere in the country and still be eligible for EPZ or RTA status and benefits. This legislation creates numerous problems to the authorities in charge of managing the different regimes. For example, it makes preventing the smuggling of products, inputs and/or equipment into the domestic economy very difficult. As a result of the lack of control, these firms are often the ones that violate labor, environmental and other regulations, and give a bad reputation to all export-oriented firms in the country. Thus, the legislation that supports export-oriented regimes in Central America should be modified to preclude the designation of regions and/or municipalities that do not contemplate the development of a well-designed and managed industrial park as beneficiaries of export-oriented legislation. In addition, “single” factory EPZs should be authorized only in very special cases (i.e., when the size, technology, or other particularity of the project justifies it, but never for unsophisticated, low-skill assembly operations).

To conclude, one final warning is in order here. The establishment of EPZs and similar export-oriented regimes should not serve to retard other economy wide reforms in Central America. These nations cannot expect to attract foreign investment and become engines of industrialization and growth if adequate economic conditions are absent. In particular, experience has demonstrated that countries that have accompanied the establishment of especial export-oriented regimes (e.g., EPZs) with economic policies consistent with outward orientation, have benefited more from the operation of these regimes than countries that kept an inward mentality in the rest of their economies.

9. Summary and Conclusions

EPZs are becoming increasingly popular throughout the developing world. Nowadays more than 50 nations have established about 200 EPZs. Their proliferation can be attributed in part to increasing levels of offshore manufacturing by multinational enterprises that find in the zones an ideal place to locate their overseas operations. EPZs are fundamentally concentrated in East Asia and Latin America, which account for nearly 90 percent of EPZ employment worldwide.

EPZs in Asia are larger and more widespread than those in Latin America. However, Asian EPZs account for a smaller share of manufacturing employment and exports than their Latin American counterparts. On the other side, Asian governments have been successful in promoting linkages between EPZ firms and the rest of the domestic economy, while in Latin America these linkages have remained very small.

A striking feature of EPZs around the world is that they always seem to be specialized in either textile/garments or electric/electronic industries. Whether a particular country's EPZs become specialized in textiles or electronics seems to be related to the degree of industrial development of the host nation.

From a theoretical perspective, EPZ models that have incorporated unemployment and intermediate inputs in production have shown that FDI in EPZs might improve the host nation's welfare under certain conditions. This is an important development in the theoretical analysis of EPZs since previous models had shown that FDI in a tariff-ridden economy was welfare reducing.

The empirical evaluations (i.e., Warr's cost/benefit analysis) show that the generation of employment is frequently the main source of benefit for the host economy. These studies have also shown that the benefit from selling intermediate inputs to EPZ firms varies greatly across countries, although in most cases it tends to be comparatively small.

Activity in EPZs and other export-oriented regimes has increased rapidly during most of the 1990s in Central America. EPZs and other similar regimes currently account for a large share of manufacturing employment and exports in the region. These shares are relatively high in comparison with other nations, thus revealing the economic significance that these regimes have achieved in Central America.

The development of export-oriented activities in Central America, however, has not been uniform across countries. There are numerous and striking differences in legislation and industry/ownership distributions. With regards to legislation, some countries in the region have a specific EPZ Law (e.g., Costa Rica and Honduras), while in others the EPZ regime is included in a Law that encompasses several other regimes (e.g., El Salvador). The number of export-oriented regimes available for potential investors and their specific characteristics also vary greatly from country to country. With respect to industry and ownership distributions, Guatemala represents a unique case in the region since U.S.-owned companies represent just a small fraction of the total. Costa Rica is also a special case since the share of electronic firms in EPZs is much larger there than in any other nation in the region.

The analysis in this paper has important policy implications. First, for most nations in the region it is important to make a determined effort to diversify the industry composition of export-oriented activity. In some Central American nations, EPZ industry is highly concentrated in the textile industry, a sector which is very sensitive to trade restrictions abroad. Diversification into electronics and some types of services (e.g., data processing) is particularly desirable and plausible since these activities are less "footloose," and they generate more backward linkages with the domestic economy.

Second, Central American governments need to encourage the development of more and stronger backward linkages between export-oriented firms and the rest of their local economies. The little data that we have been able to gather indicates that backward

linkages between EPZ firms and the rest of the domestic economies in Central America are growing, but are still relatively small. The experience in comparable developing nations demonstrates that these linkages do not develop automatically and that active government involvement is needed to form them. Central American authorities could follow the successful steps of several countries such as Ireland, Korea, Taiwan, and Malaysia. In particular, it seems that most potential suppliers in Central America require technical assistance and greater access to inputs and equipment through more favorable conditions (e.g., removal of import duties) in order to achieve the quality and price that export-oriented firms demand.

Third, Central American nations should upgrade their export-oriented legislation. We proposed to focus on the following six aspects: 1) Establish a Zone Authority in each country in the region to manage, overlook and monitor the export-oriented regimes; 2) Reduce the number of export-oriented regimes throughout the region. We propose to maintain and uniform the EPZ and the RTA regimes; 3) Establish a uniform schedule of benefits under each regime to prevent harmful competition amongst host countries, especially in regards to the income tax holiday. We propose a uniform 10-year income tax holiday, which may be extended based on reinvestment and/or domestic value added indicators; 4) Improve customs administration. We believe that the Zone Authority in each nation should be given full responsibility over custom procedures; 5) To foster backward linkages it is necessary that potential suppliers of export-oriented firms in different countries may be allowed to qualify as of local origin even if they sell their intermediate inputs to a firm in a different Central American nation; and 6) Modify export-oriented legislation to preclude the designation of regions and/or municipalities that do not contemplate the development of a well-designed and managed industrial park as beneficiaries of export-oriented legislation.

Finally, the establishment of EPZs and similar export-oriented regimes should not serve to retard other economy-wide reforms in Central America. These nations cannot expect these regimes to attract foreign investment and to become engines of industrialization and growth without adequate economic conditions. In particular, experience shows that those countries that accompanied the establishment of special export-oriented regimes (EPZs) with sound outward-oriented economic policies benefited more from the operation of these regimes than countries that kept an inward mentality in the rest of their economies.

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