ABSTRACT

The Impact of Export Processing Zones (EPZs)
on Labor in Latin America
With a Focus on Gender

by

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The report examines Latin American Export Processing Zones (EPZs) and focuses upon the impact of EPZs on the labor market, and particularly women. Countries covered in the report are Costa Rica, the Dominican Republic, and the Mexican maquiladora. The study found the literature in this subject area to be incomplete and weak. Nonetheless, it makes a few general observations.

The report finds that firms do not locate in EPZs because, in addition to tariff holidays, they can avoid the labor laws for the rest of the domestic economy -- labor laws within and without the EPZs are essentially identical. It also finds that firms legally do not locate in EPZs to avoid unions, although in the Dominican Republic accusations of (supra-legal) anti-union policies have been made, and could be an attraction. The report concludes that firms are attracted to Latin American EPZs principally because domestic wages are low by international standards, and the EPZ allows firms to avoid tariff and non-tariff import barriers, and, perhaps, to avoid unionization.

The literature surveyed endorses more infrastructure and services supports that would make it easier for women to work in EPZs. Unlike Asian EPZs, in the Dominican Republic, women are often married with dependents, and some firms prefer to employ women with dependents to achieve higher stability. In contrast, women in the Mexican EPZs are young, unmarried, and with few children. This difference may be due to the larger role that women in the Dominican Republic play in supporting families.

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THE IMPACT OF EXPORT PROCESSING ZONES(EPZs) ON LABOR IN LATIN AMERICA

- WITH A FOCUS ON GENDER -

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EXECUTIVE SUMMARY

This report examines Latin American Export Processing Zones (EPZs), and focuses upon the impact of EPZs on the labor market, and particularly women. This report reflects a thorough review of the available literature on Latin American EPZs (English, Spanish, French), finding the empirical base of general facts and micro-data to be very incomplete, and the conceptual/methodological foundations of existing studies to be conceptually weak. Nonetheless, a number of consistencies and worthwhile observations emerged.

In the first section we discuss the legal framework for EPZs and the legal facts concerning Latin American EPZs. First we discuss variants of EPZs and how EPZs relate to other forms of trade liberalization. Then we report on the laws governing EPZs in the Dominican Republic, Costa Rica and the Mexican maquiladora. One important question is whether firms locate in EPZs because in addition to tariff holidays, they also can avoid the labor laws for the rest of the domestic economy. The answer to this is: no. Labor laws in the countries reviewed are essentially identical in and outside of the EPZs. Another question is whether firms locate in EPZs to avoid unions. From the legal point of view the answer is also no. However, at least in the Dominican Republic, accusations of (supra-legal) anti-union policies have been made and could be an attraction. Informal information on union densities suggests that unions are virtually non-existent in Dominican EPZs while present outside; but more conclusive evidence on comparative wages, etc., is absent. In sum, it would appear that firms are attracted to Latin American EPZs principally because the domestic wages are low by international standards, and the EPZ allows firms to avoid tariff and non-tariff import barriers and, perhaps, to avoid unionization.

The appendices present tables summarizing the available data on labor market aspects of Latin American EPZs, compiled from a detailed search and many sources. Much is missing in available data: for example, virtually nothing was available on Costa Rican EPZs. From these tables three observations are noteworthy. First, EPZ employment grew at exponential rates throughout the region. Second, these growth rates departed from tiny levels and EPZ employment is still quite small for all but the Mexican maquiladora. Third, women represent a high percent of EPZ employment, but this depends on the industrial activity and tends to decline with time when EPZ activity shifts to heavier industries.

The second section of the report discusses the literature on EPZ labor markets, particularly with regard to female employment. Originally Costa Rica, the Dominican Republic and the Mexican maquiladora were to be reviewed; however, virtually no work is available on Costa Rican EPZs, so Costa Rica was dropped. Dominican EPZ employment is highly female, with Dominican economy-wide female participation very high (42 percent) and continuing to rise. Most women in Dominican EPZs are employed in light industries in semi-skilled jobs. Data on occupation mobility and skill acquisition is essentially non-existent, but the current absence of occupations into which they could move suggests little opportunity for mobility and skill acquisition. These women are not young compared to other countries, but are young in absolute terms. From anecdotal evidence, absenteeism stems principally from health causes. Occupations are de-facto segregated by sex and female wages seem to be roughly equal to the economy-wide minimum wage, or some small mark-up above it. There is little available information allowing comparison of wages inside and outside the EPZs for similar workers in similar industries and occupations. Reliable comparisons of wages by sex were not possible. Furthermore, the effect of the absence of unions in EPZs upon wages cannot be determined, for lack of adequate information. Unlike Asian EPZs, women are often married with dependents, or unmarried with dependents and the principal breadwinner. In fact, -- and again in contrast to Asian EPZs -- some firms express preference for women with dependents to achieve higher stability. A surprising result concerns schooling. Though most work is low-skill and learned quickly, some schooling (approximately eight years) is preferred by firms, rather than illiterate workers. The weak data does not allow further inferences on the important issues of female participation, occupational mobility, skill acquisition, age discrimination etc..

Employment in the Mexican maquiladora has grown rapidly and in relative terms. By 1987 employment in maquiladoras was fourteen percent of domestic manufacturing industries, in 1200 firms, and constituted four percent of GDP. Employment in these firms is dominated by production workers, with little change over time (averaging 85 percent production workers). Female maquila employment steadily declined from 79 percent in 1976

to 63 percent in 1988. This derives principally from a changing mix of industries, rather than changes of employment patterns within industries. Female employment in the maquila appears similar to female employment in the Dominican EPZ with regards to age, turnover, schooling, experience, training, hours worked and health status. The differences concern principally marital status and the number of children. Unlike the Dominican Republic -- but like Asian EPZs -- women in the maquila are principally young, unmarried and with few children. This difference may be due to differences in culture and family structure in which Dominican women have a larger role in supporting families than women in Mexico, although the available evidence does not allow us to clarify this. Much more detailed micro-economic and ethnographic studies would be required to satisfactorily examine these important issues of changing participation, and the impact of EPZs on the evolution of women and the family, and how this varies across countries.

The fourth section summarizes existing literature on policies related to female employment in EPZs. This literature is weak, and largely endorses particular infrastructure/service supports that would make it easier for women to work in EPZs. Casual evaluation suggests that the newness, geographic isolation and growth rates of EPZs (not maquilas) have led to inadequate services. These characteristics along with the cultural tradition of child-rearing burden falling on women, have caused the migration to EPZ areas to weaken extended family supports. Therefore, some efficiently delivered augmentation of key services would be welfare and efficiency enhancing (increasing female labor supply, lowering female absenteeism, and turnover, etc..).

The final section argues that studies funded have often sought answers to deep questions with shallow pockets: that more detailed additional studies generating better information are required to answer the key questions posed regarding EPZ employment and EPZ impact upon female employment. Some guidelines to the particular studies are presented.

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INTRODUCTION

The paper reviews the literature on export processing zones and labor markets in Latin America, with a focus upon the experience of women. Before discussing this in detail it is important to examine the overall context in which we should view the issues of EPZ labor markets.

EPZs are a specialized trade promotion tool to export labor and generate foreign exchange. Since government expenditures for development and running of EPZs are often limited, EPZs principally constitute a legal exemption attracting foreign investment leading to higher demand for labor, and only modest restructuring of the domestic economy. In this sense, the employment impact of EPZs may be at worst somewhat akin to the emergency job programs financed from outside the host country. Over the longer horizon, as EPZ employment becomes a large share of domestic employment, this employment impact may grow more complex.

While EPZ labor market issues are related to much discussed labor market issues associated with broader trade promotion and Structural Adjustment, they are different in some key respects. Today many economists and policy makers are calling for programs to augment the accumulation of human capital and thereby alleviate mis-matches in labor supply and demand that arise from trade promotion and Structural Adjustment. In Rudiger Dornbush's words:

> Trade-adjustment assistance and skill-building programs are the minimum that will be needed to reduce the losses borne by workers who are uprooted. If the FTA [free trade association] forces the Bush administration to adopt a substantial labour-market programme, it will be a doubly good thing, because it will have promoted trade liberalization both regionally and globally.[1]

EPZs constitute partial trade liberalization, or initial steps to trade. However, EPZ labor market issues are distinct from these broader trade promotion and Structural Adjustment because EPZs principally involve foreign investment. This external source of investment has typically led to only second-order changes in the level and structure of domestic demand for labor. Thus, EPZs generally have led to less severe structural reallocation of resources in the domestic economy and labor market than the broader reforms Dornbush is discussing. Though it is important to keep in mind the broader trade reforms of which EPZs can be a part, for these reasons our discussion of EPZ labor market studies will not attempt to address the labor market concerns associated with more extensive trade promotion and Structural Adjustment.

Issues concerning EPZ labor markets divide into two broad groups. The first group takes the EPZ as a given. Within this group we ask partial equilibrium questions, such as how to improve the efficiency and welfare outcomes of the EPZ labor market. More ambitious questions of a general equilibrium nature concern how EPZs change conditions and behavior of workers in and outside the EPZ. The second group of issues concern comparing EPZs to alternative policies, notably trade promotion policies.

Following the core of our assignment, and nearly all of the literature on EPZ labor markets, the focus here is on the first group of issues that take EPZs as given, and more narrowly upon the partial equilibrium questions concerning how to improve the efficiency and welfare outcomes of the EPZ labor market.

This report undertook to explore six key questions concerning EPZ labor markets. The first asked what the patterns of employment by sex and income in and outside the zones has been. The second asked what variation there is between countries in the proportion of women employed in EPZs -- compared to the proportion employed outside the zones in comparable industries -- and whether the patterns are changing. The third asked how wages and benefits of women inside the EPZs compare with those of men inside the EPZs; and, how wages and benefits of women inside the EPZs compare with those of women and men in comparable industries outside the EPZs. The fourth asked how the EPZ industries compare in their contributions to workers' skill acquisition. The fifth asked how EPZ employment affects the women's opportunities over the life cycle, and how that has changed over time. The sixth question asked how EPZ employment has affected the nutrition of EPZ workers and their children.

In retrospect, these questions are enormously overambitious. The current literature on the labor market consequences of export processing zones in Latin America is extremely limited. This assessment derives from an extensive literature search -- far more comprehensive than originally envisioned. Little information on EPZ labor markets -- much less on women in EPZs -- was found on any countries besides the Dominican Republic and the Mexican maquiladora. Yet even for these countries the literature was found sorely lacking in empirical data and serious methodological examination. Consequently, this report struggled to identify reliable conclusions concerning the questions of interest and related policy recommendations, while honestly identifying the profound limitations to the data and methodology. Consistency in the findings and recommendations of several studies did allow me to surmount the studies' individual limitations in several important instances.

The remainder of the report is organized as follows. Section I discusses the legal and regulatory framework of EPZs, generally and for three cases. It begins by briefly reviewing the export processing zone, and contrasting it to other programs of export promotion. That section then summarizes the legal and regulatory framework of the export processing zones in the Dominican Republic, Costa Rica and the related Mexican maquiladora. Section II summarizes the labor market literature for the Dominican Republic and Mexicc. Similar study of the Costa Rican EPZ labor market had to be abandoned after we discovered that virtually nothing is known about it, save for the total number of workers employed. Section III discusses the policy literature. After summarizing and evaluating the existing literature I add some further policy recommendations. Finally, Section IV discusses recommended studies. The shortcomings of the existing literature on the EPZ labor market render this task important and difficult. The list of issues is long and the existing literature fails to arrange these issues into clear conceptual categories. Rather than repeat this long and chaotic list, I organize these issues into conceptual groupings, as a preliminary step towards the elaboration of an integrated program of research. I end with recommendations and remarks concerning the actual empirical work needed.

At the report's end, an extensive bibliography is included, along with a statistical appendix presenting a complication of the key general information that is available on EPZs in Latin America, and more detailed tables for the Dominican Republic and Mexico. Article summaries were also provided, though these are for the convenience of AID and not to be quoted or referenced.

SECTION I: COMPARATIVE DEFINITION OF EXPORT PROCESSING ZONES, AND REVIEW OF THE LEGAL AND REGULATORY FRAMEWORK

We begin the legal and regulatory summary with a definition of export processing zones, in comparison with other trade promotion programs.

Definition of Export Promotion Regimes

In addition to unconstrained free trade, there are four methods of achieving free trade for export promotion[2]:

- free trade zones (also called export processing zones-EPZs)
- bonded manufacturing warehouses
- automatic import licenses and duty exemptions (also called temporary admission or temporary importation)
- automatic import licenses and duty drawbacks

These four methods may be viewed as intermediate steps towards achieving unconstrained free trade, or as compromise policies that embody many of the attributes of unconstrained free trade. Due to a variety of political, social and economic factors, few countries have been able to achieve unconstrained free trade without some of these intermediate programs.

All four of the alternatives to unconstrained free trade are potentially complementary policies that can represent preliminary steps towards more general trade liberalization. The choice of methods will depend on a variety of factors, including a country's capacity for exporting industrial goods when the export oriented strategies are introduced. For example, EPZs in Korea and Taiwan have played a much smaller role in export development than in most Central American and Caribbean countries because local entrepreneurs in Korea and Taiwan were better prepared to take advantage of free trade policies on a wider scale rather than depend on the smaller, more gradual results of EPZ programs. Most of the Caribbean and Central American countries lacked this more highly developed export capacity, and local industry was fearful of the effects that lower tariffs and other free trade policies would have on their ability to compete in or maintain markets. In countries like the Dominican Republic, EPZs have

provided a more politically acceptable way for the country to ease its way into free trade and attract foreign investors which have helped to upgrade the skills and abilities of local entrepreneurs.

Free trade zones, or EPZs, assure free trade within a physically delineated area[3] and can be publicly or privately owned and managed. The zones offer a range of incentives, services and infrastructure. These may include:

- Tax holidays, for a specific period of time or unlimited, covering a wide variety of corporate taxes
- Exoneration of import taxes on machinery and equipment, raw materials, inputs, packaging, etc.
- Exoneration of export taxes on finished products
- Freedom from exchange controls
- On-site customs inspection
- Infrastructure and basic services: standard factory buildings, electricity, water, trash, maintenance of green areas, security
- Specialty services offered by the zones: employment/recruitment, health services, transportation, food service, child care, etc..

In theory EPZs have extraterritorial legal status, but in practice this freedom is limited. For example, most EPZs in Latin America adhere to national labor laws. EPZs are generally oriented towards foreign investors, and companies locating in EPZs are required to export a majority of their production, if not 100 percent.

The three other alternative methods of export promotion -- bonded manufacturing warehouses, automatic import licenses and duty exemptions, and automatic import licenses and duty drawbacks -- provide incentives to export on a factory-by-factory basis, regardless of location. Under these schemes, import taxes on raw materials and intermediate goods are either temporarily suspended under bond or other forms of guarantee (maquila or temporary admissions), or paid and reimbursed to exporters upon export of the final product (duty drawback). Under the bonded manufacturing warehouse and duty exemption programs, raw materials and intermediate inputs are temporarily imported free of duty, under a bond or guarantee. When the final goods are exported the bond is cleared or canceled. The duty drawback program differs slightly in that duties are paid on imported goods and materials at the time of importation, but are reimbursed upon export of the final goods.

Another distinction between EPZs and the three other alternative schemes concerns access to the local market. Firms locating in EPZs are typically quite restricted in their ability to sell to the domestic market, while enjoying many benefits favoring exports. Thus, many or most firms locating in EPZs are entirely dedicated to exports. The three other alternative methods of export promotion, however, allow domestic firms to more gradually move towards exports, although materials imported duty free must be used exclusively for export.

Next we turn to the review of legal and regulatory aspects of export processing zones in the Dominican Republic, Costa Rica and the Mexican maquiladora.

Laws and Regulations Governing EPZ and Non-EPZ Exporters: Dominican Republic, Costa Rica and Mexico

This section discusses the laws and regulations governing EPZ and non-EPZ exporters in the three countries originally selected for case studies: the Dominican Republic, Costa Rica, and Mexico. The Dominican Republic has EPZs, bonded manufacturing warehouses[4] and duty exemption programs. Costa Rica has EPZs and duty exemption programs, while Mexico has bonded warehouses and duty exemption programs. In comparing the legal and regulatory frameworks for export promotion in the three countries, the following six areas will be covered:

1) Fiscal exemptions, including tax holidays and exemptions from payment of import and export duties
2) Customs procedures, particularly on site inspections and 24 hour service
3) Foreign exchange management, exchange rate regulation, and repatriation of profits
4) Sales to local market
5) Location
6) Labor policies including wages, hours and workweek, restrictions on hiring of foreigners, holidays and vacation, severance and termination clauses, social security, unionization and industrial safety

The next sections summarize policies in each country, emphasizing labor policies.

Dominican Republic

During the past 20 years there have been three primary changes in the trade laws and policies in the Dominican Republic. The first of these changes was the introduction of import substitution policies through the Industrial Incentives Law (Law 299) in 1968. This law provides incentives for EPZ firms (classification "A") as well as import substitution industries ("B" and "C"). However, EPZs now are covered by a new EPZ law. The second major change consisted of a transition to more outward looking trade policies through the passage of the Export Promotion Law (Law 69) in 1979. The current revision of the Tariff Code was the third of the changes. This revision would lower tariff rates to between 5 and 35 percent, although additional surcharges make effective rates of protection (ERP) higher. Some local economists estimate the new ERPs to be in the range of mid-30 to mid-60 percent.[5] The new tariff regime would eliminate most of the special tariff exemption programs that exist, although it is not expected that the EPZs or Law 69 programs will be affected.

Non Traditional Export Promotion Programs

Today there are two complementary programs for non traditional exporters in the Dominican Republic. In the first, the EPZs (or industrial free zones as they are known there), are governed by the Free Zone Law (Law 8-90). In the second, non-EPZ firms operate under the Export Promotion Law (Law 69-79). Law 69 originally considered programs for the temporary importation of raw materials and inputs as well as foreign exchange incentives, tax rebate certificates and incentives for the formation of trading companies. However, only the Temporary Admissions Program for the import of raw materials and inputs is in force today. The table below summarizes and compares the incentives and operational procedures of the two programs.

The major legal and regulatory differences between the EPZ versus the temporary admissions are as follows:

- Tax holiday and taxes on capital equipment: EPZs are exempt and non-EPZs are not exempt.
- Imports of raw materials and intermediate goods: EPZs import duty free while non-EPZ firms temporarily import duty free by securing a bond, which is canceled upon export of the final goods for which the materials were used.

- On site inspection by Customs: EPZs imports are taken directly to the factory in the zone and inspected there. Non-EPZ firms' shipments are inspected at the port and then delivered to the factory. This can lead to delays when the ports are congested and increases the opportunity for pilferage as goods are handled more often.
- Foreign exchange: EPZ firms are required to exchange only the amount of dollars needed to pay local costs of operation such as salaries, rent and utilities. In essence this gives them total freedom in repatriation of profits. Non-EPZ firms must exchange 100% of export earnings to local currency. Foreign investors outside the EPZs can repatriate 25% of registered capital, while local firms cannot repatriate any amount. In both cases the exchange is carried out at a specified rate at the Central Bank (or any other approved institution).
- Sales to the local market: EPZs are allowed to sell up to 20% of production on the local market, paying 90% of duties. Non-EPZ exporters have no restrictions on sales to the local market. However, if materials imported duty free under bond are used in products which are sold locally, they are liable for taxes on the materials.
- Labor laws: Both EPZ and non-EPZ firms are subject to the same labor code. EPZs, however, are exempt from profit sharing with employees. The labor laws are discussed in more detail in the following section.

TABLE 1
COMPARISON OF EPZ AND NON-EPZ EXPORT LAWS AND REGULATIONS IN THE DOMINICAN REPUBLIC

	EPZs	Temporary Admissions
Fiscal exemptions		
- tax holiday	100%	none
- imports capital goods	100%	none
- imports raw materials	100%	100% w/bond
- export taxes	100%	100%
Time limitations	8-20 yrs	unlimited
Customs		
- on site inspection	yes	no
Foreign exchange mgmt	local costs only	exchange 100%
Capital repatriation	unlimited	25% if foreign inv none for local inv
Sales to local market	up to 20%	unlimited/1
Location	EPZs	unrestricted
Labor (Both subject to same labor code)	- minimum wage	yes
- training wage	3mo.(6mo frontier)	
- hiring restrictions	30% foreign	same
- regular work day	8 hr day/44 hr week	same
- overtime	130%/68 hr; >69 hr/200%	same
- holidays	11; full pay	same
- vacation	2 weeks	same
- Christmas bonus	one month pay	same
- profit sharing	exempt	10%
- industrial safety	yes	same
- accidents	insurance required	same
- unions permitted	yes/2	same
- termination clauses	written notice required; sliding scale	EPZs must give 3 mo notice to CNZF
- severance pay	yes; sliding scale	same
- social security	yes	same
- maternity leave	12 weeks half pay;SS pays other half or employer pays full salary if no SS	

/1 An individual company may produce for both the local and export markets. Materials imported under the temporary admissions duty exemption must be re-exported within 12 months or they are subject to duties plus fines.
/2 However, formal complaints of restraint of unionization have been lodged.

Labor Law in the Dominican Republic

All industry in the Dominican Republic is governed by the same labor code, in spite of the "extraterritorial" nature of the EPZs. The EPZs are subject to the minimum hourly wage; employees working on a piecework basis receive no less than this minimum wage. EPZ firms are, however, allowed to pay lower wages during the 3 month training period, or for a 6 month period if in frontier areas. Workers laid off after the training period and later rehired by the same firm may not again be treated as apprentices. Employees work an 8 hour day and a 44 hour week, with overtime payments of 130% up to 68 hours and doubletime wages beyond that point. They receive full pay for 11 holidays, a 2 week vacation, and a full month's pay as Christmas bonus. At least 70% of workers must be Dominican.

Law 288 provides that all established companies must pay their permanent employees 10% of the annual profit before the determination of the net income taxable. EPZ firms, however, are exempt from this payment. The Labor Department establishes an minimum of safety standards that apply to all businesses and companies, which are also required to carry insurance for occupational accidents.

Unions and strikes are permitted by law both in and out of EPZs, and two types of unions exist in the Dominican Republic: corporation or trade unions. There are also "employer associations" which may consist of 3 or more corporations. However, an interagency committee headed by the Office of the U.S. Trade Representative has been mandated to review whether or not to remove the Dominican Republic from the Generalized System of Preferences (GSP--a preferential trade regime that allows duty free access for about 4,000 products) as a result of complaints regarding labor policy. Formal complaints have been filed alleging that Dominican workers in EPZs are being refused the right to organize and engage in collective bargaining.

Dominican labor law requires advance notification of termination, based on a sliding scale of the duration of employment: 3-6 months=6 days, 6-12 months=12 days, and more than 12 months=24 days. EPZ firms closing operations must give 3 months advance notice to the National Council of Free Zones. Severance pay is required for employees with more than 3 months of continuous service; this is also based on a sliding scale: 3-6 months=5 days, 6-11 months=10 days, more than 12 months=15 days, each additional year= 15 days.

All firms are required to make contributions to Social Security for employees earning up to a certain salary level. This covers medical care (general, special and surgery) after the first payment and financial aid to employees unable to work because of illness after the sixth payment. Maternity leave grants full pay for a 12 week period starting 6 weeks before birth. If the employee is insured through Social Security, the company pays only half; if exempt because she is making in excess of the established rate the employer must pay the total.

Changes in Export Promotion Laws and Regulations

The EPZ sector and the non-EPZ exporters have operated in quite different environments. The following section briefly discusses changes in policy and regulatory environments for these two sectors.

EPZs- Policies and regulations for the EPZ sector in the Dominican Republic have either remained stable or improved. Several changes have occurred in the legal and regulatory environment for the EPZs since the first company began its operations in 1969. The most important change has been the new Free Zone Law (2-90), which was passed in January of 1990. Before 1990, EPZ firms operated under the Industrial Incentives Law as class "A" firms. The main justification for the new law was to consolidate the various laws and regulations affecting EPZs, as they became an increasingly important sector of the Dominican economy. Important changes from the previous legal and regulatory framework include: incentives for the developers of EPZs, establishment of a sub-Directorate for EPZs within Customs to facilitate the increasing flow of paperwork generated by the EPZs, and a 12 month period for non EPZ exporters, meeting certain criteria, to reclassify as "special EPZs", receiving all EPZ incentives.

In the early years of EPZ development in the Dominican Republic, national firms were not given the same tax holidays as were foreign investors; they now receive equal benefit. Also, initially all EPZ firms, regardless of origin of capital were ineligible for local financing. Dominican firms are now able to obtain local financing.

An important change affecting the profitability of EPZ operations, and one which was in part responsible for the tremendous growth in EPZs in the latter half of the 1980's was a modification in the foreign exchange rate utilized by EPZ firms. Until 1985 the EPZs were subject to an artificially low rate of exchange. The subsequent adjustment to more realistic exchange rates spurred the growth of EPZs in the last half of the decade.

Another factor influencing the increase in the number of EPZs was the establishment of EPZs in the Santo Domingo metropolitan area; until 1984-85 EPZs had not been allowed in this area. The majority of new privately owned and managed EPZs have been in the Santo Domingo metropolitan area near major ports and airports, drawing on a better qualified labor pool in terms of technical, managerial, and administrative skills.

Non-EPZ Exporters- The non-EPZ exporters have been subject to a more unstable legal and regulatory environment than have the EPZs. The incentive law itself, Law 69, originally included foreign exchange incentives, tax credit certificates and incentives for the development of trading companies. The foreign exchange incentive was never applied, and the tax credit certificates and the incentives for trading companies were withdrawn after a few years. In addition, industries outside the EPZs have struggled much more with the inefficiencies of an unstable exchange rate, shortages of credit and the deterioration of infrastructure, including major problems with electricity.

Costa Rica

Since 1983 Costa Rica has made changes in economic policy geared towards the liberalization and development of a more efficient export sector. The government adopted several policy reforms including modification of the tariff and incentive structure, establishment of more realistic exchange rates and financial liberalization. The primary element of trade liberalization in Costa Rica has been the reduction of the level of effective protection. Costa Rica had been an observer of GATT since 1983, and in late 1990 became the 100th nation to join GATT. A new tariff regime became effective in early 1986 which eliminated all specific tariffs, included only ad valorem rates, implemented the Brussels Nomenclature Code and eliminated import surcharges related to the San Jose Protocol. All tariff rates in excess of the 40% maximum were reduced by 10% in October 1987 and an additional 10% in September 1988.[6]

In addition, export promotion efforts were enhanced by changes in free zone regulations, streamlining of procedures for non free zone exporters and modification of export incentives to include tax credits based on the FOB value of exports, income tax exemptions, duty free import of inputs and investment financing for export production.

Non Traditional Export Promotion Programs

There are three complementary programs for non traditional exporters in Costa Rica. The first deals with the EPZs, the second with temporary admission schemes, and the third with export contracts. The basic difference between the two non-EPZ programs is that the temporary admissions program allows for duty free importation of materials under bond or guarantee, while the export contract program gives exonerations proportionate to the percentage of a company's production dedicated to exports. Companies under the export contract program are also eligible for tax credit certificates. The table below summarizes and compares the incentives and operational procedures of the three programs.

TABLE 2
COMPARISON OF EPZ AND NON-EPZ EXPORT LAWS AND REGULATIONS IN COSTA RICA

	EPZs	Export Contract	Temporary Admission
Fiscal exemptions			
- local sales/excise	100%	proportional	none
- imports capital goods	100%	proportional	100%
- imports raw materials	100%	proportional	100% w/bond
- export taxes	100%	100%	100%
- tax profit repatriation	100%	15% tax	15% tax
- capital repatriation	guar.	guar. >4 yrs	guar. >4 yrs -tax credit (CAT) - tax
credits	no	15-20% FOB	no
Time limitations	10 yrs/renew; expire 96'	5 yr/renew	Customs
- on site inspection	yes	no	no
Foreign exchange mgmt	indep	Central Bank	Central Bank
Sales to local market	up to 49%	unlimited	not allowed
Location	EPZs	unrestricted	unrestricted
Eligibility	substantial transformation	35% VA	807/806.30 TSUS
Labor	(all governed by same Labor Code)		
- minimum wage	yes		
- training wage	3 months at 50% of minimum wage		
- hiring restrictions	10% foreign, representing <15% payroll		
- regular work day	8 hour day; 48 hour week		
- overtime	150%, not to exceed 12 hours		
- holidays	6 paid; 9 unpaid		
- vacation	2 weeks, after 50 continuous weeks		
- Christmas bonus	1/24 - 1/12 of annual income		
- unions permitted	yes		
- termination clauses	written notice required sliding scale		
- severance pay	yes; sliding scale		
- social security	yes		
- maternity leave	120 days: employer 50%/SocSec 50%		
- sick leave	50% first 4 days; 5th day SS 50%		

The following is a list of the major legal and regulatory differences between the EPZ and non-EPZ export incentive schemes:

- Import duties and taxes: EPZs and temporary admissions firms receive a 100% exemption, while export contract firms receive benefits proportional to export sales. Firms under export contracts, however, are eligible for a Tax Credit Certificate worth 15-20% of the FOB export value, renewable every two years. This has been a major incentive for firms to remain outside the EPZs.
- Taxes on profit repatriation and capital repatriation: EPZs are exempt from taxes on profit repatriation, and are guaranteed capital repatriation. Exporters under the other two schemes pay a 15% tax on repatriated profits, and capital repatriation is guaranteed only after 4 years.
- Customs procedures and foreign exchange management: The EPZs have on-site inspection of imported merchandise and independent management of foreign exchange. Firms under the other programs exchange foreign exchange through the Central Bank, and are subject to inspections at the port of entry -- although the Ministry of Trade claims that the procedures are streamlined through a central Customs House.
- Sales to the local market: EPZs are allowed to sell up to 49% of production on the local market, subject to governmental approval. Export contract firms have no restrictions on local sales, while goods imported under the temporary admissions scheme are not allowed to be introduced into the local economy.
- Time Limitations: EPZ incentives are valid for 10 years and temporary admissions incentives for five years. Both are renewable. The export contract program will expire in 1996.
- Labor laws: All industries in Costa Rica are governed by the same labor code, and no noticeable differences were found in the documents reviewed.

Labor Law in Costa Rica

All industry in Costa Rica is governed by the same labor code. All export industries are subject to the minimum hourly wage, and employees working on a piecework basis receive no less than this minimum wage. Employees work an 8 hour day and a 48 hour week, with overtime payments of 150% up to 12 hours maximum. They receive full pay for 6 obligatory holidays, 2 weeks vacation, and between 1/24 and 1/12 annual pay as Christmas bonus. Foreigners cannot account for more than 10% of the work force or 15% of annual payroll.

Unionization is allowed as are the Solidarista Associations. Minimum severance pay is made based on the following scale: 3-6 months=10 days, 6 months to one year=20 days, and more than one year=one month per year, not to exceed 8 months' pay.

The Costa Rican Social Security system covers health, indemnization and pensions. Employer contributions are mandatory. Maternity leave paid by the employer is 50 percent of salary for 120 days (30 days prior and 90 days after birth), with Social Security paying the other 50% during leave. Employers are also responsible for sick leave pay equal to 50% of salary for the first 4 days of illness, with Social Security continuing after the 5th day.

Changes in Costa Rican Export Promotion Laws and Regulations

Tax credits have been a key incentive for Costa Rican export promotion, and have reached 3% of the national budget. This has been one reason for the phasing-out of the export contract in 1996. There has been discussion about modifying the Free Zone Law to lengthen tax holidays, shorten approval times, and provide enhanced access to local markets. As in the case of the Dominican Republic, only in recent years have EPZs been allowed in the metropolitan San Jose area and several privately developed and managed zones are now in operation there. Regarding non-EPZ exporters, the major change will be the expiration of the export contracts in 1996.

Mexico

Mexico's process of internationalization in recent years has had two major components: 1) foreign trade liberalization, and 2) opening of the economy to foreign investment and transfers of technology. Further integration of the maquila industry is also a major goal. Trade liberalization began in 1984 and accelerated in 1986 when

Mexico joined the GATT. Mexico not only consolidated its trade regime under GATT, ahead of its agreed schedule, but has also reduced its tariffs from 100% in many cases to 20% maximum. The weighted average tariff fell from 16.4% in 1982 to 5.6% in 1989. Only 2.7% of all imports are subject to licenses.[7]

Much of U.S.-Mexico trade, however, was already taking place under preferential tariff agreements--the Generalized System of Preferences (GSP) and the TSUSA 806.3/807 Program. The average tariff is 12.5%, and some of the major areas of trade are still subject to quota restrictions -- electronic equipment, automotive products, steel and textiles

Over the past 2 years in particular, the Mexican government has made important changes so as to improve the environment for foreign investors. One major change regarding foreign investment now allows 100% foreign ownership in most sectors and up to 49% in areas formerly reserved exclusively for Mexican nationals. The approval process has also been streamlined through the implementation of "one-stop processing centers" located throughout the country. Although there have been no changes in the Labor Code, the government has worked to create more stable labor relations. The number of strikes fell 11% from 1988 to 1989 and the number of workers involved in strikes dropped by half[8].

Another important change affecting foreign investment and trade was the deregulation of the trucking industry. High inland transportation costs have plagued Mexico and the government reports that the cost of freight transportation has gone down by 15%, and may drop as far as 25%.[9]

The proposed Mexico/U.S./Canada free trade agreement also has significant implications for trade. Some experts have proposed that the free trade agreement needs two special provisions in order to more effectively deal with social adjustments in the labor market. These include a substantial phase-in period (10 years) for industries adversely affected, and a major commitment of resources to the retraining and skill building of displaced workers.[10]

Non Traditional Export Promotion Programs

Mexico has two programs- maquila and temporary import. Mexico's Border Industrialization Program (Maquila) began in 1966. The maquiladora or production sharing program established an early model for free trade, and was created to generate jobs and foreign exchange, as have the EPZs in other countries. Mexico has a second

program for nontraditional exporters known as the temporary import (PITEX) programs. The maquiladora program is the larger and better known program of the two.

There are currently more than 1,900 maquila factories in Mexico, employing about 466,000 workers[11]. According to 1989 statistics, nearly 80% were located along the 2,000 mile U.S.-Mexican border, primarily in industrial parks. In recent years more and more of the factories have begun to move inland. The table that follows summarizes the incentives and operational procedures of the two programs.

The differences between the maquila and temporary import programs are minimal and fall into two categories:

- Imports of capital goods and raw materials: Maquiladoras have no restrictions on imports of capital goods and raw materials as long as bonds or guarantees are posted. Firms operating under PITEX must export at least 30% of total sales to be eligible for capital goods imports, and US$1 million or 10% of total sales to be eligible for raw material, packaging and lubricant imports.
- Foreign exchange management: Although firms under both regimes are subject to the controlled exchange rate, maquiladoras are required to exchange only enough currency to cover local costs (a characteristic of the EPZs in the Dominican Republic and Costa Rica) while PITEX firms are required to exchange 100% of foreign exchange earned.
- Sales to local market: Under the recent reforms the limits on maquila sales to the local market was raised from 20% to 50%.

As the Mexican government continues to move towards liberalization of its economy and foreign trade policies the incentives of the Border Industrialization Program may become less important. Before the recent reforms, maquilas were the only sector in which 100% foreign ownership was allowed, and in which foreigners were authorized to own real estate (along the border zones only). The government has lifted restrictions limiting foreign ownership in both these areas. A further lowering of tariffs through a Mexico, U.S. and Canadian Free

Trade Agreement could make the maquila structure obsolete by extending maquila privileges and incentives countrywide.

One incentive that has remained in place is that maquiladoras and PITEX operations are exempt from the 10% limit on hiring of foreign personnel.

TABLE 3
COMPARISON OF LAWS AND REGULATIONS GOVERNING THE MAQUILADORA AND TEMPORARY IMPORT (PITEX) PROGRAMS IN MEXICO

	Maquiladora	Temp Import (PITEX)
Fiscal exemptions		
- tax holiday	subject to all taxes; tax rate 36% in 1990, 2% tax on net assets offset against income taxes payable, value added tax refunded upon request	
- imports capital goods	100%	100% with bond;restrictions
- imports raw materials	100%	100% with bond;restrictions
Time Limits	2 yr/renew	3 yr/renew
Customs		
- on site inspection	yes	?
Foreign exchange controls	controlled rate/ local expenses	controlled rate/ all proceeds
Sales to local market	50%	20-30%
Ownership	unrestricted	unrestricted
Location	unrestricted	unrestricted
Labor	(subject to same labor code)	
- minimum wage	yes	
- hiring restrictions	unrestricted	
- regular work day	8 hr day/48 hr week	
- overtime	200% up to 9 hrs; 300% if beyond	
- holidays	8 with full pay	
- vacation	six days after one year	
- Christmas bonus	not less than 15 days salary	
- profit sharing	10% unless new co/new product	
- industrial safety	yes	
- unions permitted	yes	
- termination clauses	written notice;no time period given	
- severance pay	3 months plus 20 days/year	
- social security	yes	
- education	1% educational tax	
- housing	5.22% housing tax to Natl Housing Fund	

Labor Law in Mexico

All industry in Mexico is governed by the same Federal Labor Law. The recent reforms have not affected the Labor Law itself, but the labor market has gone through adjustments. Each employee in Mexico has a work contract with the firm that employs him, whether that be individual (temporary or permanent) or collective. Industries under both programs are subject to the minimum hourly wage; employees working on a piecework basis receive no less than this minimum wage. Employees work an 8 hour day, and a 48 hour week, with overtime payments of 200% up to 9 hours and 300% thereafter. They receive full pay for 8 holidays, a six day vacation after one year, and a minimum of 15 days' salary as Christmas bonus. Maquilas and PITEX firms are exempt from the 10% restriction on the hiring of foreign workers.

A company is obligated by law to distribute 10% of its annual taxable profits to its employees. Companies in their first year of operation, or in first 2 years if engaged in a new product area for Mexico, are exempt from this requirement.

Unions and strikes are permitted, and are stronger along the Texas border than the California border. It is estimated that 10 to 20 percent of maquiladora workers are unionized, versus 90 percent of the non-maquila workers.[12] Unions' emphasize increasing membership, to gain power in Congress to improve working conditions through labor-related legislation. The law requires advance notification of termination, but no time table is set out. Severance pay is required for employees with more than 3 months of continuous service at the rate of 3 months plus 20 days for each year worked.

All individuals under labor contract must be registered with the Mexican Social Security Institute (IMSS). This registration relieves the employer from liability in connection with job related illnesses and accidents and provides benefits to the employee and dependents including: 1) medical and hospitalization insurance for illness, accident or maternity; 2) insurance for disability, old age and unemployment; 3) child care.

Changes in Mexican Export Promotion Laws and Regulations

In December of 1989 changes were made in the regulations of the maquila program in Mexico. The most important changes were the simplification of application and approval procedures, and an increase in the limits for sales to the local market from 20% to 50%. This increase in local sales is partially intended to better integrate the maquilas into the local economy. At the present time less than 2% of inputs are purchased in Mexico. Before this reform 100% foreign investment was prohibited in Mexico, other than in a maquiladora. In exchange for this privilege local sales had been limited to 20%. With the relaxing of foreign ownership rules, under the current administration, the maquilas have also been given increased access to the local market.

In recent years, there has been significant movement of maquila investment from the border areas towards the interior, to escape rising wages and high turnover. A free trade agreement or more favorable overall investment environment in Mexico will encourage that trend.[13]

Comparison of Laws and Regulations in the Dominican Republic, Costa Rica and Mexico

The Dominican Republic lags behind Costa Rica and Mexico in trade liberalization. Ironically, this may partly account for the country's tremendous success with EPZs. In general, EPZs in both the Dominican Republic and Costa Rica receive generous tax holidays and exemptions from taxes on imports of raw materials, intermediate goods, and capital goods. Firms operating under temporary importation-type schemes in all the countries except the Dominican Republic are allowed to import capital goods and materials in varying degrees, but are required to pay other local taxes. The maquila program in Mexico and the EPZ program in Costa Rica allow for up to 50% of production to be sold in the local market, compared to 20% for the DR.

There is more variation among the three countries in terms of labor regulations. The important variations in labor relations include:

- Hiring restrictions on foreigners - Mexico has the most liberal policy. They have no restrictions on hiring of foreign technicians and managers, while Costa Rica is quite limited at 10%. The Dominican Republic allows 30%.

- Work week - The Dominican Republic has a slightly shorter workweek- 44 hours versus 48 in Costa Rica and Mexico.
- Overtime - Mexico is the most generous (200% - 300%), followed by Costa Rica (150%- not to exceed 12 hours), and the Dominican Republic (130% - 200%).
- Holidays - the Dominican Republic has the highest number of paid holidays- nearly double that of Costa Rica (11), followed by Mexico (8) and Costa Rica (6).
- Unions - Unionization is formally permitted in all three countries. However, no unions exist in the Dominican Republic EPZs and there has been controversy over whether or not unionization has been restricted in the Dominican Republic. Unionization in Mexico is much lower in the maquilas than other industries and varies regionally.
- Profit sharing - EPZs in the Dominican Republic are exempt from the 10% profit sharing requirement of the rest of industry; maquilas in Mexico are not exempt from a similar 10% profit sharing obligation.
- Severance pay - Mexico offers the most generous severance pay for workers of less than 1 year, although Costa Rica's coverage is 50% higher for employees with greater than 1 year. The Dominican Republic has the least generous program, as seen below:

	Severance Pay		
	Dominican Republic	Costa Rica	Mexico
3-6 months	5 days	10 days	3 months
6 months-1 yr.	10 days	10 days	20 days
> 1 yr.	15 days/year	1 month/year	20 days/year

- Termination notice - All three countries require written notice of termination. Time limits under Dominican law are slightly less than in Costa Rica, but not

significantly (eg. 6 days vs. 1 week, 12 vs. 15 days and 24 days vs. one month). No time limits are established under Mexican Labor Law which would render the written condition of little value.

- Social security. Social Security in Mexico covers child care in addition to the standard medical and hospitalization (illness, accident, maternity). Disability, old age and unemployment offered by all three countries. However, the social security systems in at least the Dominican Republic and Mexico are very underfunded and weak.
- Maternity leave - leave in Costa Rica is 1.5 months longer than in the Dominican Republic, 90 days versus 12 weeks.
- Sick leave - under Costa Rican law employers pay 50% of wages for the first four days, and Social Security pays 50% after the 5th day. In the Dominican Republic sick leave is paid by Social Security.

While there is significant variation in labor law across countries, this variation is not enormous. Moreover, there is no simple a priori ranking of these countries in terms of the attractiveness of their labor laws to foreign investors. Next we discuss the literature on labor markets in the Dominican Republic, Costa Rica and Mexico.

SECTION II: THE DOMINICAN EPZ LABOR MARKET AND THE MEXICAN MAQUILADORA

There is little general literature on the Latin American EPZ labor market. The existing literature of merit is almost entirely concentrated on the Dominican Republic and the Mexican maquiladora. This section reviews the literature on EPZ labor markets for the Dominican Republic and the Mexican maquiladora, focusing on the impact on women. Similar study of the Costa Rican EPZ labor market had to be abandoned after we discovered that virtually nothing is known about it, save for the total number of workers employed.

For the Dominican Republic I begin by describing and assessing the relevant census and micro data that is available. Then, using this assessment of the data, I critically evaluate the existing literature on the Dominican EPZ labor market. The discussion of the literature on the Mexican maquiladora is organized in parallel fashion. In addition, for the Mexican maquiladora I also compare the findings with those for the Dominican Republic as I review each issue. The literature on policy is delayed until Section III, and the deficit in the current literature is taken-up again in Section IV, that discusses recommended studies.

THE DOMINICAN REPUBLIC

Evaluation of the Data

The Dominican Republic's EPZs are the most studied among the free zones of Latin America. Only its cousin, the Mexican maquiladora, has received more scrutiny. However, the extent and quality of the data available on Dominican free zone workers is meager. Some general information of high reliability is available on total employment in the zones, employment by industry and employment by industry by sex, principally for 1986. Much of this general data is summarized by the ILO study by F. de Moya Espinal (1986). This broad data, however, does not allow us to answer most basic questions of interest regarding workers in the EPZ labor market. To do so, we need more detailed data on workers and their jobs, that would typically come from surveys.

The ideal sort of data required for this work consists of "panels" on individuals, where observations on individuals and their jobs are taken at successive points of time. This sort of data is expensive to generate, and largely unavailable in third world countries. More traditional sources of data allowing us to address many basic labor market questions consists of worker surveys, at the household or firm level. Such surveys typically need

several thousand observations for statistical reliability, concerning more or less basic questions. The available data falls far short of these requirements.

Aside from general statistics on employment levels that are undifferentiated by sex, the principal data sources consist of two very small surveys. The first survey was undertaken in 1981-1982 by CIPAF (Centro de Investigación de la Familia). This surveyed 231 women in the free zones, and a small sample of women outside the free zones. This data provides information on workers' demographics, current employment, and some prior employment data. Several authors on the Dominican free zone employment employ this same data set [L.Catanzaro(1986), Quintina Reyes(1987), S.Joekes(1987), M.Ricourt(1986), Safa(1988)], with the best review of this literature found in S.Joekes(1987). For simplicity, hereafter "Joekes" will refer to the various works based on the CIPAF data. The second survey was undertaken by Arelis Rodriguez (1989) for the World Bank, and is the basis of the World Bank report by Rhee, Yung Whee, et. al.(1990). (The latter report's treatment of the labor market information has numerous shortcomings. Here we summarize the more useful report by Rodriguez. See summary of Rhee et al for criticisms). The Rodriguez data is similar to the CIPAF survey, though smaller. It consists of interviews with 100 women and 40 plant managers in Dominican free zones in 1989.[14]

This empirical base is very small for the analysis of basic labor market phenomena, much less the tougher questions originally targeted by our study. The small size of these data sets severely constrains the scope of statistically reliable inferences that can be drawn about even basic questions, such as average age of workers, etc.. In Joekes' words:

> Nor is the statistical picture ... fully up to date; most of the relevant survey data dates from 1981...(p.i). Follow-up work into the design of the project recommendations, whether undertaken by USAID itself or carried out by the EPZ organizations... may need to include a .. survey of Zone workers to verify these points.(p.ii)

Her remarks still vastly understate the weakness of the data base -- and hence many of the inferences derived from it -- as well as the need for more substantive empirical work. While thoughtfully drawn-up and intelligently discussed, the 1989 Rodriguez sample of 100 workers is too small statistically valid inferences. Moreover, the simple methodologies used in these studies - such as calculating averages, and cross-tabulations - do not allow us to coherently ask many questions of interest. However, the close coincidence of many of the results of Joekes and Rodriguez lend credibility to some key conclusions. In discussing their conclusions I occasionally compare them

to my interviews with the zone managers and ten plant managers and owners in the San Macroritz and San Isidro zones, in February 1991.

Despite these enormous limitations to the existing data, some clear patterns in the data stand-out across studies. Below I summarize the key factual conclusions of the authors, and evaluate their credibility. Then I will discuss important issues that are raised and unanswered, or have gone unasked. The subsequent policy discussion examines the existing policy recommendations, on the basis of their factual and logical foundation. After the policy discussion I will return to the unanswered questions and recommends further research.

Solid Facts and Likely Inferences

The labor force employed by the Dominican free zones grew from roughly 7,000 workers in 1975 to over 110,000 in 1990. This stellar growth was due largely to opening of U.S. market from the Caribbean Basin Initiative(CBI) in 1982. The female labor force participation rate quadrupled in the Dominican Republic between 1960 and 1980, reaching 42%, which is near developed country levels. Meanwhile male participation rates dropped slightly, from 91% to 81%. These conclusions come from census data and are sound. In this period, female participation in overall industry remained constant at 13.2, but increased in the manufacturing subsector from 17.5 to 28 percent (Rodriguez).

In Dominican free zones, women are employed principally in light industries, where they predominate (see appendices for the 1985 distribution of women by industry). According to Joekes, Rodriguez and de Moya Espinal, most jobs in the industries where women are employed are semi-skilled production jobs, requiring a short time to learn. Rodriguez reports a 1988 study finding that 88% of EPZ workers are semi-skilled 4% skilled, 1% unskilled. Occupational mobility is currently constrained by the 'flat' occupational distribution of the firms in the zones. Only a very small percent of the labor force is employed in supervisory or managerial positions. It is for this reason that these authors concur that there has been little occupational mobility to date by workers - male or female - in Dominican free zones.

Next we turn from more reliable census and related data to the much less reliable survey data. We report results that are shared by different authors, over the different surveys. This covers age, training, absenteeism, wage

setting and the minimum wage, work conditions, unions, marital status and children, and schooling, among other things.

First we discuss age. The women in Dominican free zones are not particularly young compared to EPZs in other countries. Yet they are young in absolute terms. Rodriguez reports the following distribution of ages of women in Dominican free zones: 12% are below age 20, 50% are between 25 and 29 years old, and 17% are between 30 and 39 years of age.

The duration of training is brief. Further, most training is specific to the task performed, and not transferable to other occupations or industries, though transferable to the same occupations in other firms. Rodriguez found 85% of the women in her survey to be trained in the EPZs, and that most managers reported such training to last one month or less. Joekes reported training to vary somewhat by industry, being longest in tobacco, as an semi-artisanal occupation, and to average two months in clothing industry. The ILO report notes that the labor code allows one year for apprenticeship and training at 40-50% of the minimum wage. But, they found that firms keep pay at this level for an average of three months. The ILO also noted that there is no coordination of training among firms or zones with the Institution Nacional de Formacion Tecnico Profesional (INFOTEP) although they pay a 1% payroll tax.

According to Joekes, absenteeism ranged between two and five percent. Moreover, she and Rodriguez found that most women interviewed said that the main cause of absenteeism is ill health of either the woman or her children. Note that this conclusion derives from self-reported data in a very small sample; still, the consistency of results over studies lends them credibility.

Wages - Originally in the Dominican Republic, EPZs were required to pay only 80% of the minimum wage. But in 1979 the minimum wage was applied to the free zones. Wages in the Dominican free zones are set near the minimum wage, though not necessarily exactly equalling the minimum wage. Data on wages comes only from these small surveys and the comparability between reported income and hourly wages is ambiguous. No systematic studies of work conditions exist. However, most studies concluded that work conditions were generally better in Dominican free zones than in domestic industry, though conditions are arduous. Hours are long, work is monotonous, and discipline is strict.

Unions and strikes are permitted by law in and out of EPZs. However, an interagency committee headed by the Office of the U.S. Trade Representative has recently been mandated to review whether or not to remove the DR from the Generalized System of Preferences (GSP, a preferential trade regime which allows duty free access for about 4,000 products) because of formal complaints regarding labor policy. Formal complaints have been filed alleging that Dominican workers in EPZs are being refused the right to organize and engage in collective bargaining. The ILO report also expressed concern as to whether workers' right to unionize was respected in Dominican free zones.

Women in the Dominican free zones are often married, or in some form of conjugal union, and have children. This differs from the pattern in EPZs in many other countries. Most studies of the Dominican Republic find roughly 50% of women in the zones are in some kind of conjugal union. However, findings vary on the number of children that women in Dominican free zones have. Joekes cites one study finding that 84% of women in Dominican free zones had children, with nearly forty percent having four or more children. Rodriguez finds that for their age group, these women have fewer children. Still, she finds that women are working to support others:

> We conclude that an important part of the household contribution of the female worker is not directed to the support of the children but of other relatives, or her own support.(p.15)

The studies concur in that many women in Dominican free zones are the sole bread-winners of their households. The significance of this concerns the nature and causes of female labor market participation. Unlike in most other countries with EPZs, women in the Dominican Republic (and, according to H.Safa, in Puerto Rico) are frequently heads of households, and not young, unmarried, childless; therefore, the labor market participation of the women in Dominican EPZs is unlikely to be transitory. As mentioned above, the female labor force participation rate quadrupled in the Dominican Republic between 1960 and 1980, reaching 42%, which is near developed country levels. Meanwhile male participation rates dropped slightly, from 91% to 81%. Beyond these broad facts, however, little is known. The effect of the EPZ on these labor market participation, other causes of changes of labor market participation, or why the nature of female labor market participation in the Dominican Republic and Puerto Rico differs from other Latin America and Asian countries is unknown.

The studies' findings also agree that the managers interviewed accept or even prefer women with children or other dependents. The reason managers cite is lower turnover by these women, due to the financial responsibility

entailed. The manager and personnel director of the private San Isidro zone, whom I interviewed, also expressed this view. In the San Isidro zone, most workers are hired through the zone's personnel service; that service has been able to lower turnover from 20-30% when the zone opened to only 1% today. It is worth noting, though, that this information is reported by managers and not independently corroborated.

A surprising result concerns schooling. Though most occupations in the zones involve only very modest skill, learned on the job in a short period of time, the schooling level of workers seems to play an important role in firms' demand. Schooling is relatively high for women in the Dominican free zones. In the CIPAF sample, 56% had some elementary school education; 38% had attended high-school and 3% had some college. Rodriguez found that 35% had some level of high-school, 17% had 7 or 8 years of schooling and 10% had some university education. Thus, 95% had some formal education and 83% had at least primary or secondary education. These compare to the national figures of 28% of females being illiterate and 16% of women 15-59 having had 6 years of schooling. Joekes found that electronics firms required eighth-grade schooling. Our interview of the San Isidro Zone authority, that recruits most of the workers for its firms, found that they have the same requirement. Managers in most firms we interviewed also supported this, although not in the jewelry plant we visited. Our interviews and Joekes, however, suggests that women with educations much in excess of the eighth grade are not desired by managers as production workers. The reason managers or personnel directors give is one of mis-matching and turnover: women with higher educations are more likely to quit. Joekes reports that wages increase with education until secondary school graduation. "Post-secondary school attendance brings no significantly higher wage than primary school attendance."(Joekes, p.51) The evidence, however, is inadequate to evaluate this. Finally, Joekes and Rodriguez both report indirect evidence that the labor market for the kind of women desired by Dominican free zones has become tight. Rodriguez's managers said that turnover was between twenty and forty percent, annually. Further, these managers cited retention of qualified labor as their greatest labor market problem, and difficulty hiring qualified women as their second most important problem. And, the managers prefer previously trained workers with some basic relevant skills.

Unanswered Questions

Some questions were asked, but cannot be answered because of the weak data used or limited methodologies employed. Some are hard to answer even with the most sophisticated of data sets and methodologies. Here we turn briefly to the more important questions.

Unanswered but Asked

We do not know whether the percentage of women in given occupations in particular industries changes over time, as changes in labor supply or demand conditions change. Basic information on sex composition by industry and occupation - or even by industry alone - through time in the Dominican free zones is absent. Reliable sex composition is available principally for 1985, and cannot be determined from the tiny samples collected. It appears that since 1985 the overall percent of women in Dominican free zones remained roughly constant at 67% (Rodriguez). No authors carefully examine the data to determine the determinants of the sexual composition of the EPZ labor force. However, my casual examination of the ILO data suggests that the high percentage of women is a result of the mix of industries in the Dominican free zones, rather than more women being hired in the a given industry in the zones compared to the same industry outside the zones. A more careful examination would be useful in predicting the demand for women by EPZ firms. This examination would help us understand the determinants of that demand. It would also help us determine whether the sexual composition of occupations within given industries is evolving, so as to lessen sexual segmentation across occupations and industries.

The sources of turnover have been only superficially studied. Most of the evidence on this subject consists of comments by managers on the reasons why workers quit, particularly in relation to marriage and children. No objective corroboration of those judgements, quantification of the magnitudes involved, or simply deeper probing into the issue has been undertaken. This is a serious shortcoming: one that is potentially very important for policy, since voluntary turnover can be costly to firms, and even workers. Involuntary turnover can also be costly to workers. Below we discuss one possible sort, related to an age limit by firms. Later we return to this in our discussion of recommended studies.

A related concern is firm turnover. The issue of firm turnover is superficially raised by the ILO report, but not studied for want of serious data. Such data ought to be fairly easily gathered, and would add useful insight into the evolution of firms in the zones, and the impact of firm turnover on workers in the zones.

The impact of the Dominican free zones upon female labor force participation is not seriously explored by any of the authors, though much tangential work is explored. Nor is serious thought given to the implications of this issue, or to whether the causes of participation are statistically identifiable. Generally, however, the high rates of female participation and high rates of increase in those rates for the economy suggest that there is more to this trend than simply the EPZ growth. More serious thought concerning the relevant issues and methods is required.

Mobility - Several types of mobility are considered. These are important to evaluate the impact of the EPZs upon women. From where do female workers in Dominican free zones come? Do the zones contribute positively to that mobility? Is there occupational mobility within the firms? Is there movement of workers within occupations but across firms within the EPZs? Finally, is there economic mobility of women from the EPZs to micro-enterprises outside the zones? And, with respect to all these questions, have the patterns changed with time?

There are no reliable findings concerning these important questions relating to issues of mobility. Rodriguez argues that women improve economic status and work place conditions by going to the zones; this is especially true for the twenty-three women (of the 100 sampled) who were previously domestic servants. In her sample of 100 women, two thirds said they had been previously employed. Of this group, half said they worked in another firm in the same free zone, (12%) said they were maids, 9% were in an industry outside the zone, and 12% were own-account or in non-industrial employment. The remaining one third of the women had no previous work; half had been in school, and the rest had been unemployed or housewives. Of those unemployed, 72% said they remained unemployed for less than three months before current job. From this information Rodriguez concludes that women leavers can get a new job fast and that one third of female EPZ workers got their current job shortly after entering labor market or after leaving prior employment. This finding is interesting, but has no statistical validity. It is anecdotal, and should be treated as a group of case studies, whose representativeness is unknown. In that limited context, these results are suggestive and deserving of further investigation. There are also methodological questions concerning this approach. For example, occupational mobility that does not control

for factors such as age -- as is the case of Rodriguez's work -- is suspect. Many young people in the United States take on low level service jobs in their youth, and go on to high status and high pay professional positions. However that could simply describe an occupational life cycle that has been constant for many years, uninfluenced by changes in the labor market (the growth of EPZs, in our case). What other things are changing in the Dominican Republic's economy over this period? In the econometrician's framework, these are "omitted (from the statistical controls) causal variables" that may be correlated with the movement of individuals to EPZs. The stagnation of the Dominican economy would tend to lessen the damage from excluding such controls for external macro conditions. Yet we are still saddled with the tiny samples. Sample-selection bias is another potentially major problem in interpreting the data, even were the samples to have been larger. Better methodology might compare persons over different trajectories, or compare the mobility patterns of similar types of persons across countries -- where one country had EPZ growth and the other *did not. The difficulties are myriad, but the existing data and methods does not even come close to the mid-way point in dealing with these problems.

Concerning mobility of women from EPZs to micro-enterprises Rodriguez finds that managers knew very few women who after working in EPZs left to open commercial or services microenterprises. Most left for jobs unrelated to jobs in EPZs. She cites other evidence from Association para el Desarrollo de la Microempresa (ADEMI) that women from EPZ are not moving to opening micro-enterprises. She concludes "It is doubtful that managerial and administrative skills are being developed among the EPZ female workers."(p.19)

There is virtually no information on occupational mobility within the firms. The most powerful argument regarding this concerns the current occupational distribution in the zones: that it is so 'flat' that there is little opportunity to rise up within or between the firms. This fact and reasoning is sound. However, it does not address the issue of whether there is evolution in the types of occupations, due to changes by firms or changing mixes of types of industrial activities. Data does not exist for the Dominican Republic that allows us to answer that. A related question concerns whether there is a cumulative process whereby EPZ development engenders skill formation; and that this skill formation, in turn, leads to more skill-intensive investment; and this more skill-intensive investment would reinforce the supply response by workers that raises the skill-level of the labor force; and so on.

Another issue on which we do not have close concerns occupational segregation. While recognizing that Dominican EPZs have been a major source of employment for women, she concludes that the EPZs have perpetuated occupational segregation.

> by perpetuating occupational segregation by sex .. EPZs have not contributed to the assimilation of women in to the employed labor force on equal terms. [Moreover, EPZ employment] represents no improvement in the types of jobs available, being unskilled, dead-end work. There is no evidence that EPZ firms offer better physical conditions ... than domestic industry...; there is no individual wage progress.

Joekes fails, however, to substantiate these claims. The skimpy existing evidence is consistent with these claims, but does not allow us to distinguish between Joekes sharp judgements and alternative interpretations. In general this evidence does not allow us to distinguish between demand and supply side causes of the occupational distribution; nor does she provide or cite an analysis of the effect of the EPZs on the occupational distribution in the overall economy. As to the jobs being dead-end, this appears true, yet no comparison is made with these women's alternatives in the home, in commerce, as domestic servants, etc.. There are worthwhile issues for examination here, but her claims are wholly unsubstantiated.

A crucial question that received some attention (Joekes(1987)) concerns whether there is a maximum age after which workers, particularly women, in free zones are fired. Joekes says:

> The outstanding question is to what extent employers will enforce upper age limits in their workforces, ... and at this point the matter is indeterminate.(p.68)

There is a suggestion in the data, and most key authors believe this to be the case. If this is so, it would have an enormously impact upon the careers, and hence welfare, of women. Moreove[illegible]ld be important to understand the reasons for this to design policies to mitigate it. Moreover, it would be cruci[illegible]erstand what happened to the women who were fired. As Joekes recognized, currently we do not have enough [illegible]determine whether such an age barrier exists. Even if we knew the actual distribution of ages in the EPZ labor [illegible]his alone would not tell us whether there were an age barrier, principally because demand and supply are [illegible]ngled in such information. Do the women tend to quit after a certain age, or are they fired? Proper investigation involves, ideally, information on tenure in the firm, age of the worker and the cause for leaving the firm. Later we return to this in our discussion of recommended studies.

Some authors using the CIPAF data concluded that wages in 1981-1982 were lower in the zones than in domestic industry, but Joekes, Rodriguez and the ILO concluded that wages of women in the Dominican free zones likely equaled, or slightly exceeded, those in domestic industry. The comparison of wages in and out of the free zones is extremely weak. The proper comparison would compare wages for workers controlling for a variety of worker characteristics. Even in the CIPAF data where such controls could have been added, they were absent. Ideally, one would also like to control for the industry, whether the firm was domestically or foreign owned and for unionization. No such studies were possible.

With respect to wage discrimination between men and women within the free zone, there is no reliable evidence. Here too controls for worker characteristics as well as industry, firm and unionization ought to be included. The relevant data is lacking. Similarly, there is no reliable evidence on sex discrimination in promotion across occupations. According to Joekes, the rate of unemployment for women also exceeded that for males. This apparently comes from the 1980 census, but nothing is explained as to its reliability (measuring unemployment is tricky), nor is more detailed data or other time period available.

As discussed above, many questions relating to the effect of EPZs upon women's social status, family structure, marital status, the number and timing of children, living arrangements with relatives, the responsibility for nurturing, and other household production activities typically performed by women are also asked but unanswered. Joekes claims that working in the zones does not relieve women of their work at home. However, here she oversteps the bounds of her data. Her data consists of one small cross-section. Her evidence suggests that in 1981 employment in the EPZ did not lead to all such women being relieved of work at home. However, from her data we cannot determine if there is a diminution of such responsibilities, or the answers to the other questions mentioned here. A much larger sample allowing a statistically valid comparison of such responsibilities between the zone workers and other equivalent (i.e. controlling for worker characteristics) workers outside the zone could shed much more light on these questions.

Next I briefly list some questions meriting investigation that have not been pursued. We will return to some of these in the section discussing recommended studies.

We know nothing of the trend in the schooling levels of workers in the free zones. Ideally, we would like to know this at the industry and occupation level, broken down by sex. Though schooling levels for women are higher in the EPZs than in the population at large, no studies examined effect of the supply of schooled workers upon the level of EPZ demand for labor, or the occupational structure of EPZ demand for labor. Managers complained of the inability to find "qualified" workers and a "tight" labor market, so the supply of educated workers may already be a constraint upon EPZ growth int he Dominican Republic. A related issue that was not examined concerns the circumstances in which and to the extent to which shorter-term training can alleviate the shortage of educated workers. No studies go after the deeper, but obvious issue, of what about schooling is useful to firms. Given the low skill levels of the tasks, it is possible that schooling produces workers whose socialization is more to firms' liking; alternatively, it may be the cognitive skills acquired that are useful to firms. Answering these questions would aid in education and training policy geared towards EPZ expansion and export promotion.

Macro dynamics are largely ignored. Candidates for study ought to include the impact of the EPZ on wages in the rest of the economy. A specific issue bearing attention is the nature of the wage floor in the Dominican Republic, given that the Dominican Republic shares the same island with Haiti. Haiti is even poorer than the Dominican Republic, and anecdotes abound concerning how the EPZs have soaked up female labor from commerce and, especially, domestic servant positions. If true, such would be clearly positive: that would tend to mean that the EPZs are raising living standards economy-wide. However, to what extent does the existence of an enormous reserve of surplus low-skill labor in Haiti doom the Dominican Republic to a very long time horizon until the wage floor will rise significantly. It may be that greater coordination of macro and industrial policies is needed across the two states sharing the same island.

Another macro-dynamic issue concerns minimum wage policy and EPZ investment and employment. Available data suggests that EPZ wages for production workers are set at or near the minimum wage. It is widely believed that low minimum wages in the Dominican Republic have encouraged EPZ investment there. However, it is not clear whether slightly higher minimum wages might lead to welfare gains without discouraging investment. Alternatively, it is conceivable that the minimum wage truncates the demand for labor at the minimum wage, and is the source of the higher than average educational levels. It should be emphasized that this latter hypothesis is

not suggested by any of the interviews by Rodriguez or ourselves with managers. The point is that next to nothing is known about these important issues. Such policy would need, of course, to be considered in the larger macro-economic context, since the minimum wage is important in many sectors outside the EPZs.

Conclusion

The above review of the Dominican literature analyzes and highlights the extreme weakness of the labor market data on EPZs there, while discussing those findings that seem more credible. Findings on basic issues that were shared across the surveys and agreed with managerial interviews and our own interviews were discussed in detail. In the policy discuss we will turn to those policy recommendations in the existing literature and evaluate them in relation to this empirical base. We discussed questions that were raised but unanswered by the data, and questions that ought to have been raised but weren't. We return to those questions in our discussion of recommended future studies. Next we turn to the review of the literature on the Mexican maquiladora.

THE MEXICAN MAQUILADORA

As previously mentioned, Mexico was substituted for Costa Rica after extensive searching revealed almost no information on employment in Costa Rica EPZs. As the preceding review of legislation makes clear, the Mexican maquiladora that we review is not a free zone, per se. Among the key differences from the EPZ is that maquila firms a free to locate throughout the country, and have flexibility in the amount of production dedicated to exports. Maquila firms are a similar to firms in other EPZs, in that they have historically been concentrated in light manufacturing and employed predominantly women. As an older, larger phenomenon than the Dominican Republic EPZs, there is a relatively large amount of study done on the maquila firms. Moreover, enough time has elapsed to allow some examination of the maquila firms' evolution - unlike in the Dominican Republic.

There are six central studies concerning the maquila labor market. The most valuable is an ILO paper by Pedrero Nieto, Mercedes and Saavedra (1987). This has better quality information than other studies, although the authors report little detailed data that would allow deeper analysis, and the analysis over-reaches the data in several

instances. The second study of interest is by Susan Tiano(1990). Its focus is upon participation patters and causes, though we found this work wanting in analytical clarity and for better data. Leslie Sklair's 1989 book on the maquila responds in large part to arguments by Tiano concerning labor force participation issues. Nigel Harris(1990) has a useful review of three works on the maquila that give some information on its evolution. Finally, in an unpublished paper Ellwyn Stoddard and Bianca Verdugo-Vidales(1991) (hereafter simply Stoddard) present a discussion of ownership and labor turnover; its data and methodology are quite limited.

Overall, the literature on the Mexican maquila is weak, suffering from similar ailments affecting the work on the Dominican Republic: small samples (larger than in the Dominican Republic, yet still small), weak methodology and poorly worked-out conceptual frameworks. It also focuses a great deal of energy on the debates relating to labor force participation that are neither particularly relevant to the Dominican Republic and other countries, nor conceptually or empirically rich. However, this literature contains information that overlaps on a number of issues discussed for the Dominican Republic. In what follows I focus upon this intersection of issues. First, however, I turn to a brief evaluation of the data.

Evaluation of the Data

There is richer general data on the maquila than on EPZs for the Dominican Republic. Employment levels -- and sometimes wages -- are often available by sex and industry. On the other hand, little of that data has been carefully examined. The ILO study makes the best use of general data from secondary sources. As with the Dominican Republic, more detailed data typically coming from surveys is required to answer the central labor market questions with which we are concerned. The ILO also used a survey of 479 workers from Ciudad Juarez. That sample is roughly two and five times the size of the surveys for the Dominican Republic, though Mexico is a far larger and more diverse country. The ILO study makes good use of that data, using straightforward methodology. Tiano apparently uses a small survey, but offers little documentation on the survey. Stoddard and Verdugo-Viales have a tiny survey: "six managers and appropriate staff members were interviewed to determined the extent of discontent among workers (as reflected by the turnover rate).."(p.13) They also interviewed 78 workers, about half in a multinational and half in a national firm. In sum, all of the caveats applied to the

Dominican Republic literature apply in similar measure to the literature on the maquila. The most interesting and credible work comes from the ILO report. Next I present information that overlaps with a number of issues discussed for the Dominican Republic, briefly summarizing that material and comparing it with the Dominican Republic. Then I present information, on the Mexican maquila of broader relevance, that is unavailable for the Dominican Republic free zones.

Comparison of Labor Market Findings for the Maquila and the Dominican EPZ

Next we discuss similarities, and then differences, in findings concerning women in the maquila and Dominican EPZs. We find similarities concerning age, turnover, schooling, experience, training, hours worked, health data, savings and access to financial institutions. We find differences concerning the marital status of women and the number of children they have.

Age - Women in the maquila are young, as in the Dominican Republic. According to the ILO study, 68.2% of women in the maquila are 15-24 years old. This differs from men, whose distribution is not clustered at young ages. Overall, the median age of women is 22.43 versus 24.6 for men. There are important differences in age distribution of men and women by industry: young women are found in transport, electronics, electrical equipment, machinery, minerals (the average age is 21 to 22). Stoddard presents evidence from his six manager interviews that multinational firms hired younger workers.

Turnover - Regarding turnover, Stoddard states that "high levels of labor turnover are generally seen in apparel maquilas where workers benefits based on piece-rate wages generally result in lower take-home pay."(p.10) The most important cause of high quits was low pay, and they suggest that multinational firms' higher pay and greater occupational complexity allow for more promotion and, hence, less turnover. They found that multinationals reported 36% less in annual turnover rates than Mexican owned plants. The ILO study finds considerable variation of tenure, and hence turnover, patterns across industries and plants. They find that in plants with higher median age, the percent of women with more than six years of tenure is higher; the average percent of women with more than 6 years of tenure is 17 percent; in the food industry this percent is 44 percent. In general, turnover is quite

high in both the Dominican Republic and the maquila. However, it may be that there is more variance in the turnover rates and tenure distributions of workers in the maquila. This may be due to different mixes of industries.

Schooling - The ILO and Sklair report that schooling for women in the maquila is above the national average. This finding is similar to the Dominican EPZ. According to the ILO, schooling levels tend to exceed the required minimums to perform the tasks. Women in maquilas have higher levels of education than the population in general, whose average is 3.3 years, versus 4.7 in the maquila. "There seems to be a maximum level of schooling for women: there are almost no women with more than 3 years of 'preparatoria'(p.51)". In addition, the ILO finds a different pattern from men to women: 49% of women have finished primary school, versus 27% for men. Also 30% of the women have begun secondary school; of these 10% have worked briefly, often in teaching. 14.6% of the women have finished secondary school, versus 17.1 % for men. In summary, compared to men, women are more concentrated in the primary education levels, and less concentrated from secondary on.

Prior Experience - Maquila firms do not appear to require significant prior experience, according to the ILO report. They find that 47.7% of workers are new labor force entrants. More tenuously, they argue that given the young average age, those with experience must have short experience. They further find that training is brief and very specific to the task. Fifty-five percent of those with training had training between one day and one week. When training is formal, it is still less than eight weeks. Since comprehensive data on experience is not broken down by sex, the ILO conducted used a survey of 479 women from Ciudad Juarez. They found 31% had worked before the maquila. They concluded that if this is representative of the population, then more women than men enter the maquila without experience, because the average percent of all men and women entering the maquila with experience is 52.3%. These results for experience and training in the maquila are similar to the Dominican Republic EPZs, though the training periods may be even shorter in the maquila.

Hours Worked - Hours worked are similar in the maquila and the Dominican EPZs, being approximately 10 hours per day in the maquila. The ILO reports that 15% of maquileros work more than the required 48 hours per week. Of these, 81% work 10 hours/day. Maquileros seem to work fewer overtime hours than workers outside the maquila. Twenty eight percent of workers outside work overtime (23% of women). However, the ILO stresses that these comparisons are not strictly valid, because the work is much harder in the maquila.

Health - Another similarity between the literature on the maquila and the Dominican EPZs concerns information regarding the impact of EPZs on health: there is none. "There are no data on occupational disease in the maquila"(ILO p.51) The ILO finds the physical and psychic conditions of the maquila are hard on health. Boring and monotonous work tasks lead to turnover (p.57)

Wages - Finally with respect to wages, the ILO finds that wage patterns in the maquila mirror national patterns. They claim that women earn less than men, although this is not a comparison that can test for sex discrimination since controls for worker comparability are not included. Many workers earn below the minimum wage: 18.6% of women in maquila earn below the minimum wage, versus 9.8% for men. Only 27.7% of women in maquila earn more than the minimum wage, versus 53.8% for men. It seems clear, that the minimum wage is central in the wage setting process in the maquila, though a thorough examination of the role of the minimum wage is lacking - as it is for the Dominican Republic. An interesting anecdote by the ILO was that employers say that women earn less because women's wages are only complimentary to [the man's] wage. Similar arguments were used to justify paying single men less in the California Civil Service in the 1930's. These are discriminatory arguments, whereby pay is not set equal to marginal productivity but according to 'fairness' or worker 'need'. Similar remarks by Dominican employers were not reported.

Savings - As with Joekes, the ILO finds that workers do not earn enough to save, and there is no unemployment insurance in Mexico.

Next we turn to the differences between labor market findings for the maquila and the Dominican EPZs.

Marital Status and Children - The principle difference in the findings for the maquila as compared to the Dominican Republic EPZs is that women workers in the maquila are principally unmarried and with few children. Employer interviews, moreover, show a conscious preference for unmarried women without children, to reduce turnover. As discussed above, in the Dominican Republic, the opposite is true. The maquila findings fit the Asian experience. The causes of this divergence are unknown and unexplored.

Evolution of Firms - The principal results for the maquila that are not comparable to the Dominican Republic concern the evolution of maquila firms. Nigel Harris reports that through time the size, diversity of ownership and skill levels of the maquila firms has grown dramatically. He ascribes these to explain changes in

the occupational distribution, and argues that maquila firms in similar industries had similar sex and occupational distributions to similar firms in the U.S., though careful documentation of this is not presented. If this information is accurate, it suggests that a more dynamic view of the evolution of the firm in the EPZ in the Dominican Republic and elsewhere is warranted. A deeper look at this evolution, however, would be needed for a firmer understanding of the trends.

Unanswered Questions

The preceding discussion presented those key results on the maquila labor market that were judged to be reliable. As explained, the literature on labor force participation and the maquila was confused, and of limited general value. The extensive discussion of unanswered questions on the Dominican Republic EPZ labor market is equally relevant here, and will not be repeated.

Next we turn to the literature's discussion of policy issues, and our evaluation of that discussion.

SECTION III: POLICY

Introductory Comments

The literature on the maquila has little direct discussion of policy, so we concentrate on the policy discussion in the Dominican EPZ literature. The principal discussions are found in Joekes(1987) and in Rodriguez(1989). Their policy recommendations concern services that could be extended by zones to workers, and in one case to firms.

Joekes and Rodriguez's policy recommendations are basically identical. Their recommendations are largely responsive to the core of reliable empirical findings -- that I have described. They have three types of limitations, however. First, their policy recommendations lack good links to issues of implementation. Both sets of policy recommendations are weakly linked to the agents that might effect changes: zone authorities, firms in the zones, firm associations, or the Dominican government. Second, financing is not discussed. Specifically, the Joekes study was commissioned by AID, but does not carefully tie its policy recommendations into AID practices.[15] More adequate funding is prerequisite to the generation of more serious policy recommendations. The third drawback concerns conceptual clarity.

Summary and Evaluation of the Recommendations

Preliminary Remarks

The policy recommendations would benefit from a richer conceptual foundation. The recommendations made are for the joint provision of services by firms in the zones. Good policies ought to respond to the existence of returns to scale in the provision of such services, or in internalizing externalities. Such polices ought, moreover, to emphasize private vendors, incentives. and build-in market signals where possible. Finally, policy recommendations ought to identify the different agents involved, identify their interests and map-out their roles in the implementation of policy. One further point is worth brief discussion: Joekes says that policy must raise labor productivity. This, however, is too strict a criterion. It rules out any modest (non-Pareto improving) redistributions that yield large utilitarian welfare gains, as well as Pareto improving policies that improve workers' welfare without hurting productivity. One could perhaps argue for Joekes criterion on the basis that employer support is required

for feasible policy, and that higher productivity is the only way to get employer support. However, some policies that only require employer neutrality will be feasible.

Joekes and Rodriguez make five recommendations. First they recommend setting up medical clinics in the zones. Second they recommend establishing training facilities. Their third recommendation is to establish savings and loan institutions to help workers save. Their forth recommendation is to establish cafeterias in the zones. Finally they recommend that child care be provided by the zones or firm associations.

Joekes identifies two groups of agents: the zone authorities and Association of Industries as good vehicles for developing or actually providing these services, without mapping-out more detailed roles for these groups to play and for the actual provision of services. The feasibility studies she calls for would need to elaborate these roles. Without explicitly saying so, both Joekes and Rodriguez's arguments largely depend on the assumption that firms will reap economies of scale by banding together in the provision of services. Overall that seems reasonable, though explicit, detailed attention to such economies of scale is needed. Next we discuss the five recommendations.

Joekes recommends establishing medical clinics in each zone. One reason for this seems to be the inadequacy of the national health care system:

> The government is supposed to supply medical services, drugs and both routine and emergency care from the IDSS. The IDSS is to be co-financed by firm contributions and a matching government contribution. However, the government has often missed its matching contribution. As a result, health services are inadequate. (p.70)

Moreover, Joekes and Rodriguez separately find that absenteeism appears to be caused principally by the health problems of the female workers of their children. Thus we surmise that Joekes means to argue that the provision of health care clinics -- by the zone authorities or by the firm associations in the zones -- would raise worker productivity. This claim is plausible, given the data. However, more information on the magnitude and causes of absenteeism, and related productivity losses to the firm, is required to substantiate her recommendation. This information would also provide direction to policy design. Also, Joekes' recommendation to locate clinics in the zones ignores her finding that the children's illness is a central cause of absenteeism. Given poor transportation and long distances to work, the children would be unable to use the clinics.

Joekes and Rodriguez recommend establishing a training facility to supply a potential workers to expanding and new firms,

> practiced in basic industrial routines and familiar with the special production procedures of export processing operations; the "special procedures" would follow a generic training course in clothing, leatherwork, shoes or jewelry manufacture of about one month's duration. This would especially help small companies.'(Joekes, p.82).

The support for this policy consists, apparently, of four observations. First, that there is no coordinated training effort; second, from interviews of managers there appears to be a shortage of 'qualified' workers; third, some firms are moving towards the provision of training:

> One of the newest zones, San Cristobal, has designated one of the new zone buildings as a <u>training facility</u> for newly recruited workers, and the industrialists of San Pedro de Macoris are considering such a scheme for their own zone. (Joekes, p.68)

The fourth observation is the basis for Joekes judgment that training would help small firms.

> The one Dominican-owned enterprise interviewed for this report was struggling under the costs of training workers and the need to obtain sufficient orders to maintain the work on hand, so as not to have to train new workers again when business rose.(p.83)

This evidence for training facilities is reasonable, but not overwhelming. Questions of the following sort remain unanswered. Since Joekes and Rodriguez and the ILO claim that training is brief, why should training be such an obstacle? Can training facilities adequately convey the skills and socialization firms require? Why offer training jointly: are there returns to scale in the provision of training across firms? What educational or demographic backgrounds must workers have in order for them to be successfully trainable? For example, is general education -- that we saw earlier to be a worker characteristic that firms demand -- a requirement? If so, is there not a shortage of just such educated labor? And if so, is it possible to have "crash" general education courses that can quickly increase the supply of labor with adequate general education. What evidence do we have that training actually works? There is very little information on these issues of training for the Dominican Republic.[16] There is a literature on many of these questions -- and the consensus on training has shifted somewhat in recent years --, but this literature is not discussed. More information on the role of training and its interaction with general schooling, in the Dominican Republic and elsewhere, is required to evaluate the training recommendation, and to elaborate good training policies.

The third recommendation is to establish savings and loan facilities. Joekes explains that:

> existing financial services fall into two categories: cashing checks and personal loans. Workers are paid by check and since most do not have bank accounts, they have to rely on local moneychangers, who charge a high fee. Most employers provide credit on a personal, ad hoc basic... These loans are normally in the form of an interest free advance against the next paycheck,.. The La Romana COOZOFRAR is the only consumer cooperative and large credit program. It has grown quickly.(p.74)

This evidence suggests that better developing better financial services could be efficiency and welfare enhancing, and feasible. A feasibility study would require more information on workers' savings and spending habits, and more study of who ought to provide such services, and how.

The fourth recommendation is for the provision of cafeteria services. More elaboration on this is needed. The final recommendation is for the provision of child care. Rodriguez says this should be close to the home. The evidence supporting child care this is scattered, though pervasive. The number of Dominican women with children is very high. Migration to the zones appears to have tended to separate working women from extended family members that could care for children. As we have seen, absenteeism is linked to children's health problems. Much more than this is not known. Rodriguez says that women presently working in the zones must pay for their own child care, but no evidence is provided. As with their other recommendations, more information is needed. For example, information on women's private contracting of child care would be helpful to determine the potential demand for such services, and information on what women are currently paying would help analyze the economic viability of joint provision of such services. We do not know whether some women's labor market participation is impeded by the absence of such services; nor do we know if women are force to retire from work to take care of children, etc.. Presumably there are returns to scale in the provision of child care, but this is not explicitly discussed.

A Synthetic Proposal

The foregoing recommendations are discussed in isolation. Workers need: better health care for children and workers, child care for children, and improved transportation for workers. As such, they are partially contradictory and fail to capitalize upon the complementarities that a linked package of services could provide. Placing medical centers in the zones would exclude children, given difficult, costly transportation to the zones, and

the absence of child care centers at the zones. Moving child care to the zones would create new problems: there is inadequate space in the zones to accommodate child care, and it would be inefficient, since real estate values in the zones are far higher than in the residential areas; it would also add additional expense to workers and overburden the transport system.

At the same time, there are significant returns to scale in child care provision, in health care provision, and in transportation. For all of these, however, increasing returns to scale drop off fairly quickly. To most efficiently combine all these factors, I propose linking the provision of services into a satellite system where child care, health clinics and transportation are linked. Under this plan satellite centers would be established in the residential neighborhoods. These centers would house child care services and health clinics and serve as the nodes of transportation to the zones. If this could also be coordinated with the location of primary schools, the set up would be even more efficient. This arrangement would combine the scale advantages of each service without the sacrifices inherent in the previous recommendations. Health care centers would be able to attend to both children and parents. Transportation to the child/health care centers would link efficiently into the path to work, and in fact, by grouping workers to these poles, the arrangement would facilitate the establishment of a semi-centralized transport system from the centers to the zones.

Provision of services would be by private vendors, under competitive bidding and subject to some regulation by the zones, firm associations in the zones, or the government. Infrastructure for the centers -- a architectural design, and construction -- might be provided by the zones or firm associations, perhaps with loans by international lending agencies. The transport system, as well, would be private, though overseen by the zones or firm associations. A feasibility study would require careful study of these issues, and elaboration of the plans and options for organizing and financing the set of activities.

Additional Proposals

The first proposal is for more resources to be applied to the collection and professional analysis of comprehensive data on labor market issues relating to the zones. The second proposal is for more resources to be

applied to the elaboration of serious feasibility studies concerning both the proposals discussed above and proposals that would are now premature, but that would emerge from this collection and analysis of data.

Next we discuss future studies. Some of these studies would be careful feasibility studies of the proposals discussed above. Some would directly lead into concrete policy recommendations. And, some would be broader in nature, guiding the vision of policy by deepening our understanding of various aspects of the EPZ labor market.

SECTION IV: PROPOSED STUDIES

The state of knowledge regarding Latin American EPZ labor markets is severely wanting. This lacuna in our knowledge renders the enumeration and discussion of needed studies an enormous task. While full elaboration of these studies requires another report, there are three key issues needing study worth particular emphasis. The first issue to emphasize is the translation of the recommended policy recommendations into action. To do this requires detailed feasibility studies of the provision of the services to workers that was discussed in the previous section. The second issue requiring study is the role of schooling in the EPZ productive process. This study should verify and analyze the apparent shortage of workers with adequate schooling, and determine how to respond to this short-fall, in the short and long-run. Study of schooling must further embrace the interrelationship between schooling and different types of training. The third issue requiring study concerns whether there is a maximum age at which women, and other workers, lose their jobs in EPZs. This study should also examine what happens to workers who lose their jobs, how this differs across sexes, and what can be done to mitigate its incidence and damage.

Sections Two and Three of this report discuss most of the important issues raised -- or ignored -- by the existing literature. The list of issues is long and the existing literature fails to arrange these issues into clear conceptual categories. Rather than repeat this long and chaotic list, I organize these issues into conceptual groupings, as a preliminary step towards the elaboration of an integrated program of research. I end with recommendations and remarks concerning the actual empirical work needed. First, however, I briefly discuss the context in which to view EPZ labor market issues.

What is the overall context in which we should view the issues of EPZ labor markets? Recall from the introduction that while EPZ labor market issues are related to much discussed labor market issues associated with broader trade promotion and Structural Adjustment, they are different in some key respects. Today many economists and policy makers are calling for programs to augment the accumulation of human capital and thereby alleviate mis-matches in labor supply and demand that arise from trade promotion and Structural Adjustment. EPZs constitute partial trade liberalization, or initial steps to trade. However, EPZ labor market issues are distinct from these broader trade promotion and Structural Adjustment because EPZs principally involve foreign investment. This external source of investment has typically led to only second-order changes in the level and structure of domestic demand for labor. Thus, EPZs generally have led to less severe structural reallocation of resources in the domestic economy and labor market than the broader reforms Dornbush is discussing. Though it is important to keep in mind the broader context trade reforms of which EPZs can be a part, for these reasons our discussion of EPZ labor market studies will not attempt to address the labor market concerns associated with more extensive trade promotion and Structural Adjustment.

State of Existing Knowledge -- The weakness of the existing work on the Latin American EPZ labor markets, and on women in EPZ labor markets, cannot be overemphasized. There is a striking dearth of information and analysis on this subject at all levels. Six defects merit mention. The first deficiency is that little theoretic literature is available. The second shortcoming is that basic descriptive statistics, such as information on the number or type of firms and workers, are unavailable for most Latin American countries with EPZs; and when available, they are limited in scope. The third deficiency is the absence of serious analyses of those basic descriptive statistics. The fourth, and key, problem is that detailed survey data on workers and their firms only exist for Mexico and the Dominican Republic; yet even these surveys are few in number, have tiny sample sizes, and are limited in the comprehensiveness of their information. Their minuscule sample sizes means these data sets cannot answer most labor market questions of interest. Even many of the descriptive measures from these data sets are, at best, weakly statistically significant. The fifth shortcoming is that the several analyses of these data sets use rudimentary conceptual frameworks and methodological techniques, that are not capable of addressing most key questions. If our concern for the efficiency and welfare outcomes of EPZ labor markets is to be translated into action, then these

deficiencies must be addressed. To do so will require more resources for research than have been available to date. Good policy cannot be formulated in a vacuum.

Issues Requiring Further Research

As discussed in the introduction, issues concerning EPZ labor markets divide into two broad groups. The first group takes the EPZ as a given. Within this group we ask partial equilibrium questions, such as how to improve the efficiency and welfare outcomes of the EPZ labor market. More ambitious questions of a general equilibrium nature concern how EPZs change conditions and behavior of workers in and outside the EPZ. The second group of issues concern comparing EPZs to alternative policies, notably trade promotion policies. Following the core of our assignment, and nearly all of the literature on EPZ labor markets, I focus on the first group of issues that take EPZs as given, and more narrowly upon the partial equilibrium questions concerning how to improve the efficiency and welfare outcomes of the EPZ labor market. Since the literature does not do a good job of classifying the issues raised into coherent conceptual groups, and since so many issues require study, I first organize the laundry list of issues requiring study into broad conceptual groups. I then briefly discuss the type and organization of the studies that should be done. To coordinate the investigation of the many different research issues requiring attention, I recommend an initial two stage research planning project. The first stage would elaborate an umbrella plan of integrated research proposals; this plan would capitalize on the overlap of many issues and the complementarities of the required studies, and avoid what otherwise would be inevitable and wasteful duplication. The second stage would elaborate the guidelines and broad methodology of the sub-studies within the context of this overall research umbrella plan.

As discussed above, my focus here is on studies that take the EPZ as given and ask how EPZs effect the labor market, and how policy can augment the efficiency and welfare outcomes of EPZ labor markets. Within this overall focus, I organize the issues discussed in Sections Two and Three of the report into the following four categories: labor market outcomes, labor supply, labor demand, and policies that by augmenting services either increase labor supply or simply increase workers' welfare.

This organization of issues into unifying economic categories is more than a way to organize the presentation of an otherwise chaotic list of topics. Indeed, by failing to clearly identify the relationship of issues to the basic causal economic framework, the existing studies are generally unable to untangle observed phenomena from the underlying supply and demand factors. Frequently questions have not been framed coherently, or when coherently asked fail to develop statistical techniques capable of separating supply and demand. In most of the studies, from the data or methodology employed, labor supply or demand cannot be statistically separated -- they under "unidentified" in the econometrician's terminology. Failing to recognize this has led to erroneous conclusions concerning the nature of demand or supply. One example of this overreaching the bounds of data and technique is the discussions of the turnover. The determinants of turnover are sometimes discussed using information on average ages. But observed average age of the labor force can tell us nothing about whether turnover is due to demand-side factors or supply-side factors. Several authors use such information to conclude that firms (demand-side) forcibly retire workers at a certain age. Yet quits (supply-side) can just as easily be responsible for turnover patterns. Clearly observed age distributions and turnover patterns arise from complex interactions between both demand and supply factors. This fundamental complexity must be explicitly recognized and incorporated into the conceptualization and methodology of the studies. Without this recognition, important potential problems, such as firms forcibly retiring female workers, cannot be understood or redressed.

Labor Market Outcomes - Many of the labor market issues raised concern observable phenomena that are labor market outcomes, deriving from the interaction of supply behavior by workers and demand behavior by firms. The issues I have discussed in Sections Two and Three that fall into this category include mobility patterns, turnover, absenteeism, the age distribution of workers, the health of workers, and issues concerning workers' wages. Additionally, many issues regarding the evolution of the EPZ labor market involve observations of labor market outcomes.

Supply and Demand for Labor - Recognizing that many of the topics studied are labor market outcomes usually does not take us very far. We are typically interested in analyzing these outcomes into their component parts in order to later influence or predict those outcomes. However, some central issues concern mostly one sets of agents: workers or firms -- supply or demand.

Supply - Many of the topics requiring study concern labor supply. These include human capital formation and labor market participation. Issues of labor force participation are ubiquitous in the discussion of women in the EPZ labor force. There has been a dramatic secular increase in the female participation rate in the Dominican Republic, while the male participation rate has slightly declined. We noted that the evidence suggests that women in the Dominican Republic EPZs -- unlike women in Asian EPZs or elsewhere in Latin America -- are often heads of households and have children, from which authors have often concluded that female participation is non-transitory. Yet little is understood about the causes and future trends of these secular changes in participation rates, or the permanence of women's attachment to the labor market. This is a vast, largely uncharted, area running from narrow short-run questions of how child care facilities would alter short-run female participation, to broad issues of how changing family size, family structure and social roles alter long-run labor force participation patterns. Participation issues, of course, border on many related issues such as labor turnover rates, absenteeism, worker patterns of investment in education, and even worker efficiency and effort on the job.

Schooling and training issues concern human capital formation, and hence short and long-run labor supply. Schooling and training issues are also tightly linked. Training has received significant attention in the literature, but the knowledge base on this subject is deficient. The principal issues concerning training are what kind of training is needed, and how best to provide that training. Somewhat surprisingly, in Section Two we saw that schooling is a crucial factor that EPZ firms demand of female production workers. Moreover, despite the excess supply of cheap labor in the Dominican Republic, it appears that there is a shortage of workers with adequate schooling, or alternative work experience. A large portion of the stock of labor willing to work in the Dominican Republic is 'unemployable' in the EPZs because of inadequate schooling. Thus it becomes crucial to devise training and schooling programs that transform this group of excluded workers into employable workers. To devise such programs we need to learn more about the role of schooling and the interrelationship between schooling and training. We do not know, for example, when and to what extent shorter-term training can alleviate the shortage of educated workers. Such information is required to evaluate the potential effectiveness of training programs, and -- at the implementation stage -- for the screening of workers into those programs. Further, no existing studies in the EPZ labor market literature examine the deeper issue of what it is about schooling that is useful to firms.

Given the low skill levels of the tasks, it is possible that schooling produces workers whose socialization is more to firms' liking; alternatively, it may be the cognitive skills acquired that are useful to firms. Answering these questions would aid in education and training policy geared towards EPZ expansion and export promotion.

Demand - The existing literature is riddled with vague, poorly reasoned claims about the important issue of labor market discrimination. Discrimination and occupational segmentation are issues that concern firm behavior, or demand. Labor market discrimination consists of firms treating equally productive workers differently; thus, it is a labor demand issue. Differential treatment may arise at the hiring stage, with some workers being guided into different occupations. This "steering" into occupations may lead to occupational segmentation. Other differences may consist of different levels of pay for equally productive workers. Differences may also consist of different promotional opportunities. Determining whether there is discrimination requires working with observations on labor market outcomes and trying to generate controlled experiments that allow us to discern whether firms are treating equally productive workers differently. The key is to have detailed micro-data on individual workers in order to make valid comparisons of "like" workers. The inability to control for worker characteristics invalidates simple comparisons of wages across groups of workers by sex, age, race, etc.. With good micro-data much can be learned regarding potential discrimination in hiring, wages and promotion. Without it, very little can be learned.

An issue of enormous practical importance for the EPZ labor market is whether firms forcibly retire women after some threshold age. As mentioned above, many authors have argued that this occurs. The evidence and widespread impressions are consistent with this claim. Yet very little is known about this truth of this claim, or -- if true -- its causes. Such forced retirement is sex discrimination by the firm, unless there is a decline in average female productivity near this threshold age. If there were a decline in average female productivity leading to a forced retirement policy applied to all women of a certain age, then forced retirement constitutes Age discrimination.

This issue of an age barrier urgently merits serious study. Careful methodology and good data are required to first determine whether firms behave in this fashion. Turnover rates, as discussed above, can just as easily reflect supply as demand factors. Moreover, if firms are behaving this way we need to understand whether it is prejudice that is at fault, or whether something leads to a sharp decline in female productivity after the threshold age. If it is discrimination, then education and legislation have be effective tools to get managers to voluntarily drop their

discriminatory behavior, or to force them from discrimination where education fails. If it is not discrimination, then the causes of the decline in female productivity must be investigated. Is it work conditions that demoralize and exhaust women after years in the EPZ production line? Is it the double burden of work conditions and demands from their reproductive and nurturing responsibilities that lead to lowered job productivity. And, if so, what policies affecting life in and outside the factory can be designed that will mitigate this drop in productivity. Policies leading to improved factory work conditions might help, and could even be profit maximizing for firms over the longer-run. Augmenting health, child-care, and related services to women might help, too.

The above policies pertain to combating the causes of forced retirement, and lessening its incidence. In addition, to the extent that forced retirement cannot be eliminated, study is urgently required to follow-up on the fate of women who are forcibly retired from the EPZ labor force. Since it appears that women in EPZs are often heads of households, with children and other dependents, and often the sole providers for these family members, forced retirement could have disastrous consequences for those women. We need to study what happens to these women, and how to assist their transition into other occupations outside the EPZs. Suggestions on how to assist these women could be derived from women who successfully make such transitions. Policies might involve credits for establishing businesses, or training in alternative occupations, job search or combinations of these.

Policies to Influence Labor Supply or Workers' Well-Being -- Many of the policies recommended in Section Three consist of providing services to workers. These services include child care, health care, food services and savings services. These policies are designed to augment worker productivity, or simply to increase workers' well-being. Worker productivity increases would occur via lowering absenteeism and turnover, or increasing worker alertness and motivation. These policies, and the training policies also recommended in the literature, are based on generally solid empirical evidence, and require careful feasibility studies. Ideally, these feasibility studies should be part of a broader program of investigation into EPZ labor market issues, since many of the issues involved in the provision of services related to underlying questions about workers and firms that should be addressed in studies of labor supply and demand, using survey data.

Broader Studies

Further research on the Latin America EPZ labor market should incorporate both the far more extensive literature on the more mature Asian EPZ experience and trade theory related to EPZ labor markets, that were beyond the scope of this review. The Asian experience may provide both better micro-data with which to get at detailed questions about the underlying supply and demand questions I have outlined, and it should offer far more information on the evolution of EPZ firms and labor markets. In theory, the Mexican maquiladora experience could also provide similar information on evolutionary patterns -- some of which was discussed above --, though the existing research on this appears limited. Broader studies could also examine the relation of trade promotion policies in addition to EPZs and employment opportunities for women, perhaps comparing the employment implications of the different options.

Comparative studies of EPZ labor markets across countries offer numerous advantages. They allow us to examine diversity in EPZ policies and the overall environment; that diversity allows us to answer questions cannot be addressed in studies of individual countries in isolation. For example, Costa Rica subsidizes training, while the Dominican Republic does not. How successful is this policy? Has it increased the overall effective labor supply? Has it attracted extra investment in the EPZs? How has this training been designed with respect to financing, screening of workers by their education and other factors, etc..? Moreover, Costa Rica has much higher average educational attainment. How does this higher overall Costa Rican educational level alter the level of investment and occupational mix in Costa Rica?

Actual Studies

The optimal design of actual studies depends on the scope and resources available. Because of the extensive overlap in the different issues raised, then these studies ought to be integrated as much as possible to explicitly capitalize upon these complementarities. For example, the recommended feasibility studies would profit enormously from analysis of extensive survey data on such issues as the causes of absenteeism and turnover.

I strongly recommend that extensive surveys on the Latin America EPZs be undertaken, and that proper financing be made available to conduct serious analyses of these data sets. Both household and firm-level surveys

ought to be undertaken, with data collected on the firms and zones in which specific workers work. If firms allow access to their workers -- before or after work, or during breaks -- then firm level studies would be relatively cheap and enormously edifying. Secure guarantees of firm anonymity and clear explanations of the use of the data -- many of these studies should augment firm productivity -- would help attain access to firms. Such interviews of workers ought to be coordinated with interviews of foremen and managers in the firms. Sample sizes of both workers and firms must far exceed the tiny data sets previously gathered.

Though household surveys would be more expensive to generate, they would allow us to answer questions concerning labor force participation, mobility, alternative options for workers, etc., that would otherwise elude us. Such surveys could target EPZ issues, or address broader issues of the labor market consequences of various trade promotion policies.

Though the design of surveys should respond to differences in individual countries different countries, the similarities would far outweigh the differences. And, as discussed above, the increase in information from cross-country comparisons is enormous. Thus, there are increasing returns to research of this kind: costs decline and returns rise with the number of replications.

One further study that is needed is to evaluate the existing way in which general and census data on EPZ firms and employment is generated, and to carry-out a study that develops recommendations for implementing better data generation. Currently some of this data is collected by national statistical offices, some by the zones, and some by ad hoc censuses. The data is poor in the best of cases, and non-existent for most Latin American countries. Recommendations should consider realistic options ranging from firm reporting requirements, to zone requirements, to guidelines for national statistical agencies. Such recommendations ought also to consider non-labor market data that is currently lacking or sporadically collected.

Conclusion

Enough interest has been expressed in the labor market consequences of EPZs to generate several broad reviews of the literature, of which this is one. However, further reviews will be for naught until significant

resources are dedicated to basic research. Resources should be channeled to this research, to serious feasibility studies for the policy recommendations that have emerged from the existing reviews, and to their implementation.

1. Rudiger Dornbush, The Economist, May 4, 1991.

2. See, for example, Rhee, Yung Whee, Katharina Katterbach and Janette White (1990). "Free Trade Zones in Export Strategies", September 1990, Industry Development Division, Industry and Energy Department, Policy Research and External Affairs, World Bank: Washington, D.C.

3. In some countries, "special free zone" status is granted to individual factories allowing them to receive the benefits of EPZ status without physically transferring their operation to the zone. This might be the case for firms which, by the nature of their production process (agroindustrial) could not feasibly be located in the zone, or for exporters in existence when a EPZ law went into effect, which are granted "grandfather" privileges.

4. Under the New Free Zone Law in the Dominican Republic, exporters meeting certain criteria were given a 12 months period to apply for reclassification as "special free zones". In essence this converts the factory into a bonded manufacturing warehouse.

5. Interviews with local economists, Santo Domingo, April 12, 1991

6. Economic and Social Progress in Latin America, 1990 Report of the Interamerican Development Bank; Washington, D.C., pp.90-91

7. Sanchez Ugarte, Mr. (Undersecretary, SECOFI) "The Restructuring of the Mexican Economy", Business Week Seminar on Mexico, January 24-25, 1990, New York, New York

8. "Mexico is on the Move Again", Wall Street Journal, March 9, 1990, pA13

9. Sanchez Ugarte..

10. Dornbusch, Rudiger. "If Mexico Prospers, So Will We", Wall Street Journal, April 11, 1991

11. Caribbean Business, March 21, 1991, p. 25

12. Ibid. p. 7

13. The governments in Mexico and the U.S., however, are concerned about the environmental effects of the border industries, i.e. toxic waste. A new General Law for the Ecological Equilibrium and Ambience Protection was passed in March of 1988.

14. We met with CIPAF researchers in Santo Domingo in February 1991, and they agreed to prepare tabulations from 1990 data that includes women in free zones, however this data, but arrived too late to be incorporated into the current study.

15. This was partly due to her being circumscribed in the policy she could recommend: that it not involve outlays of monies, but only consist of recommendations to zone authorities or firms in the zones that AID might make. In general, the weak links to implementation of both studies appear to derive from limited funding.

16. It is likely that Joekes and Rodriguez are generally on target with this recommendation, but to legitimize and guide such a training proposal requires more information and analysis.

APPENDIX: STATISTICAL TABLES ON LATIN AMERICAN EPZs

1. GENERAL

2. DOMINICAN REPUBLIC

3. MEXICO (maquiladora)

STATISTICAL TABLES: GENERAL

GENERAL DATA APPENDIX

NOTE: Data definitions vary over time and across countries. See source, indicated by superscipts, for precise definitions. (Blanks indicate N.A.)

Country	Number EPZs					LINE 1: Employment Levels in EPZs					% Women in EPZs (of total EPZ employment)	DISTRIBUTION OF WOMEN: LINE 1: % Women in Total Labor Force LINE 2: % of Female Labor Force in Industry	
	1965 -69	1970 -74	1975 -79	1980 -84	1989	1975	1978	1982-83	1986	1989	1989	1970; 1970	1990; 1980
Dominican Republic	1	3	3	5	18[B]	6,953	22,272	51,231	110,000		70	10.9 11.9	15 7.6
Haiti		1	1	1	2[B]		40,000[G]	48,000[E]	40,000[J]	55,000[F]	60-70	46.6 7.6	41.6 8.1
Jamaica		1	1	1	7[B] 3[C]		1,000[G]	1,200[J]	8,000[D]	15,000[J]	90	42.5 10.0	45.7 8.8
Puerto Rico					1	481[D]	4,000[H]	4,000[H]	734[D]			10.0	8.8
Costa Rica				2	2[C]			12,000[E]	6,000[J]	4,500[J]		18.1 17.8	21.8 20.0
El Salvador		1	1	1	1	6,143[D]	2,900G	2,900[J]	2,079[J]	3,500[J]		20.4 18.4	25.1 18.2
Guatemala		1	1	1	2[B]			15[E] 600[H]	400[J]	400[J]		13.1 22.5	16.4 20.0
Honduras			1	1	5[B]		200[H]	1,300[J]	2,586[J]	3,000[L]	72[M]	14.2 26.3	18.8 30.2
Mexico***						74,676[D]	90,700[G]	130,049[E]	250,000[D]	400,000[H]	66	17.8 20.9	27.1 27.9
Nicaragua			1	1	1		5,000[G]					19.7 16.3	25.2 15.0
Panama**	1	1	1	1	1	1,300[D]	700[H]	250[E]	2,058[J]	12,000[J]		25.2 9.2	27.1 8.0
Brazil	1	1	1	1	1	27,650[D]	27,300[G]	60,000[D]	63,000[D]	137,000[C]		21.7 19.2	27.4 19.9
Chile			2	2	4[L]			600[J]	2,000[J]			22.4 23.4	28.5 16.4
Colombia			5	6	6 4[L]	5,600[D]	2,800[G]	3,700[J]	6,700[J]		41* (1983)	21.3 21.9	21.9 21.0
TOTAL:	3	9	18	23	51								

* Only the Barranquilla EPZ (employs 50% of the total)

	Exports of Manufactured Goods($M) (Nominal $ for Years Indicated) TOTAL 1980	EPZ (year)	Growth Rate of Domestic Manufacturing 1965-80	1980-88	Distribution of Product in EPZs (see E below) 1982-1983	(%)
Dominican Republic	166[H]	117.1[B] (1980) 735.3[B] (1989)	8.9	1.0	Apparel Electronics Footwear Cigars	32.6 9.5
Haiti		300[E] (1986)			Electronics Machinery Textiles Baseballs	67 10
Jamaica	611[H]	25[C] (1989)	.4	1.6	Animal Food Garments Food Processing (all #s: 1983)	50 27 23
Puerto Rico						
Costa Rica					Apparel Shoes	
El Salvador	255[H]	10[C] (1979)	4.6	.3	Electronics Garments	60 37
Guatemala	359[H]					
Honduras	102[H]		7.5	1.9	Garments Brassieres	
Mexico***	2,651[O] (1980) 9,907.8[O] (1987)	771.7[O] (1980) 1,572.5[O] (1987)	7.4	.2	Electronics (1983) Machinery Textile Furniture Chemicals Toys (see Mex table)	60[H]
Nicaragua	57[H]	207.5[C] (1981)	5.2	.6	Garments	
Panama	31[H]		4.7	.7	Apparel	
Brazil	7,770[H]		9.8	2.2	Electronics[H] Motorcycles Plywood Processing	
Chile	758[H]		.6	2.0		
Colombia	804[H]	30[H] (1980)	6.4	2.9	Textiles/Clothing Footwear Electronics Metal Products	46 3 10 23

Sources:

B "Las Zonas Francas Industriales en la Republica Dominicana." Lic. Justiciano Cabrera. El Exportador Dominicano, P. 43, No. 99, 1990.

C Diamond, Walter and Dorothy. "Tax Free Zones of the World." March 1991.

D Kreye, o., Heirichs, J., Frobel, F. "Export Processing Zones in Developing Countries: Results of a New Survey." Geneva, Switzerland: International Labour Organization.

E "Guidebook on Free Zones." Graduate School of the U.S.D.A. Internation Programs, 1984. Data from 1982-83. Product types are listed, though corresponding numbers are often lacking. Columns for individual countries do not necessarily sum to 100.

G "Export Processing Zones in Developing Countries: Implications for Trade and Industrialization Policies." New York: UNCTAD, 1985.

H Currie, Jean. "Export Processing in the 1980s" No. 190, London: The Economist Publications, 1985.

J Rhee, Y., Katterbach, K. and White, J. "Free Trade Zones in Export Strategies." World Bank, Industry Development Division, 1990.

L Service Group/Ernst and Young. "Zone Contributions to Development." USAID/LAC/CDIE Workshop, Free Zone Paper #1.

M "Worker Rights in Export Processing Zones." US Department of Labor, Bureau of International Labor Affairs, 1990.

O "Worker Rights in Export Processing Zones: Mexico." US Department of Labor, Bureau of International Labor Affairs, 1990.

P "Economic and Social Progress in Latin America." IDB, Washington, DC: Johns Hopkins UP, 1990.

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STATISTICAL TABLES: MEXICO

Source: All tables for Mexican Maquila from "Workers Rights in Export Processing Zones", U.S. Department of Labor, 1989.

MEXICAN MAQUILADORA				
	Number of Firms	Number of People Emloyed	Annual change (%) in Number of Maquilas	Annual Change (%) in Employment
1975	454	67,214	0.0	12
1976	448	74,496	1	11
1977	443	78,433	1	5
1978	457	90,704	3	16
1979	540	111,365	18	23
1980	620	119,546	15	7
1981	605	130,973	2	10
1982	585	127,048	3	3
1983	600	150,867	3	19
1984	672	199,684	12	32
1985	760	211,968	13	6
1986	890	249,833	17	18
1987	1,125	305,253	26	22
1988	1396	369,489	25	21

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MEXICAN MAQUILADORA		
Number of Maquilas and Workers (1987) (Annual Average)		
State	# Maquilas	# Workers
Baja California Norte	458	59,635
Baja California Sur	12	509
Coahuila	74	19,356
Chichuahua	254	127,905
Jalisco	25	5,689
Mexico, D.F.	11	625
Nuevo Leon	22	2,479
Sonora	103	29,534
Tamaulipas	127	50,710
Others	39	8,802

MEXICO: Maquiladoras and Manufacturing Industries 1966-1987						
	GDP (in US $ Millions)			Employment (in thousands):		
	Maquiladoras "C"	Manufacturing Industries "B"	% (A as % B)	Maquiladoras "C"	Domestic Manufacturing Industries "D"	Maquila as % of Dom. Manu. ("C" as a % of "D")
1966	3.8	6,043.9	0.1	3.1		
1970	82.9	8,416.2	1.0	20.2	1,726	1.2
1975	239.8	11,844.6	2.0	67.2	2,002	3.4
1980	363.5	16,774.6	2.2	123.9	2,417	5.1
1981	417	17,946.1	2.3	131	2,542.5	5.2
1982	343.1	17,282.2	2.0	122.5	2,485.3	4.9
1983	319.8	16,162.1	2.0	173.1	2,309.7	7.5
1984	431.8	16,919.3	2.6	202	2,360.9	8.6
1985	483.8	17,925.2	2.7	217.5	2,343.5	8.9
1986	580.6	16,930.0	3.4	268.4	2,343.3	11.5
1987	692.2	16,591.4	4.2	325.0	2,266	14.3

MEXICO: Structure of Output and Mexican Value-Added in the Maquila Sector; 1984-1988 (in US$ Millions)					
	1984	1985	1986	1987	1988
Imported Materials	3,749.9	3,816.1	4,339.9	5,552.2	7,814.4
Mexico-V-A Total	1,160.7	1,265.8	1,295.8	1,635.4	2,339.5
Labor Costs	600.1	652.5	588.8	758.7	1,141.8
Locally Purchased Materials	50.5	34.6	51.0	86.6	132.0
Local Expenses	304.7	337.3	364.1	466.8	677.1
Profits and Misc.	205.4	241.1	291.6	323.3	388.6

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Mexico: Employment in Maquiladoras by Gender and Work				
	TOTAL LABOR: Manufacturing	Employment in Production		
		TOTAL	FEMALE	MALE
1975	67,214	57,850	45,275	12,575
1976	74,496	64,670	50,984	13,686
1977	78,433	68,187	53,188	14,999
1978	90,704	78,570	60,365	18,205
1979	111,365	95,818	73,837	21,981
1980	119,546	102,020	78,880	23,140
1981	130,973	110,684	85,691	24,993
1982	127,048	105,383	81,393	23,990
1983	150,867	125,278	93,274	32,004
1984	199,684	165,505	117,290	48,215
1985	211,968	173,874	120,042	53,832
1986	249,833	203,894	139,082	64,812
1987	305,253	248,638	164,103	84,535
1988	369,389	301,379	190,452	110,927

MEXICO: Percent of Total Employment Within Maquiladoras					
	Share of Total Workers			Share of Production Workers	
	Production	Technical	Administrative	Female	Male
1975	86	9	5	78	22
1976	87	8	5	79	21
1977	87	8	5	78	22
1978	87	8	5	77	23
1979	86	9	5	77	23
1980	85	9	5	77	23
1981	85	10	6	77	23
1982	83	11	7	27	23
1983	83	11	6	74	26
1984	83	11	6	71	29
1985	82	12	6	68	31
1986	82	12	6	69	31
1987	81	12	7	66	34
1988	82	12	6	63	37

MEXICO: Distribution of Workers by Gender and Industry (Domestic Labor) in Maquiladora						
Industrial Group	FEMALE		MALE		PRODUCTION WORKERS: as % of total labor	
	1980	1987	1980	1987	1980	1987
ALL Industries	77	66	23	34	85	81
Food Processing	73	77	27	23	90	88
Textiles & Apparel	84	79	16	21	90	85
Shoes & Leather	48	57	52	43	88	85
Furniture	12	28	88	72	88	80
Chemical Products	30	49	70	51	80	80
Transportation Equipment	68	53	32	47	84	82
Non-Electrical Equipment	32	33	68	67	84	82
Electrical Machinery	85	74	15	26	84	77
Electronics	80	72	20	28	84	80
Toys and Sporting Goods	86	73	14	27	90	80
Other Manufacturing	60	64	40	38	83	83
Services	88	76	12	24	91	91

STATISTICAL TABLES: DOMINICAN REPUBLIC

SOURCE: All tables for Dominican Republic from de Moya Espinal, Francisco, "Las Zonas Francas Industriales y las Empresas Multinacionales: Efectos Económicos e Impacto Sobre El Empleo en la República Dominicana", ILO, 1986.

DOMINICAN REPUBLIC TABLES

DOMINICAN REPUBLIC		
Total Number of EPZs	12	
Total Number of Firms	138	
Local Expenditure by EPZs (1984)	$60,475.20	
EXPORTS:		
	Domestic	EPZ
1975	893	27
1976	714	42
1977	778	62
1978	677	73
1979	872	94
1980	961	117
1981	189	136
1982	791	159
1983	811	184
1984	876	204

DOMINICAN REPUBLIC Employment Generated by EPZ	
1970	126
1971	740
1975	6701
1980	18,339
1985	30,737

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DOMINICAN REPUBLIC Foreign Exchange Generated by EPZ (in US$ Millions)	
1970	1,262
1971	2,951
1972	4,903
1973	4,622
1974	7,419
1975	12,839
1976	15,772
1977	23,872
1978	31,804
1979	37,295
1980	39,934
1981	58,151
1982	61,531
1983	61,850
1984	56,784

DOMINICAN REPUBLIC	
Unemployment Rates (%)	
1970	23.0
1973	20.0
1978	24.0
1979	19.3
1980	21.0 (Santo Domingo)
1980	13.0 (Santiago)
1984	24.8

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DOMINICAN REPUBLIC EPZ Employment by Industry and Gender (1985)				
	TOTAL	MEN	WOMEN	% Women
Fruit & Legumbres	663	199	464	70.3
Tobacco	2,126	556	1,570	73.9
Confeccion	18,842	5,107	13,735	72.9
Leather & Accessories	878	602	276	31.4
Footwear	2,856	960	1,896	66.4
Maps	25	23	2	8.0
Plastic Products	499	113	386	77.4
Glass Products	43	40	3	7.0
Machinery & Electronics	1,379	450	929	67.4
Professional & Scientific Equipment	839	401	438	52.2
Jewelry, etc.	1,613	1,240	373	23.1
Others	974	235	739	75.9

DOMINICAN REPUBLIC Employment by Gender (1985)				
	TOTAL	MEN	WOMEN	% WOMEN
TOTAL	30,737	9,926	20,811	67.7
La Romana	8,868	2,380	6,488	73.2
San Pedro	7,832	2,755	5,077	64.8
Puesto Plata	497	108	389	78.3
Santiago	12,200	4,302	7,898	64.7
Special EPZs	1,340	381	959	716

DOMINICAN REPUBLIC National Employment Percentages		
	MEN	WOMEN
1979	91.2	8.8
1983	90.1	9.9

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