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REGIONAL ECONOMIC DEVELOPMENT AND MAQUILADORA PRODUCTION:
AN INTEGRATED MODEL OF YUCATAN'S SPACE-ECONOMY

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REGIONAL ECONOMIC DEVELOPMENT AND *MAQUILADORA* PRODUCTION: AN INTEGRATED MODEL OF YUCATAN'S SPACE-ECONOMY

By

James John Biles

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ABSTRACT

REGIONAL ECONOMIC DEVELOPMENT AND *MAQUILADORA* PRODUCTION: AN INTEGRATED MODEL OF YUCATAN'S SPACE-ECONOMY

By

James John Biles

Maquiladoras are export-oriented assembly plants based on the labor-intensive manufacture of imported components. Traditionally, these firms have located along the U.S.-Mexico border. However, during the past decade *maquiladora* production has spread to other regions of Mexico. Perhaps the most dramatic shift in the location of these export-oriented industries has been experienced by the state of Yucatán. A decade ago, *maquiladora* production in Yucatán was insignificant; by early 2001, however, more than 145 export-oriented firms, employing more than 37,000 persons, generated more than $6 billion (US) in output. The majority of these firms produce clothing and apparel, primarily for the U.S. market.

The proliferation of *maquiladora* production in Yucatán is the consequence of profound changes in the global economy, as well as a series of national and regional economic development strategies implemented since the mid-1980s. In general, recent policy initiatives have identified *maquiladoras* as a "key" sector in redressing geographic disparities in economic development and bringing about a more equitable spatial distribution of economic opportunity in Yucatán.

Given the tremendous locational changes in *maquiladora* production during the past decade and the prevailing lack of integration of export-oriented industries with Mexico's economy, this dissertation provides a critical appraisal of export-oriented industrialization

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as a regional development strategy in the case of Yucatán, Mexico. An integrated input-output/spatial econometric model is developed and implemented in order to carry out policy analysis at different spatial scales. The model is a fully operational planning tool that may be employed for economic impact assessment and simulation in the case of Yucatán. Furthermore, the methodology upon which the model is based may be utilized to develop similar models for other locations.

In general, the input-output component of the model reveals that *maquiladora* production has had a positive impact on economic growth in both urban and rural regions of Yucatán. Furthermore, the EOI strategy has brought about a moderate redistribution of income at the regional scale (urban/rural) during the past decade. Spatial econometric analysis indicates that *maquiladora* production at the *municipio* scale creates additional employment not only locally, but among other locations throughout Yucatán. The propensity to generate "spillover" employment in other *municipios* is a function of both geographic distance and economic importance.

Notwithstanding the positive impacts of *maquiladora* production, the EOI strategy has not induced a more geographically-balanced distribution of economic development in Yucatán. The benefits of export-oriented industrialization have been highly concentrated at the local scale and employment creation effects are particularly weak among the highly impoverished and economically marginal *municipios* in the southernmost part of state.

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ACKNOWLEDGMENTS

Typically, dissertations and theses are prefaced by a trite, and usually superfluous, statement in which the student recognizes the support offered by friends, family members, professors, and colleagues. Such acknowledgments are invariably superfluous, at least in my opinion, because those providing assistance rarely expect public recognition. In a nutshell, one's appreciation should be shown not in black-and-white, but by one's actions.

This dissertation differs from most others. Had I desired to acknowledge those persons who played prominent roles in facilitating completion of my graduate studies and this research project, I would undoubtedly mention Prof. Bruce Pigozzi, my advisor, and committee members Assefa Mehretu, Robert Wittick and René Hinojosa. In addition, I would recognize the assistance provided by Mexican colleagues Juan Carlos González Avila and Roberto Vallejo. Most importantly, I would express my gratitude to my wife, Loly, and children, Alex and Monica, for enduring the sacrifices required to complete this dissertation.

Rather than profess public appreciation for the contributions of numerous persons who have no desire to see their names in print, I prefer to "acknowledge" my debt to the region that forms the focus of this dissertation – Yucatán, Mexico.

I was first introduced to Yucatán in 1985 as a participant in the Latin American Studies Semester at Temple University. As a young man from Bristol, PA who had never been outside the United States, the experience changed my life. In 1986, I dropped out of Temple to take up residence in Mérida, Yucatán for the next four years. Quite literally, it

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was in Yucatán where I grew up. I was enchanted by the region from the first time I visited and I remain so today.

The purpose of this preliminary statement, then, is to recognize the critical role that Yucatán has played in my personal and professional life. The research that follows represents an initial attempt at repaying the debt I owe Yucatán and its people, a debt that I am comitted to repay.

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Chapter One

INTRODUCTION

1.1 Statement of Problem

During the past two decades, Mexico has abandoned import-substitution industrialization (ISI) policies in favor of *maquiladora* production, a form of export-oriented industrialization (EOI) based on the labor-intensive manufacture of imported components (MacLachlan and Aguilar, 1998; Sagawe, 1996). Traditionally, these export-oriented firms have located along the U.S.-Mexico border. In 1990, for example, more than 90 percent of all *maquiladoras* and corresponding employment were found in border states. During the past decade, and especially since inception of the North American Free Trade Agreement (NAFTA) in 1994, export-oriented production has spread throughout other regions of the country. At present, more than 3600 *maquiladoras* employ more than 1.3 million persons throughout Mexico (INEGI, 2001). Although more than 70 percent of these assembly plants and 80 percent of all employment remain concentrated in the border region, almost 40 percent of *maquiladoras* established since 1990 (and one-third of resulting employment) are located in non-border states (INEGI, 2001).

Figure 1.1 Location of study area

At the regional scale, perhaps the most dramatic shift in *maquiladora* location has been experienced by the state of Yucatán (Figure 1.1 above). In 1990, only 13 *maquiladoras* employing about 2500 persons were operating in this marginal region of southeastern Mexico. By early 2001, however, more than 145 export-oriented firms provided direct employment to more than 37,300 persons (*Secretaría de Desarrollo Industrial*, 2001). A decade ago, virtually all *maquiladoras* were located in Mérida, the state capital. Today, however, the majority of employment in export-oriented production is found in rural areas of the state. About three-quarters of these plants produce clothing and apparel, primarily for markets in the United States. In a peripheral region such as Yucatán, with little indigenous industry, *maquiladoras* now represent about one-third of all manufacturing employment and almost two-thirds of total exports. Furthermore, the output of these 145 export-oriented firms is equivalent to almost 10 percent of all goods and services produce

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The explosive growth of *maquiladora* production in Yucatán has been fomented not only by profound changes in the global economy, but also as a consequence of a series of national and regional economic development policies implemented since the mid-1980s. The most recent of these initiatives, the ***1995-2001 State Development Plan***, seeks to achieve "balanced sustainable regional development" by channeling as much export-oriented production as possible to rural areas in order to generate employment and improve living conditions (*Estado de Yucatán*, 1996). In the case of Mexico, generally, and Yucatán, specifically, the *maquiladora* strategy certainly has generated employment and provided scarce foreign exchange earnings. However, the very nature of export-oriented production – importing virtually all intermediate inputs and exporting virtually all final production – constrains the potential linkages and overall economic impacts of such a development strategy. As a result, the EOI strategy has been widely criticized for its failure to integrate more fully with Mexico's economy (MacLachlan and Aguilar, 1998; Brannon and James, 1994; Pradilla, 1993).

1.2 Research problem

Given the tremendous locational changes in *maquiladora* production during the past decade and the prevailing lack of integration of export-oriented firms with the Mexican economy, this doctoral dissertation research project will provide a critical appraisal of EOI as a regional development strategy in the case of Yucatán, Mexico. Due to the rapid proliferation of export-oriented firms in Yucatán, the proposed study area offers a unique living laboratory in

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living laboratory in which to evaluate the potential consequences of the spread of *maquiladora* production to interior regions of the country. Furthermore, given the uneven economic relations that prevail between rural and urban areas of the state, the study will reveal patterns in the geographic distribution of economic impacts that are relevant not only for Yucatán, but also for other peripheral regions that adopt the EOI strategy as a means of promoting economic development.

1.3 Objectives, research questions and hypotheses

In a general sense, this study provides an empirical assessment of the local consequences of changes in the world economy. Paraphrasing Scott (1998), the dissertation analyzes the implications of policy efforts designed to maximize Yucatán's competitive advantages (low-cost labor and proximity to the U.S.) in an increasingly global mosaic of regional economies.

Specifically, the primary objective of the project is to understand more completely the interaction of global economic forces (proliferation of the EOI strategy) on sub-regionally embedded production and service systems (economic structure, employment and incomes) in Yucatán, Mexico (Vellinga, 2000). In the context of this study, analysis will focus on changes in urban and rural areas of the state and at the local (*municipio*) scale between 1990 and 2000. Furthermore, the study will assess the viability of the EOI strategy in the case of a peripheral region of a developing country with little indigenous manufacturing. In light of these objectives, the following research questions and working hypotheses will be addressed.

1.3.1 Research question 1

What is the overall impact of export-oriented industrialization on Yucatán's economy in terms of output, employment, and income? To date, the bulk of previous research has focused only on the direct effects of *maquiladora* production in terms of job creation and purchase of Mexican inputs (MacLachlan and Aguilar, 1998; García and Pérez; and Pradilla, 1993). However, according to Okuyama et al. (1999), in a regional context household consumption may have a far greater impact on economic outcomes than traditional backward or forward linkages among firms. Therefore, a more complete assessment of the EOI strategy may be obtained only if the indirect impacts of secondary purchases made by firms and households are considered.

With respect to associated hypotheses, it is expected that *maquiladoras* in Yucatán will have "non-trivial" effects on income, output and employment generation. This hypothesis will be tested by contrasting regional multipliers that incorporate the impact of *maquiladora* production with a "counterfactual" baseline analysis that excludes the presence of export-oriented production. Specifically, the contribution of *maquiladora* production to Yucatán's gross state product (GSP) from 1990 to 2000, as well as the impact of changes in *maquiladora* production on changes in GSP, will be quantified.

1.3.2 Research question 2

How do the economic impacts of *maquiladora* industries compare with those of domestic firms? According to Guajardo (1998), the overall impacts of export-oriented firms are about 50 percent smaller than those of domestic industries at the national level. Therefore, it is hypothesized that export-oriented industrialization in Yucatán has a more limited effect on job creation, income growth, and output than domestic manufacturing due to relatively weak forward and backward linkages. However, it is also expected that regional economies will become more economically self-sufficient over time due to structural change. Consequently, it is hypothesized that multipliers for both domestic firms and export-oriented industries will increase between 1990 and 2000.

1.3.3 Research question 3

What is the geographic distribution of these economic impacts within the state of Yucatán? In other words, given the recent proliferation of export-oriented production within rural areas of the state, what are the effects on rural areas and urban areas of Yucatán? Based on the classic literature on dependent development (Evans, 1979) and regional economic development (Friedmann, 1966) and the asymmetries that prevail between urban and rural regions in the developing world, the benefits of the EOI strategy are unlikely to be evenly distributed in the case of Yucatán.

In general, then, it is expected that the majority of direct economic impacts will be concentrated within rural areas of the state where most *maquiladora* employment is located. However, it is hypothesized that the bulk of indirect benefits will accrue to residents of Mérida, the state's urban core. Given the structural changes mentioned above, however, a greater and greater share of the indirect benefits is expected to remain within rural areas of Yucatán.

1.3.4 Research question 4

How strong is economic interaction within and between urban and rural areas (*municipios*) of Yucatán's economy? How do changes in *maquiladora* production impact upon these interdependencies? These research questions are concerned with the geographic extent of economic impacts, termed a "spatial multiplier" in the context of this study. Richardson (1985) was among the first to suggest the need to incorporate space into multiplier analysis. However, in the intervening decade and a half, only a handful of scholars have attempted to move from traditional sectoral multipliers to more dynamic geographic multipliers (Olfert and Stabler, 1999; Robinson, 1997).

Specifically, it is hypothesized that export-oriented industrialization in a given location will have positive effects on economic activity in surrounding locations in terms of job creation. In addition, these spatial multiplier impacts are expected to decline with distance and level in the central place hierarchy (economic importance) within the study area.

1.3.5 Research question 5

Is export-oriented industrialization a viable economic development strategy in the case of Yucatán? Specifically, what are the impacts of this strategy on regional development? This research question will be evaluated based on the impact of *maquiladora* production on economic growth (a necessary condition for development), inequality (distribution of income), and structural change. It is hypothesized that the *maquiladora* strategy is a catalyst for some degree of economic growth and structural change at the regional (urban/rural) level. However, as expressed in the previous research question, export-oriented industrialization is expected to increase regional income disparities. As a consequence, the general working hypothesis of this dissertation is that the form of EOI adopted in Yucatán is not a viable regional economic strategy.

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1.4 Expected results

This dissertation will result in the construction and implementation of an integrated model of Yucatán's space-economy. In the context of this study, the definition of the term "space-economy" follows Isard (1956) and Friedmann (1966). In general, Isard (1956) defines space-economy as the "spatial as well as dynamic character of interrelated economic processes." Given the objectives of this study, Friedmann's (1966) definition also remains particularly relevant – "...the economy in its spatial dimension, defined in terms of interacting flows of goods, capital, labor and information."

The model developed and implemented in subsequent chapters offers a relatively robust methodology to carry out policy analysis at different spatial scales in a developing country. In addition, model calibration is fairly straightforward and data demands may be met with limited survey data collection and incorporation of existing secondary data. The model is termed "integrated" because it links inter-regional input-output (IRIO) analysis and the spatial multiplier concept discussed above. In essence, the output of IRIO analysis (in the form of employment multipliers) becomes one of the primary inputs of the spatial multiplier model. By incorporating basic spatial econometric techniques, the model accounts not only for the linkages between different sectors of the state's economy, but also spillovers and interdependencies among Yucatán's 106 *municipios* (local scale). As indicated in Chapters Six and Seven, the integrated input-output/spatial econometric model is a fully operational planning tool, which may be employed for policy analysis and economic impact assessment in the case of Yucatán. Furthermore, the methodology upon which the model is based (Chapter Five) may be utilized to develop similar models for other locations.

1.5 Format of study

Export-oriented industrialization represents the most recent economic development strategy pursued by Latin American nations since independence in the 19th century. The following section (Chapter Two) operationalizes "regional economic development" as the term is applied in this study and provides an overview of the role of regional development policy.

Maquiladora production is a particularly Mexican manifestation of the export-oriented production strategy. Chapter Three begins with an overview of other economic development strategies followed by Mexico and many other Latin American nations. Subsequently, the chapter traces the general evolution of the Mexican *maquiladora* industry since inception in the 1960s. In addition, prominent locational changes since 1990 and the geographic distribution of economic impacts are assessed.

Chapter Four focuses on the recent proliferation of export-oriented firms in the study area – Yucatán, Mexico. This section identifies the historical and economic impetus and policy initiatives that have induced the rapid establishment of such firms in Yucatán. Furthermore, the direct economic implications of such a strategy are assessed.

In Chapter Five, an integrated model of Yucatán's space-economy, consisting of inter-regional input-output and spatial econometric components, is developed. The model is designed to facilitate identification of overall economic impacts, as well as the geographic implications of the EOI strategy at regional (urban/rural) and local (*municipio*) scales in Yucatán.

The results of the integrated model are presented in Chapter Six. A detailed assessment of the overall impacts of *maquiladora* production on Yucatán's economy between 1990 and 2

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Chapter Seven provides a formal evaluation of the research questions and working hypotheses introduced above. In addition, a detailed assessment of the viability of the EOI strategy is offered. Finally, several policy alternatives that may serve to optimize or increase the economic benefits of *maquiladora* production are discussed.

Chapter Two

REGIONAL ECONOMIC DEVELOPMENT AND REGIONAL POLICY

2.1 Defining "regional economic development"

As mentioned above, this dissertation serves as a formal assessment of export-oriented industrialization (EOI) as regional development policy in the case of Yucatán, Mexico. Before proceeding, therefore, it is necessary to operationalize the terms "region," "development," and "regional economic development as applied in this study." In addition, a general understanding of the process of regional economic development, as well as the role of regional policy, is required.

Although numerous examples of economic development policy analysis may be found in the contemporary literature, the vast majority of these studies have been carried out at national or international scales (for example, Farmer, 1999, and Barro, 1997). Within the geography and regional science literatures, regional income convergence/divergence has become the primary focus of much theoretical and applied work during the past decade (Rey and Montouri, 1999; Fujita and Hu, 2001). Nonetheless, these studies overlook assessment of income distribution at the regional level as defined below. In addition, con

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contemporary textbooks on development policy analysis (see Sadoulet and de Janvry, 1995, for an example) abdicate regional issues at the expense of national or sector-specific concerns. Furthermore, much of the recent scholarly work on economic development – both applied and theoretical – fails to provide a formal definition of the concept. Prominent examples of this shortcoming include Krugman's (1995) treatise on geography, development and economic theory and Haddad's (1999) analysis of regional disparities in Brazil.

Lack of a formal definition of "economic development" is troubling for (at least) two reasons. On the one hand, this oversight suggests that some tacit agreement or consensus exists regarding the meaning of the term. Judging from the wide variety of definitions that appear in the literature, however, the more likely case is that an explicit definition of economic development is lacking because no real agreement exists with respect to its meaning. To paraphrase Malecki (1991), the definition of economic growth is unambiguous, whereas development has meant almost all things to all people.

2.1.1 Defining "region"

Traditionally, geographers have defined regions: 1) on the basis of some social, economic or physical characteristic; 2) drawing on the concept of nodality – a functional relationship between the city and its hinterlands; or 3) based on administrative or political boundaries (Malecki, 1991). In these each of these instances, there is no premise that these regions represent the optimal division of space (Hewings, 1977).

Notwithstanding these (apparently) clear-cut definitions, the regional concept becomes murky because it has been applied at a variety of spatial scales, from the very

local to the international. In addition, regional boundaries are not static – they inevitably depend on the research problem in question and they may change over time as a result of geographic and economic forces (Friedmann, 1966).

In the context of this study, "region" is defined following Chisholm (1990) and Scott (1998). Chisholm (1990) identifies a region as an area within a nation that enjoys certain powers of government or administration. Scott (1998) offers a similar definition – a geographic area of sub-national extent characterized by some minimal level of metropolitan development together with an associated tract or hinterland. Chisholm (1990) also offers several salient differences between regional and national economies that are relevant to the analysis that follows:

1) a region has fewer powers than a national government;
2) consequently, policy instruments available to regional governments are fewer;
3) and, regional policy decisions tend to have limited effects on the nation;
4) however, national decisions have more profound effects on regions;
5) in addition, regional data, by comparison with national data, are limited or non-existent.

These distinctions are important because they reflect the limits of regional development policy and the limitations of regional development policy analysis. In general, regional policymakers have access to a relatively limited array of economic development tools. For example, state and local governments lack the ability to limit the volume of trade or movement of national citizens. In addition, with respect to policy analysis, it is often difficult to disentangle the effects of regional policies from those of national policies. Furthermore, regional policy analysis tends to be relatively less sophisticated than national policy analysis due to the dearth and limited quality of data.

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Consequently, regional economic models frequently must be derived from national data using *ad hoc* rules or mechanical techniques (Round, 1983).

2.1.2 Defining "economic development"

With respect to "development," Mabougunje's (1981) warning about the term's ambiguity remains relevant – in much of the literature, economic development is frequently confused with economic growth. A further complication arises because both words are often treated as synonymous with standard of living. Todaro (1997), for example, states that the "traditional" definition of economic development refers to the capacity of an economy to generate and sustain annual increases in aggregate income. Even a cursory perusal of the social sciences literature, however, reveals a stunning array of alternative definitions. Other connotations range from: increases in the quality of life associated with changes in the composition of population, quality and nature of local jobs, and quantity and prices of goods and services produced locally (Malecki, 1991); a process in which the potential of an organism is released to achieve its mature form or a more advanced state (Franko, 1999); change, improvement or progress in some direction (Smith, 1986); a reduction in absolute poverty, greater equality, equity and social stability (Sadoulet and de Janvry, 1995); use of the productive resources of society to improve living conditions of the poorest people (Peet and Hartwick, 1999); and a social scaffolding capable of sustaining effective networks of production and exchange based on the accumulation of physical and human capital (Scott, 1998).

Based on a synthesis of earlier work, Mabougunje (1981) identifies four interpretations of development: increases in per capita output (productivity); changes in the q-

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the quality of human capital; reduction of poverty and satisfaction of basic needs; and socio-economic transformation (production and consumption of "modern" goods and services). Mabougunje's synthesis forms the basis for the definition of economic development applied in this study. For the purposes of this dissertation, then, development is defined as a social and economic process consisting of three (interrelated) components: economic growth; greater equality in the distribution of income; and technological change. Each of these three components is discussed in greater detail below.

2.1.2.1 Development as economic growth

Economic growth may be defined as the expansion of income at a rate greater than population growth (Malecki, 1991). Typically, national accounts or other aggregate data are used to measure economic growth. However, growth does not necessarily lead to a qualitative improvement in welfare and, as such, is not a good measure of development (Malecki, 1991). As a case in point, the Mexican economy grew at an annual rate of more than seven percent between 1960 and 1970. However, poverty levels among the population (income accruing to the poorest 20 percent of the population) actually increased during this period (Panuco-Laguette and Szekley, 1996).

According to Chisholm (1990) and Peet and Hartwick (1999), growth consists solely of replicating existing economic structure – producing more of the same for everyone in the context of a lot more for a few. In other words, economic growth does not presuppose structural transformation of the regional economy. Consequently, development must incorporate far more than mere economic growth. As Mabougunje (1981) concludes, howev

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however, economic growth is certainly a necessary, though not sufficient, condition for development.

2.1.2.2 Development as greater equality

As implied above, the relative distribution of benefits constitutes another important distinction between simple economic growth and economic development. Inequality in Latin America and the developing world tends to be driven by initial endowments of natural resources and human capital (Franko, 1999). However, policymaking since independence in the 19^{th} century has brought about even greater levels of inequality (Franko, 1999). This uneven development or dualism (an economy in which the rich become richer and the poor more destitute) has been justified on the grounds of economic rationality. In fact, some scholars (for example, Kuznets, 1955; Myrdal, 1957; Hirschman, 1958; and Williamson, 1965) have identified increasing inequality as a likely (and perhaps necessary) consequence during the initial stages of development.

Kuznets (1955) hypothesized that inequality follows an inverted U-shaped path as economic development expands. An analogous model proposed by Alonzo (1980) suggests a "bell-shaped" pattern. In both cases, it is posited that disparities are likely to worsen during the early stages of economic growth. However, as economic development proceeds, inequality is expected to decline. This increasing inequality is attributed to structural changes that take place in the economy – growth may be concentrated in the industrial sector and regional income disparities may be exacerbated (Alonso, 1980). Ever the economist, Kuznets failed to consider space explicitly. However, the geographic ramifications of such a pattern of growth were obvious, at least to Friedmann (1966).

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According to Friedmann (1966), growth is a cumulative process that brings about shifts in existing spatial patterns. He affirms that industrial growth tends to be concentrated in one or two metropolitan regions, which results in a "center" of rapid, intensive development and a "periphery" whose economy is stagnant or declining. This pattern of geographically uneven development has also been suggested by Smith (1986) and Scott (1998), among others. Friedmann also asserts that the inter-regional terms of trade will continue to favor the center of rapid development as long as the periphery remains a producer chiefly of primary products and raw materials. Although Kuznets suggests that regional disparities will decline with economic development, he fails to provide any insights into the process(es) driving these eventual changes. In addition, empirical evidence of the hypothesized "Kuznets curve" has proven contradictory in both developed and developing countries (Todaro, 1997; Franko, 1999).

The relationship between inequality and development has also been expressed by the concepts of convergence and divergence (Williamson, 1965). In general, convergence refers to the decline in disparities associated with economic development; divergence indicates increasing inequality. In the economic geography and regional science literatures, two forms of convergence have received substantial attention during the past two decades. The first type of convergence, σ-convergence, refers to decreasing variation in regional incomes. Typically, the standard deviation or coefficient of variation is employed to analyze the distribution of income. The second form of convergence, β-convergence, occurs when per capita incomes in poor regions increase faster than incomes in wealthy regions. In general, econometric and spatial econometric models have been employed to test for this type of convergence (Rey and Montouri, 1999).

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Myrdal's and Hirschman's theories of development follow the modernization paradigm associated most closely with Rostow (1960), based on rapid industrialization and the transfer of an underemployed rural population to the productive urban sector (Hodder, 2000). Furthermore, both theories are predicated on the necessary existence of polarization – concentration of a very large share of economic activity in a small number of locations (Storper, 1991).

Myrdal's (1957) concept of cumulative and circular causation was gleaned from the experience of developing countries at the turn of the 20th century. He noted a tendency for the operation of market forces (trade between developed and developing nations, for example) to increase inequalities in incomes and productivity, contrary to classical economic theory (Friedmann, 1966; Higgins and Higgins, 1979). According to Myrdal, at the regional scale initial growth of certain locations is the result of historical accident. However, these economic advantages are self-reinforcing and concomitant with decline or stagnation in other areas. As economic development takes place, though, a process of polarization reversal is expected to occur. Polarization reversal refers to the redistribution of economic activity outside the central region into other areas, leading to convergence or the eventual decline in regional disparities (Storper, 1991).

Like Myrdal, Hirschman (1958) affirmed that trade can serve as an instrument of domination, rather than of mutual benefit (Farmer, 1999). In response, he introduced a development strategy based on the notion of "unbalanced growth" in which investment of scarce resources is concentrated in relatively few sectors (and regions) of the economy (Friedmann, 1966; Storper, 1991; and Franko, 1999). Hirschman's model of "controlled disequilibrium" targets initial investment to points of rapid urban industrial expansion

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(Friedmann, 1966). According to Dussel (1997), Hirschman believed that only a process of industrialization would be capable of attacking the bottlenecks to regional development and sustaining a process of economic transformation. The development of forward and backward linkages was proposed as the means of reducing imbalances and promoting development. Furthermore, Hirschman suggested establishment of new core regions in peripheral locations as a means of reducing disparities in regional economic development.

In each of the above cases, inequality is purportedly efficient for growth and distributional consequences are not relevant so long as the economy grows at a rapid pace (Friedmann and Weaver, 1979). However, as Peet and Hartwick (1999) state, economic development differs from economic growth in that it pays attention to conditions of production and social consequences, including distribution of incomes and human welfare. As Gilbert and Goodman (1976) assert, reduction of regional income differences, as well as integration of regions with the national economy, must be major goals of economic development policies.

2.1.2.3 Development as structural change

According to Franko (1999), the primary distinction between development and economic growth is that the latter presupposes technological (or structural) change. Technological change may be defined as the impact of technology on economic structure. Malecki (1991) asserts that these (qualitative) structural changes are more important than mere (quantitative) growth. Schumpeter (1934) distinguishes between growth as a process of gradual change and development as a process rapidly impelled by innovations.

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Friedmann and Weaver (1979) assert that economic development results in increasing specialization and greater interdependency (among different sectors, as well as regions, of the economy). This technical change is characterized by shifts in the mix of products, industries, firms and jobs that make up an economy (Malecki, 1991). As Pred (1966) affirms, the functions performed by a region change radically as economic development takes place. Therefore, the stage of development of any region should be evident in the industrial and occupational distribution of the labor force. Accordingly, as development proceeds, employment in agriculture and other extractive industries declines, while the share of employment in manufacturing and services rises. Subsequently, the share of employment in manufacturing declines and the service sector increases in importance (Chisholm, 1990). This structural change also consists of a qualitative change in technological skills of the population and the technological capabilities of firms and institutions, as well as increasing diversity and specialization of regional economies.

2.1.3 An operational definition of "regional economic development"

Based on the preliminary information above, regional economic development must contemplate the reduction of poverty, unemployment and inequality within the context of a growing economy (Todaro, 1997). Specifically, for the purposes of this dissertation, regional economic development is defined as a three-fold process consisting of the following components – growth in regional income at a rate greater than population change; increasing equity in the distribution of regional income; and structural change in composition of the regional economy. Although this definition is drawn from the literature cited above, it has been chosen for practical purposes – each of the three components is amenable to quantitative analysis.

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In general, growth in regional income may be assessed by comparing changes in gross state product with population growth between 1990 and 2000. In the case of Yucatán, two distributional issues are relevant – the region's overall contribution to national income and the distribution of income within the region. Structural change within the region may be assessed from a variety of perspectives. Possible measures include changes in employment, total output and productivity by sector, as well as changes in self-sufficiency and input-output technical coefficients by sector and region.

2.2 The process of regional economic development

Notwithstanding the detail of the previous sections, the definition of regional economic development is relatively straightforward. Defining and understanding the process of regional economic development, however, is a somewhat more complicated endeavor.

In general, two complementary bodies of theory exist with respect to regional economic development. During the past two or three decades, endogenous growth theories, in which savings and investment are the keys to self-sustaining economic growth, have become increasingly popular (Hartman and Seckler, 1967). Within the field of regional science, the seminal work of Tiebout (1956) provided initial impetus for the notion that endogenous forces, such as business and government investment and construction (migration), may serve as important determinants of regional income.

In contrast, export-base theories attribute regional economic growth to external demand for a region's goods and services. This export or "staples" model was initially proposed by North (1955) to describe the process by which regional economic development takes place. In the simple export-base model, regional and local markets are an

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too small to generate scale economies and other positive externalities. As a consequence, only significant external demand can generate the forward and backward linkages and increased division of labor necessary to promote development (Topik and Wells, 1998).

In the real world, both exogenous and endogenous factors coexist. In general, the importance of the export base in determining regional income depends on the size of the region – the larger the region, the smaller the role of exports. Therefore, notwithstanding the likelihood for endogenous growth, the export-based explanation of regional economic development has been reiterated by Friedmann (1966) and Malecki (1991) and will be the focus of this dissertation (Figure 2.1 below).

By their very nature, regional economies are open to the outside world and subject to external influence (Friedmann, 1966). As a consequence of this interdependency, the initial impulse for economic development usually comes from outside and is based on the combination of resources the region has to offer (comparative advantage).

According to Malecki (1991), regional economic growth is fundamentally a function of demand for a location's goods and services and a process of multiplier effects. Production and distribution of goods and services in response to external demand creates employment and income. This new economic activity expands the local economy through forward and backward linkages. Forward linkages refer to the sales of output to different sectors of the regional economy as intermediate inputs and final demand. Backward linkages correspond to purchases of intermediate inputs from different sectors of the regional economy. Ultimately, the size of the multiplier effect depends on regional economic structure. As mentioned above, increased forward and backward linkages may alter the region's occupational, and hence, economic structure (Pred, 1966).

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Consequently, promotion of greater forward and backward linkages represents a possible method of inducing structural change in regional economies.

The success of export-led development in the staples model is dependent on the existence of these linkage or spillover effects between export activities and the regional economy (Brannon and Baklanoff, 1987). Conversion of export sector growth, however, into regional economic development is not automatic. As Friedmann (1966) states, the success of an export-based development strategy depends on the socio-political structure of the region, as well as the distribution of income and pattern of expenditures. Socio-political structure refers (in part) to control of markets and factors of production. In extreme cases of external control, dependent development is likely to result.

Evans (1979) defines dependent development as a predicament in which one region's economic development is conditioned by the expansion of another region. Dependent development occurs when involvement in the global economy leads a region to specialize in the export of few products. As a result, local entrepreneurship is surpressed, investment in infrastructure is not undertaken, wages are kept to a minimum, and profits are taken out of the region (Friedmann, 1966).

In this case, the regional economy becomes disarticulated – firms must import their equipment and other capital goods. Consequently, increases in the output of the export sector do not feed back into the local economy and the purported multiplier effects and "spiral" of development associated with manufacturing do not take place (Evans, 1979).

According to Friedmann (1966), investment in the export sector must be converted into structural change – the "transformation of markets and productive facilities," in his w

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words – in order for regional economic development to take place. Promotion of these structural changes is one of the primary objectives of regional development policy.

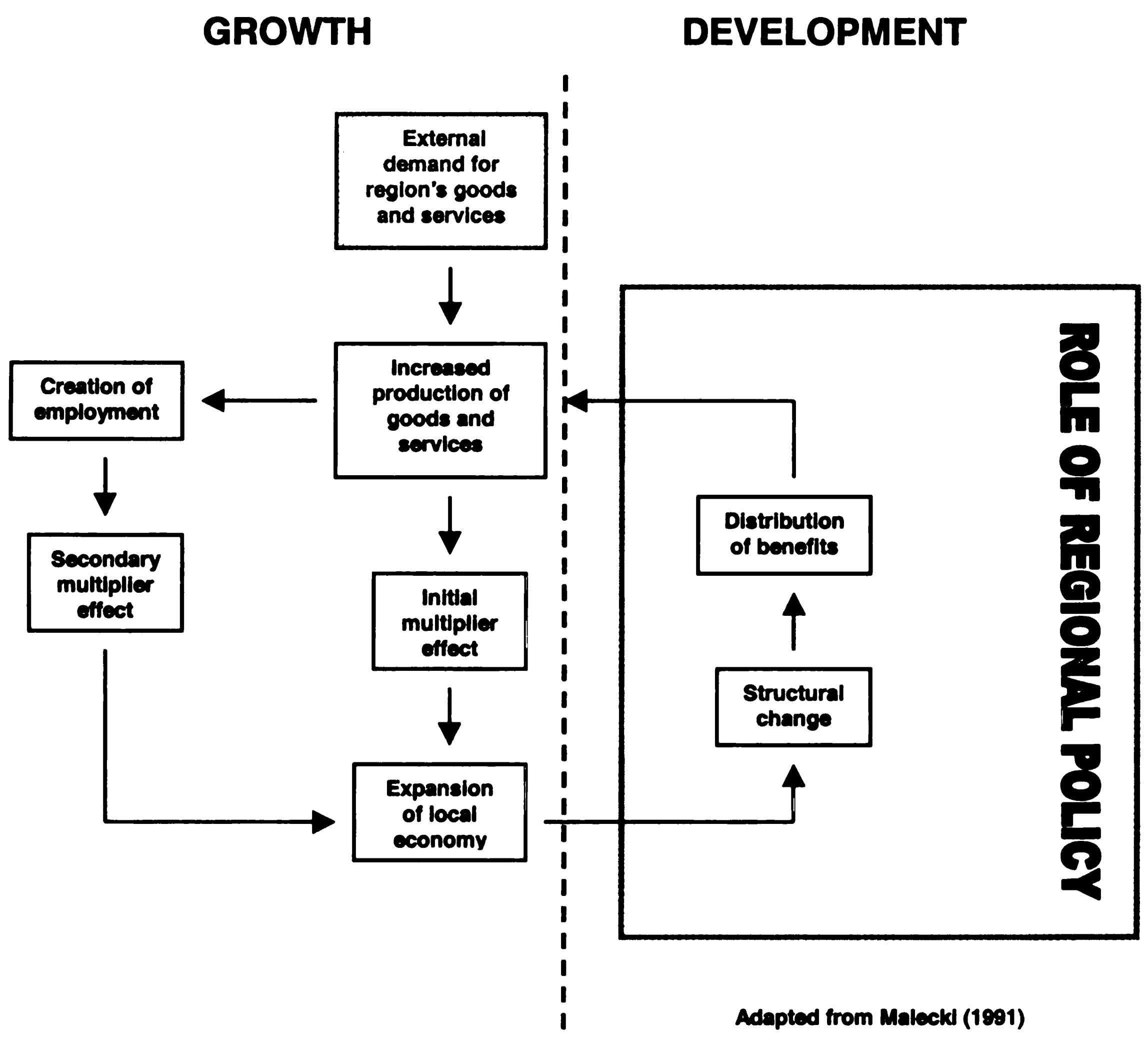

Figure 2.1 Regional economic development and the role of regional policy

2.3 Understanding the role of regional policy

Economic development is not driven solely by factor endowments or geographic variation in resources (comparative advantage), but also by economic policy (Franko, 1999). In fact, those economists ascribing to the "neo-classical" paradigm would assert that a substantial portion of (national) economic development since World War II has been the direct result of policy (trade liberalization is a case in point).

Some scholars contend that regional economic growth is essentially determined by national policies (Friedmann, 1966). Although national policy decisions, such as tariffs, interest rates, and subsidies certainly have important regional consequences (Biles and Pigozzi, 2000), such a statement is misleading. In fact, since many developing nations (such as Mexico) have no explicit regional policy at the national level, individual locations have no other recourse but to implement their own policies (OECD, 1997).

According to Friedmann (1966), regional policy deals with the locational aspects (the "where") of economic development. In similar fashion, Malecki (1991) asserts that regional policies are intended to alter geographically uneven development by creating a system of economic and spatial linkages simultaneously. This definition emphasizes the two primary roles ascribed to regional development policy in the context of this dissertation – facilitating structural change and assuring a more equitable geographic distribution of the benefits of economic growth within the region.

As shown in Figure 2.1 above, regional growth is comprised of a multiplier process in which exogenous forces generate demand for goods and services produced within a given region. This demand results in an initial multiplier effect as a consequence of increased output of inputs needed to meet external demand. In addition, the employment generated by external demand results in a secondary multiplier effect by way of household consumption. Both multiplier effects result in the expansion of the local economy.

If left simply to market forces, the benefits of these exogenous forces merely feed back into the local economy in the form of growth – expansion of aggregate output and

income. In addition, as discussed above, impacts typically will be concentrated both spatially and socially. Economic development, however, results only if regional policy or some other form of concerted intervention is employed to induce the qualitative changes mentioned above – structural change and a more equitable distribution of income and other benefits.

According to Miernyk (1965), structural change may include the appearance of new industries and the effects of technical change on the production process (as reflected in input-output technical coefficients). In the case of Yucatán, regional development policy addresses both forms of structural change. Objectives include promoting job creation and greater self-sufficiency in rural areas of the state, while diversifying the economy and improving productivity.

As mentioned above, the export-based model of economic development is likely to exacerbate disparities between rural and urban communities in the absence of regional policy. Friedmann (1966) confirms this, stating that the export of manufactured products from core areas tends to grow more rapidly than agricultural exports from the countryside. Although rapid growth of the urban core is expected to generate investment in surrounding rural areas (through the multiplier effect discussed above), regional policy is needed to achieve an optimal spatial distribution of the outcomes of the export-based model.

Frequently (as exemplified by Hirschman), regional policy options have focused on the choice between concentrated or balanced development strategies. According to Friedmann (1966), these options represent a false dichotomy. On the one hand, some redistribution of income and other benefits is necessary to promote economic

development in peripheral areas. On the other hand, the emphasis on balance creates conflict as any number of a host of different criteria may be chosen for the purposes of policy (income, investment, productivity, and output, for example).

In response, Friedmann (1966) proposes a "systems-wide" approach. He affirms the need to recognize that problems of economic development in different regions are "mutually contingent" on each other. Therefore, in order to be truly effective, regional policies must consider the impacts of economic transformation in all regions simultaneously. Consequently, Friedmann (1966) asserts that the ultimate objective of regional policy is to choose the optimal geographic location in which concentrated investment is likely to trigger the rapid expansion and full articulation of the space-economy. Though the integrated input-output/spatial econometric model proposed in this study is implemented in an *ex post* fashion, it also may be utilized in an *ex ante* fashion as suggested by Friedmann to evaluate the potential spatial implications of competing regional development policy decisions. Several hypothetical policy scenarios are assessed in Chapter Seven to demonstrate the utility of the integrated model as a regional economic development planning tool.

Chapter Three

AN ECONOMIC GEOGRAPHY OF MEXICO'S *MAQUILADORA* INDUSTRY

3.1 Economic development strategies in Mexico

Export-oriented industrialization (EOI) represents the most recent attempt to foster greater levels of development in third world nations. The *maquiladora* program is a particularly Mexican manifestation of the EOI strategy. According to Bulmer-Thomas (1994), the economic development strategies pursued by Mexico (and other Latin American nations) since independence fall into three general phases: "traditional" resource-based exports; import substitution industrialization (ISI); and export-oriented industrialization (EOI). This chapter offers a relatively brief overview of these development strategies, as well as a detailed assessment of the inception and the geographic and economic implications of Mexico's *maquiladora* industry.

3.1.1 Resource-based exports

Mexico and many other Latin American countries followed the traditional resource-based development policy until the first part of the 20th century. Upon independence in the early 19th century, these countries confronted a global economic system dominated by capitalism. One of the tenets of capitalism is the notion of comparative advantage.

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According to this theory (advanced by Ricardo), countries – and regions for that matter – should specialize in the economic activities in which they are most efficient. Furthermore, they should trade with each other on the basis of this comparative advantage in order to improve their overall welfare.

Since industrialized countries were purportedly more efficient in the production of manufactured goods, Mexico and other newly independent nations in Latin America chose to specialize in agricultural and resource-based products as a means of achieving greater levels of economic development (Sklair, 1993; Topik and Wells, 1998). Among the most common export items were mineral products (silver, tin and copper, for example), as well as agricultural commodities such as coffee, bananas and sugar. In general, economic development was expected to result from growth in commodity exports and the establishment of linkages between the export sector and the domestic economy. In theory, this greater integration with the world economy would also enhance productivity, bring about structural change and ultimately, result in higher levels of economic development (Bulmer-Thomas, 1994).

By the late 1800s, resource-based exports had become the consensus economic development strategy in Latin America – during the second half of the 19th century exports grew almost four percent annually throughout the region (Bulmer-Thomas, 1994). Overall, Latin American exports grew by 1000 percent between 1850 and 1913 (Topik and Wells, 1998). In the case of Mexico, exports grew by about three percent per year during the same period. Silver and copper, alone, comprised more than 40 percent of Mexico's total exports by the beginning of the 20th century (Bulmer-Thomas, 1994).

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By the 1920s, however, the resource-based strategy had been abandoned because it exacerbated structural problems inherited from the colonial period and created a host of new contradictions that inhibited the development of a productive market economy (Topik and Wells, 1998). In general, three (related) reasons are offered for the failure of the traditional export strategy – slow growth of internal markets; a reliance on single commodities and single markets; and the relative inelasticity of demand for primary products.

Since traditional resource-based policies were concerned with the needs of the export sector, countries did not invest adequately in their productive infrastructures and weak linkages existed between the export sector and the domestic economy (Franko, 1999). As a consequence, internal markets failed to grow and no substantial economic development took place (Bulmer-Thomas, 1994).

The emphasis on traditional exports also failed because countries tended to specialize in a single dominant commodity. As late as 1913, for example, one commodity accounted for more than 50 percent of exports in the majority of Latin American countries (Bulmer-Thomas, 1994). In extreme cases (such as that of Yucatán), a single commodity (henequen) comprised more than 90 percent of a region's total exports (Brannon and Baklanoff, 1987). Dependence on a single commodity export was an unstable basis for development as it exposed the domestic economy to violent shocks brought about by change in external demand (Topik and Wells, 1998). The strategy was exacerbated further by dependence on a single market (Franko, 1999). In the case of Mexico, for example, the United States accounted for three-quarters of its exports in 1913.[1] In Latin

[1] In passing, it should be noted that the U.S. now accounts for an even greater share of Mexico's imports and exports (approximately 80 percent).

America, exports to only four countries (the United States, United Kingdom, France and Germany) averaged almost 71 percent of total exports around the turn of the 20th century.

The resource-based development strategy also failed because primary products are relatively price and income inelastic. When prices decline (or incomes increase), demand for these commodities does not proportionately. Consequently, as world income grows, international demand for agricultural products does not keep pace. Demand for manufactured goods, on the other hand, is relatively income elastic – as incomes increase, demand increases at an even greater rate. Due to these declining terms of trade, demand for agricultural products did not keep up with demand for manufactures and the primary sector failed to serve as a catalyst for economic growth in Latin America (Franko, 1999).

As a result of these limitations, export pessimism – the belief that exports would not be the engine of growth – became prevalent by the early 1900s and the resource-based strategy was abandoned by Mexico and most other Latin American countries by the 1920s (Franko, 1999; Bulmer-Thomas, 1994).

3.1.2 Import-substitution industrialization (ISI)

In addition to the three reasons offered above, Mexico and its neighbors in Latin America abandoned the resource-based development model due to the turmoil in international markets during World War I and the Great Depression (Vellinga, 2000; Bulmer-Thomas, 1994). The Great Depression, in particular, created a great deal of instability in world commodity markets and left developing countries without stable markets for their products. Due to the dramatic decline in exports, Latin American countries were forced to reduce imports of manufactured goods from industrialized nations. Ultimately, countries such as Argentina, Brazil and Mexico sought to replace

manufactured imports with domestic production. This strategy eventually became known as import-substitution industrialization (ISI).

The formal ISI strategy, however, was not advocated and implemented until shortly after World War II. A group of policymakers at the United Nations Economic Commission on Latin America (ECLA) had made note of the robust economic growth of Latin America during the relative isolation of the World War II period. Led by Raúl Prebisch, these scholars, later known as the "dependency school," concluded that international capitalism was the primary cause of underdevelopment in Latin America. As such, they sought and established a theoretical basis for the import substitution strategy that had been (informally) adopted earlier by the larger nations of Latin America. The Prebisch-Singer theorem provided the theoretical basis for the ISI strategy (Dussel, 1997). This theory is based on the assumption that the elasticity of demand for primary products is relatively inelastic with respect to income. However, demand for manufactured goods is relatively elastic. Therefore, in the long-term countries that specialize in agricultural products and raw materials face a lower level of economic growth and a decline in their terms of trade.

Dependency theory is part of a long tradition of theoretical work that has viewed the primary obstacle to economic development in Latin America as unequal relations with foreign powers (Chisholm 1990). It views economic development as a "zero-sum" game in that underdevelopment is the result of the same process that produces economic development – the march of capitalism. Dependency theorists suggested that Latin American countries were not falling behind; they were being pushed behind by the exploitative development process in the powerful industrialized countries. Accordingly, the dependency school represents a rejection of the optimistic view of economic growth as an inevitable (internally induced) process advanced by Rostow (1960) and others during the post-war period. In other words, developing countries are not developed countries in the making. Rather, industrial countries have brought about underdevelopment in other nations in the process of economic expansion.

In order to explain the origin, persistence and exacerbation of dependency, Prebisch and his followers emphasized the unequal relations of exchange that prevail between developed nations (center) and less developed nations (periphery). These unequal relations are manifest in industrialized nations' access to cheap inputs through the extraction of resources, export of minerals, and exploitation of cheap labor in underdeveloped countries. According to dependency theorists, powerful industrial countries were draining developing nations of their wealth. Internal dynamism was lacking due to weak linkages between the export-oriented agricultural sector and the industrial sector. In addition, shifts in terms of trade provided a mechanism for systematic transfer of resources from poorer to richer countries (Chisholm, 1990).

Some dependency theorists argued that autonomous development was possible within the periphery. However, to move beyond dependent development, the state was identified as the "necessary" agent of change. According to Franko (1999), a powerful state acting in the national interest could counteract the unfettered operation of market forces and promote genuine development in the periphery. Consequently, the policy of import-substitution industrialization treats the state as the primary developmental actor.

Import-substitution was also predicated on the need for state intervention to correct the failures of domestic markets and the need for trade policy to transform the structure

of exports and domestic production. The strategy was based on two propositions – markets in Latin American countries were inefficient and the international trading system was biased against the products that Latin America exported (Weeks, 1996). The ISI strategy depends on the intervention of the state, as well as trade and industrial policies in order to achieve balanced growth, increase capital accumulation and increase private investment. The state also plays a critical role by protecting infant industries. According to Dussel (1997), the challenge is to integrate these industries with the national economy.

As conceived by dependency theorists, the ISI development strategy uses a variety of policy measures to encourage domestic production of manufactured goods previously supplied by imports (Cravey, 1998). ISI policies were designed to create domestic industries capable of producing substitutes for expensive imports while promoting industrial growth and the expansion of internal economies (Franko, 1999). Among other purported benefits, manufacturing would result in greater scale economies and achieve higher levels of efficiency (Dussel, 1997). The ISI strategy is premised on protecting internal markets and development of manufactured goods with greater elasticities (Dussel, 1997). Policy measures include high trade and non-trade barriers, tax incentives, subsidies, public credit, and provision of infrastructure (Dussel, 1997; Vellinga, 2000).

At first, the benefits of the import substitution strategy appeared substantial. By the end of World War II, Mexico, Brazil and Argentina had all established a role as exporters of manufactured goods (Sklair, 1993). During the war years, manufacturing grew at an annual rate of 5.7 percent throughout Latin American and 9.4 percent in Mexico. In general, the Mexican economy grew at 5.6 percent a year between 1950 and 1960 and 7.1 percent annually from 1961 to 1970 (Bulmer-Thomas, 1994).

In Mexico, import substitution was in place from about 1930 to 1976 (Cravey, 1998). As several scholars have noted, the ISI strategy induced the dramatic growth of the country's industrial core in the Mexico City region (Sklair, 1993; Hanson, 1994; and Cravey, 1998). By the time the strategy was abandoned, Mexico City alone accounted for about 13 percent of total population and more than 25 percent of gross national product.

The ISI strategy ultimately failed for several reasons. As competition from imports vanished, pressure to improve quality and design of domestic production dissipated. Furthermore, instead of importing finished goods, countries began to rely heavily on imports of machinery and intermediate goods. In reality, substitution was not between domestic and imported goods. Rather, substitution occurred between imported finished goods and imported capital and intermediate goods (Sklair, 1993). Imports of intermediate and capital goods rose faster than imports of finished goods fell, causing balance of payment problems. In addition, ISI policies were implemented in the hopes of promoting domestic industrial development. By the time the strategy was abandoned, however, many ISI industries had fallen under the control of foreign-owned transnational companies (Dussel, 1997). Furthermore, as imports grew (and balance of payment problems worsened), exchange rates worked against exports. In addition, global interest rate hikes brought about a massive debt crisis in Latin America and consumption and investment imports could no longer be financed. Finally, balance of payments shocks driven by the oil crisis of the 1970s prompted export promotion to relieve current account pressures (Franko, 1999).

The ISI strategy did little to change the fundamental pattern of asset ownership in Latin America, reinforcing the dual economy and highly unequal pattern of growth

(Mabougunje, 1981; Franko, 1999). Furthermore, the protectionism of the ISI strategy had a negative impact on the allocation of resources, resulted in a new privileged urban class, and largely neglected poor, abandoned rural areas of Latin America (Dussel, 1997).

3.1.3 Export oriented industrialization (EOI)

The debt crisis of the 1980s brought about the end of the ISI strategy in Latin America. A need existed to generate a trade surplus in order to accommodate debt service payments (Bulmer-Thomas, 1996). As a consequence, new development strategies were adopted to shift resources back toward exports. Trade was liberalized and firms were forced to compete against imports (Bulmer-Thomas, 1994).

Inward-looking development was replaced with export-led growth; state intervention was replaced with market forces. In contrast with the resource-based export strategy of the 19th century, however, the new export-oriented focus emphasized the role of manufactures. The focus of the manufacturing sector was shifted from the domestic economy to the global economy because the small size of markets in developing countries limited the potential success of import substitution (Amara, 1994). The strategy was also favored and imposed (though structural adjustment programs) by multilateral agencies such as the IMF and World Bank. The shift to the EOI phase was accompanied by a set of related policy measures including trade liberalization, inflation stabilization, privatization of state-owned enterprises (Bulmer-Thomas, 1996; Dussel, 1997).

The concepts of the production chain and the product life-cycle are essential to understanding the justification of EOI (and ability of developing countries to adopt such as strategy). A production or commodity chain may be defined as transactionally linked sequence of business functions in which each stage adds value to the process of

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production of goods or services (Dicken, 1998). Typically, the stages of a basic production chain include procurement of materials, transformation, marketing and sales, distribution, and service.

The product life-cycle (PLC) is a model that describes the development of a product through a series of five stages – initial innovation, growth, maturity, decline and obsolescence (Dicken, 1998). Accordingly, at any given stage of the life-cycle, the product's requirements of labor, capital and technology will vary substantially (Malecki, 1991). By the maturity stage, the production process has become standardized and manufacturers are confronted with greater competition and diminishing profit margins. Furthermore, in order to maintain (or expand) its market share, a firm must continually innovate. Innovation may take a number of different forms, including development of new products, improvement of existing products, or reorganization of the production process in order to maintain the profitability of existing products.

At this point, the production chain and product life-cycle concepts converge. In essence, certain segments of the production chain and product life-cycle favor particular geographic locations. Starting in the 1950s, trans-national corporations (TNCs) began to divide production processes not just according to the traditional division of labor, but also in a geographical sense. Certain activities, such as unskilled and semi-skilled processing and assembly operations, were moved to plants abroad as a form of geographic hedging (Sklair, 1993). Furthermore, an additional impetus for "offshore assembly" was fostered by the need to maintain profitability – innovation within the PLC concept, then, could take the form of TNCs shifting production on a large scale overseas in order to reduce labor costs (Sklair, 1993).

From an alternative perspective, the EOI strategy was promoted because manufacturing purportedly possesses unique characteristics for economic growth – its potential for creation of value added, employment generation, technology transfer and productivity growth, for example. According to Dussel (1997), manufactured exports provide a greater source of demand for domestic inputs, and (as a result) generate greater income for internal consumption items. In addition, they provide a source of foreign exchange and facilitate additional imports of intermediate or capital goods needed to increase levels of production.

The export-oriented industrialization strategy was initiated in the 1950s and 1960s in a group of East Asian countries (South Korea, Hong Kong, Singapore and Taiwan) that eventually became known as the newly industrializing economies (NIEs). These countries adopted a development strategy based on import substitution, as well as promotion of manufactured exports (Sklair, 1993). In addition, national governments played a prominent role in guiding the economy and controlling the vulnerabilities of the external sector in order to maximize the benefits of trade.

The initial application of the EOI strategy in Latin America took place in Puerto Rico. Puerto Rico exploited its unique relationship with the U.S. and resorted to manufactured exports as the engine of growth by the 1950s. In the 1960s, responding to the success of manufactured exports in Southeast Asia, policymakers in Latin America began to take export promotion seriously (Bulmer-Thomas, 1994). The EOI strategy eventually adopted throughout Latin America during the 1980s, however, was not a carbon-copy of the policies implemented among the NIEs. Asian countries, for instance, had not been large-scale exporters of agricultural products and natural resources. Furthermore, the policy ref

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policy reforms of 1980s and 1990s were much more dramatic than those implemented by the NIEs in the 1960s and 1970s.

The movement from the state-led ISI strategy to export-oriented development has also had profound implications on the role of national governments. With the neo-liberal economic reforms of the 1980s, the state was "delegitimized" as the primary agent of economic change. Instead, following the neo-classical economic development doctrine, markets were viewed as the primary allocators of resources. Government spending was cut to maintain a fiscal balance and state-owned firms were privatized to promote efficiency. Tariffs were reduced, exposing firms to competition. The external sector was again seen as the engine of development (Franko, 1999).

In general, economic liberalization was expected to have positive effects on standards of living and bring about high growth rates and more efficient allocation of resources (Panuco-Laguette and Szekely, 1996). However, the neo-liberal policies that accompanied the shift to the EOI strategy are unconcerned with income equality and redistributive objectives in favor of rapid economic growth and higher levels of average per capita income (Gilbert and Goodman, 1976; Bulmer-Thomas, 1996). Consequently, divergence, either in terms of increased variation in regional incomes or growth of per capita income, is more likely than convergence. These distributional consequences are readily apparent in the case of Mexico – according to Panuco-Laguette and Szekely (1996), income received by the wealthiest five percent of the population increased from 24 percent to 29 percent during the initial stages of the EOI strategy (1984 to 1992).

According to Evans (1979), the ultimate consequence of export-oriented industrialization is the exclusion of most of the population from the potential benefits of industrializa

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industrialization. Although the export-oriented production was not adopted to improve equity, the reforms associated with such a strategy have non-neutral effects on income distribution and level of poverty (Bulmer-Thomas, 1996). Therefore, the export-oriented industrialization strategy is unlikely to reduce inequalities in the absence of government intervention.

According to Panuco-Laguette and Szekely (1996), Mexico's entry into GATT in 1986 was the first step towards formal adoption of the export-oriented strategy. The transition from ISI to the EOI strategy in Mexico has also been marked by a geographic shift in location of manufacturing from industrial core regions (Mexico City and Guadalajara) to the U.S.-Mexico border region (Cravey, 1998). As the following section indicates, these dramatic locational changes are attributable, at least partially, to the inception of the *maquiladora* program in the 1960s and (more importantly) adoption of the *maquiladora* strategy as the country's *de facto* regional development policy in the 1980s.

3.2 Introduction of the *maquiladora* strategy

As defined in Chapter One, a *maquiladora* (or *maquila*, for short) is an export-oriented assembly plant based on the labor-intensive manufacture of imported components. The word *maquiladora* is derived from the Spanish verb "*maquilar*" which means to mill or process. In practice, the term was used to refer to the portion of grain retained in exchange for milling (processing). The formal definition above highlights the three most important characteristics of *maquiladoras*. By their very nature, these firms export virtually all of their production. In addition, *maquiladoras* are typically concentrated in labor-intensive manufacturing activities, such as clothing and apparel assembly

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assembly and electronics industries. In general, "cheap" labor is the primary input. Furthermore, *maquiladoras* rely on a variety of subsidies and incentives allowing temporary import of virtually all inputs duty-free.

3.2.1 Impetus for the maquiladora program

The *maquiladora* strategy was conceived as an imitation of the export-oriented growth of the newly industrializing economies (NIEs) of East Asia (Cravey, 1998). However, from the Mexican perspective, the initial stimulus for the EOI strategy was the implementation of the Border Industrialization Program (BIP) in 1965. During World War II, labor shortages in the United States led to the implementation of the *Bracero* Program, allowing millions of Mexican laborers to enter the U.S. legally as seasonal workers (South, 1990). The program attracted large numbers of migrants to the border region and resulted in rapid population growth in border cities such as Tijuana, Mexicali, Juarez, Nuevo Laredo and Matamoros. In order to improve infrastructure in the border region, broaden its economic base, and promote integration of the border region with the national economy, the Mexican government initiated the National Border Program (PRONAF) in 1961 (South, 1990).

The Border Industrialization Program was Mexico's response to U.S. elimination of the *Bracero* Program in 1964, which affected almost 200,000 seasonal workers and their families. The primary objective of the BIP was to provide employment to seasonal workers who had migrated to the border region. Attracting labor-intensive U.S. manufacturers to the border region was envisioned as the means of generating jobs (South, 1990). The BIP subsidized construction of industrial parks and allowed foreign companies to own and operate factories in Mexico and import equipment and inputs duty-free if fi

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duty-free if final products were exported (Cravey, 1998). Initially, the BIP restricted such activity to a 20-kilometer strip along the U.S.-Mexico border.

The success of the *maquiladora* program was also facilitated by U.S. tariff provisions undertaken in the early 1960s in an effort to promote "offshore assembly" (South, 1990). Specifically, U.S. tariff items §806.30 and §807.00 permit duty-free entry of goods processed and assembled abroad. Import duties were assessed only on the value-added abroad. In essence, these reforms allowed U.S. firms to export components duty-free to Mexico (and export-processing zones in other countries), carry out assembly or processing abroad, and re-import the final product paying taxes only on value-added. Since only U.S.-made inputs are exempt from tariffs, enterprises have an incentive to minimize local purchases of goods and services. Consequently, value-added is comprised almost exclusively of the low wages paid to unskilled and semi-skilled workers in the host country. Needless to say, these practices have represented the major impediment to increasing integration between *maquiladoras* and the local economy (Gereffi, 2000).

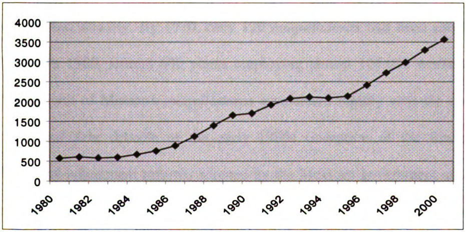

Figure 3.1 Number of *maquiladoras*, 1980-2000

The *maquiladora* program began as a regional development policy. However, by the early 1980s, it had become Mexico's de facto economic development strategy. By 1973, m

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most geographic restrictions on the location of *maquiladoras* had been eliminated (Sklair, 1993; South, 1990). In addition, national legislation enacted in 1983 encouraged location of *maquiladoras* outside of major manufacturing centers as a means of national industrial decentralization (Wilson and Kayne, 2000).

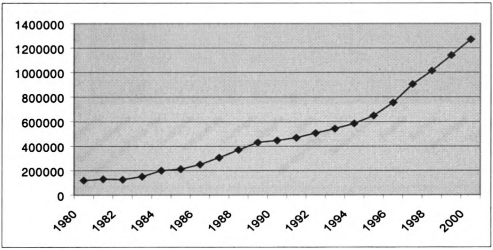

Figure 3.2 *Maquiladora* employment, 1980-2000

3.2.2 Economic impacts of maquiladora strategy

During the first couple of decades of its existence, the *maquiladora* program grew slowly, but steadily. By 1970, only 120 *maquiladoras* had been established (Galhardi, 1998). In 1980, around 600 plants employing almost 125,000 workers were operating. The growth of Mexico's *maquiladoras* accelerated rapidly with the country's economic crisis and debt debacle of the early 1980s (inception of the formal EOI strategy). Structural adjustment reforms adopted by the Mexican government at this time included reduction of trade barriers, privatization of state-owned enterprises, and dramatic currency devaluations. These reforms also resulted in lower real wages, a particularly important factor for the promotion of export-oriented development. As Figure 3.1 above indicates, the number of *maquiladoras* tripled between 1980 and 1990 (from 600 to more than 1

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than 1700) and more than doubled between 1990 and 2000 (from 1700 to more than 3500).

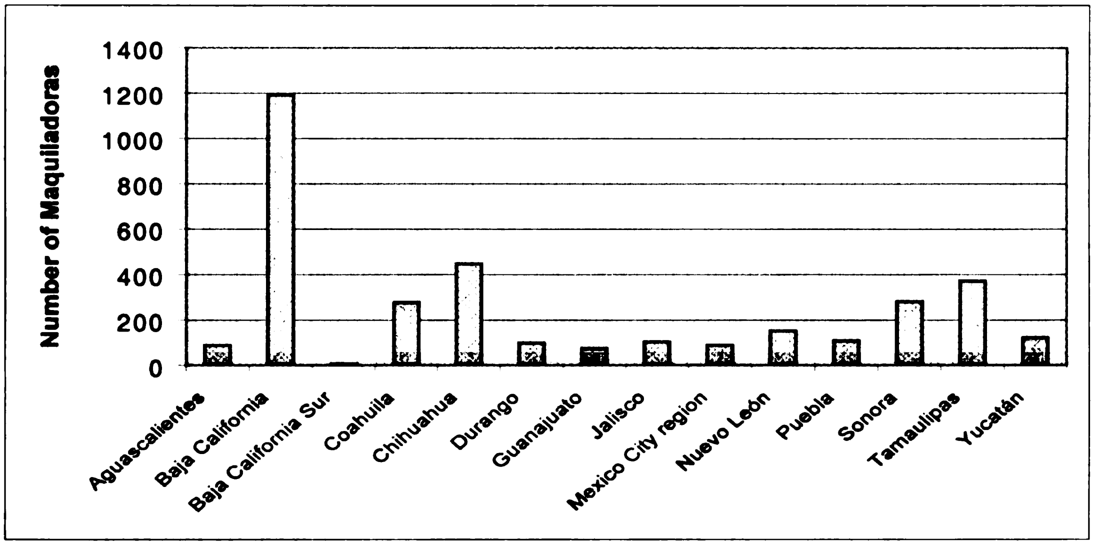

Figure 3.3 Distribution of *maquiladoras* by state, 2000

Currently more than 3600 export-oriented firms employ about 1.3 million Mexicans (Figure 3.2). More than 75 percent of all *maquiladoras* are located in border states, making the U.S.-Mexico border region the largest export-processing zone in the world. As a source of foreign exchange, *maquiladoras* are now more important to the Mexican economy than petroleum and tourism. Based on data provided by the *Instituto Nacional de Estadística, Geografía e Informática* (INEGI), these firms accounted for more than $60 billion (US) in output in 1999.[2] In addition, *maquiladoras* employed 26 percent of all industrial workers in Mexico and accounted for 68 percent of gross industrial product and one-half of total exports in 1998 (Vellinga, 2000). Figures 3.3 and 3.4 show the total number of *maquiladoras* and *maquila* employment by state, respectively.

[2] Unless otherwise stated, discussion of economic impacts **in this chapter** refers to U.S. dollars

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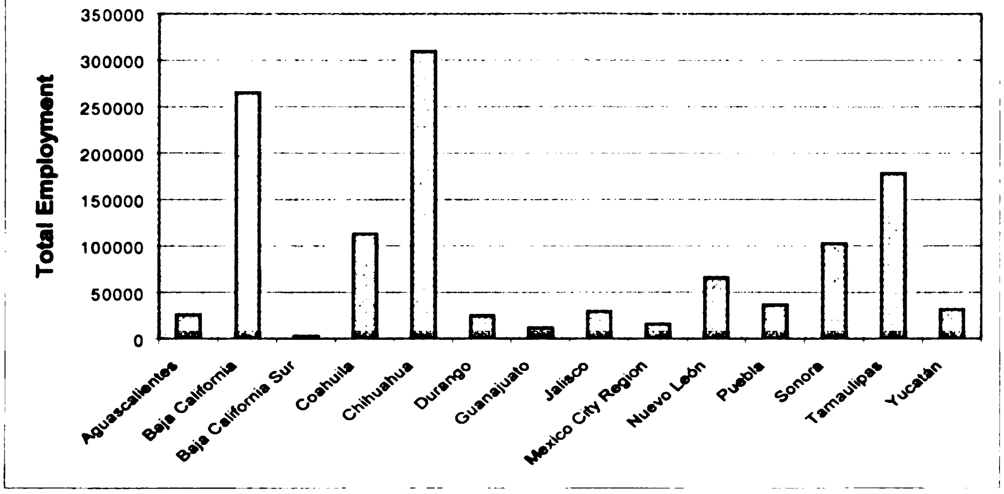

Figure 3.4 *Maquiladora* employment by state, 2000

In 1999, salaries of *maquiladora* employees comprised almost $7 billion (US). On average, salaries were about $7000 (US) annually. However, as Figure 3.5 below shows, a huge variation exists in wages among laborers and non-production workers (managers, technicians, etc.). Historically, production workers have earned about one-third as much as non-production workers. For example, the average laborer made less than $5000 in 1999, whereas the average non-production worker earned more than $19,000.

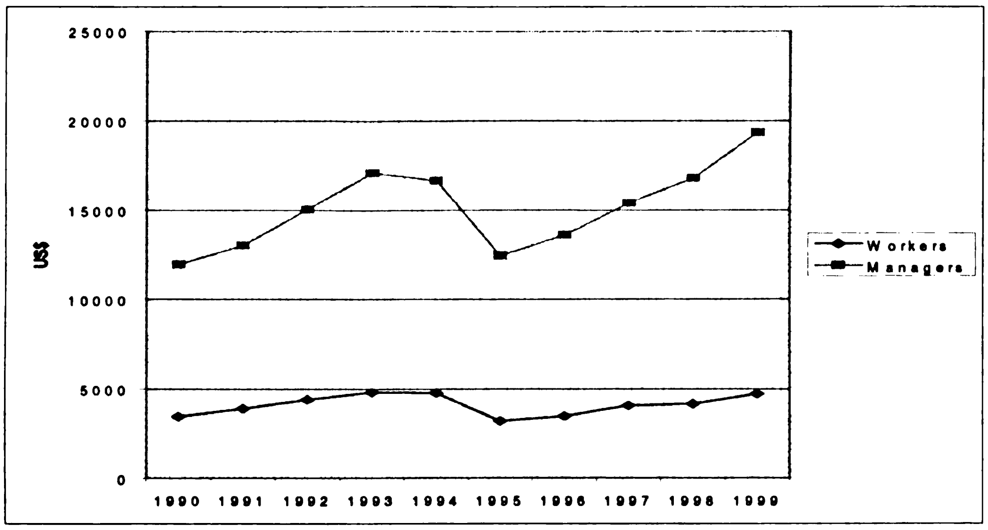

Figure 3.5 Annual *maquiladora* salaries, 1990-1999

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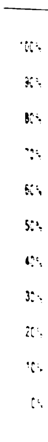

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The purchase of domestic inputs also has a significant impact on the Mexican economy. In 1999, sales of goods and services to *maquiladoras* totaled about $5 billion (INEGI, 2001). However, as many sources have documented, the purchase of Mexican inputs as a share of total inputs historically has been very limited. As Figure 3.6 below shows, purchase of Mexican goods and services averaged about 10 percent of total inputs between 1990 and 1999. However, the share of domestic content – purchases of goods and services within Mexico – appears to have declined slightly since inception of NAFTA in 1994.

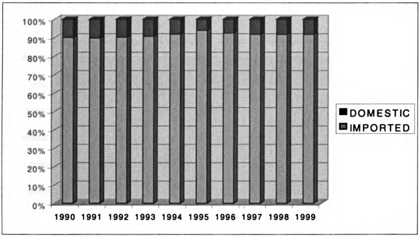

Figure 3.6 Mexican inputs as a share of total inputs

With one notable exception (Fuentes et al., 1993), previous studies have suggested that domestic content of *maquiladora* production amounts to only about two percent of total inputs (MacLachlan and Aguilar, 1998; Guajardo, 1998; Garcia and Pérez, 1996; Brannon and James, 1994; Carrillo, 1994; and Hanson, 1994). Although their study focuses on "material" inputs, Fuentes et al. (1993) included relationships with sub-contractors and supporting services among the backward linkages of export-oriented firms in Mexico. Other studies, however, have overlooked the importance of linkages betwee

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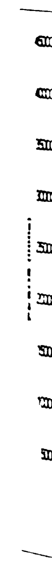

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between *maquiladoras* and local service industries that are essential for export-oriented production. These "producer services," including financial services and real estate, public utilities, wholesale and retail trade, transportation and communications, and personal and professional services, are consumed by firms as intermediate inputs in the production process (Malecki, 1991). The economic importance of "producer" services has been confirmed by Beyers (1992) and Hansen (1990), among others. Historically, the purchase of these services among Mexican *maquiladoras* far exceeds the value of domestic commodity inputs. As Figure 3.7 below confirms, between 1990 and 2000 their value averaged about three times that of commodity inputs (INEGI, 2001).

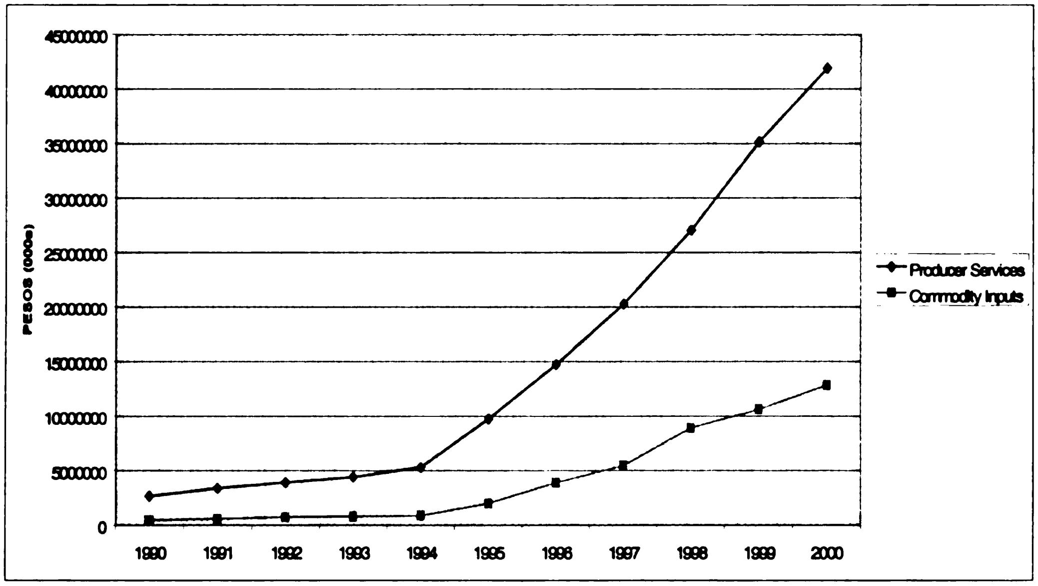

Figure 3.7 Purchase of commodity inputs and producer services, 1990-2000

A review of geography, regional science, and economics literatures reveals that only one scholar has quantified the indirect impacts of export-oriented production on Mexico's national economy. In general, Guajardo (1998) estimates that the economic effects of *maquiladoras* are more than 50 percent smaller than those of domestic firms. On average, every dollar of *maquiladora* production generates about 34 cents of additional output;

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every dollar of income produces another 15 cents in salaries and benefits. Based on Guajardo's estimated weighted output multiplier of 1.34, export-oriented firms accounted for almost three percent of Mexico's gross national product in 1999.

3.2.3 Geographic distribution of maquiladora impacts

Historically, *maquiladoras* have been concentrated in the U.S.- Mexico border region. The Border Industrialization Program discussed above provided the initial impetus for concentration of export-oriented firms in this region. The proximity to headquarters, "twin plants,"[3] and markets in the United States explains, to some degree, the continued clustering of *maquiladora* plants. Some scholars, however, have recently asserted that the geographic advantages of the border and poor quality of infrastructure within Mexico's interior will continue to reserve the economic advantages of the *maquila* industry for the country's northern border (OECD, 1997; Hanson, 1994).

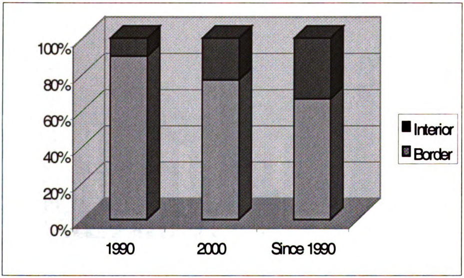

Figure 3.8 Location of *maquiladoras* by region

[3] Twin plants are assembly operations and input suppliers in the United States, frequently in close proximity to the U.S.-Mexico border, that coordinate production with *maquiladoras* in Mexico.

During the past decade, however, a fairly dramatic change has occurred in the location of these export-oriented production facilities. In 1980, more than 90 percent of all *maquiladoras* were located in Mexican border states (Figure 3.8). Although 75 percent of *maquiladoras* remain in this region, about 40 percent of plants established since 1990 are located in Mexico's interior. Shifts in individual *maquila* sectors are even more striking. For example, by 1992 almost 60 percent of employment in clothing and apparel *maquiladoras* was concentrated in non-border locations (Gereffi, 2000). The state of Yucatán represents perhaps the most dramatic example of this abrupt locational shift. As shown below in Figure 3.9, Yucatán (29 percent) and other interior states (23 percent), display the greatest rates of growth in *maquila* employment between 1991 and 2000. The case of Yucatán will be explored in depth in the next chapter.

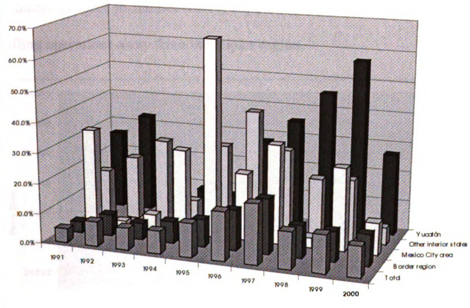

Figure 3.9 Change in *maquiladora* employment by region, 1991-2000

Several explanations have been offered for the recent changes in *maquiladora* location. Purported reasons include increasing negative externalities (congestion, pollution and crime, for example) in the border region. Other explanations are high turnover rates (greater than 100 percent in some industries/locations) and associated labor shortages.

Perhaps the most important reason for the shift of *maquiladora* production from the border region, though, are wage differentials. Historically, the Mexican government has maintained a three-tiered minimum wage system. The lowest salaries, approximately 30 percent less than those in Mexico City and the border region, are found in southern and southeastern states. As Figure 3.10 below reveals, similar disparities in *maquiladora* wages were apparent between border and interior regions between 1990 and 2000. In general, if wage differentials exceed the additional transportation costs and lower productivity rates in interior states, export-oriented firms will be acting "rationally" by shifting operations away from the border region.

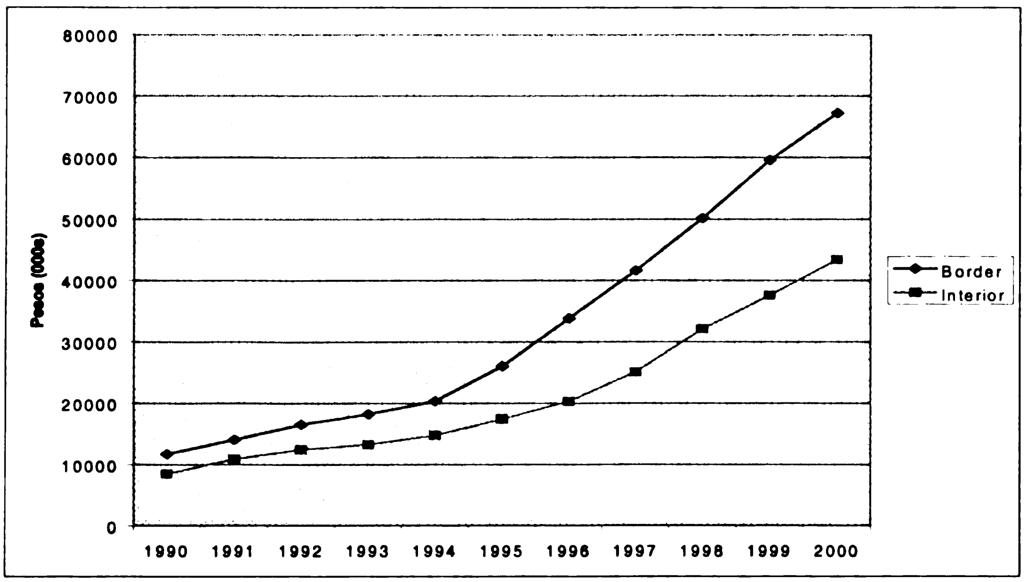

Figure 3.10 Average *maquiladora* wages in border and interior regions of Mexico

3.2.4 Locational shifts in maquila production

Shift-and-share analysis (SSA) provides a relatively simple method for assessing locational changes in *maquiladora* production. SSA decomposes these shifts, typically on the basis of readily available employment data, into three components: national growth (NS), industrial growth (IM), and regional growth (RS). National growth, also called national shift, corresponds to the overall change in economic growth between two time periods. Industrial growth, also termed industrial mix, identifies patterns of change in specific sectors of the economy relative to the national growth component. Regional growth, also referred to as the regional shift, indicates the extent of industrial growth in a particular location with respect to industrial growth at the national scale. The general formula for shift-and-share analysis may be expressed as follows:

$$\overset{R}{\underset{i\ (t+1)}{E}} = NS + IM + RS \tag{3.1}$$

where:
E refers to employment
R is a given region
i indicates the industry
t+1 refers to some future time period
NS accounts for national growth
IM refers to the industrial mix
RS indicates the regional shift

The computational formula is:

$$\overset{R}{\underset{i\ (t+1)}{E}} = \begin{bmatrix} \left(E_{N(t+1)} / E_{N(t)}\right) + \\ \left(E_{i\ (t+1)}^{N} / E_{i\ (t)}^{N} - E_{N(t+1)} / E_{N(t)}\right) + \\ \left(E_{i\ (t+1)}^{R} / E_{i\ (t)}^{R} - E_{i\ (t+1)}^{N} / E_{i\ (t)}^{N}\right) \end{bmatrix} * E_{i\ (t)}^{R} \tag{3.2}$$

where:
E, *R*, *i*, and *t+1* are as above
N refers to the nation
t indicates the present time period

In Tables 3.1 and 3.2 below, shift-and-share analysis has been utilized to assess changes in two of Mexico's most important *maquiladora* industries – metal products and clothing and apparel. Two time periods – pre-NAFTA (1990-1993) and post-NAFTA (1994-1998) – and two regions (border states and non-border states) are considered.

METAL PRODUCTS	1990-1993				1994-1998			
	NS	IM	RS	Total	NS	IM	RS	Total
Border	44959	-16401	-2553	26005	254770	-39621	-6315	208834
Interior	1151	-420	2553	3284	8384	-1304	6315	13395

Table 3.1. *Shift and share analysis of maquiladoras in metal products*

In the case of *maquiladoras* producing metal products, the vast majority of new jobs during both time periods were created in border states. Between 1990 and 1993, almost 90 percent of new jobs were created in the border region (26,005 of 29,289 jobs). During the post-NAFTA period, employment growth was even more concentrated among border states (94 percent of 222,229 jobs). However, as indicated by the industrial mix component (IM), employment growth in the metal products sector is inferior to average national growth of *maquiladora* employment during both time periods. Interestingly, though, a relatively pronounced shift appears to have taken place in regional comparative advantage between 1990 and 1998. During the pre-NAFTA period, a net shift of 2553 jobs takes place between the border region and interior. Between 1994 and 1998, a net shift of 6315 jobs results. In the pre-NAFTA period, the shift in comparative advantage represents almost nine percent of total jobs; in the post-NAFTA period it represents about three percent of employment.

TEXTILES INDUSTRIES	1990-1993				1994-1998			
	NS	IM	RS	Total	NS	IM	RS	Total
Border	7782	13926	-9151	12557	49070	44616	-26375	67311
Interior	2118	3791	9151	15060	26997	24547	26375	77919

Table 3.2. *Shift and share analysis of maquiladoras in textiles industries*

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Shift-and-share analysis also indicates that a large portion of the employment gains in clothing and apparel industries (during both time periods) is the result of overall national growth in *maquiladora* employment. In addition, the industrial mix component indicates that employment in clothing and apparel *maquiladoras* has increased at a substantially greater rate than overall national growth, suggesting some degree of comparative advantage in this sector. Results also indicate a fairly significant shift in regional comparative advantage (RS). During both time periods, the majority of new jobs are created among interior states. Furthermore, between 1990 and 1993 this shift in regional comparative advantage accounts for more than 60 percent of employment creation (9151 of 15060 jobs) in clothing and apparel *maquiladoras* in interior states. During the post-NAFTA period, the ongoing shift in regional comparative advantage from the border region to Mexico's interior is responsible for more than one-third of the new jobs (26,375 of 77,919 jobs).

Overall, then, shift-and-share analysis suggests that the locational changes in *maquiladora* employment are attributable, at least partially, to an ongoing shift in regional comparative advantage. Since export-oriented industrialization depends almost exclusively on low-wage Mexican labor, it is fair to conclude that wage differentials are among the primary driving forces of these locational changes.

3.2.5 Impact of NAFTA on export-oriented industries

Enactment of the North American Free Trade Agreement (NAFTA) in 1994 signifies disappearance of the formal *maquiladora* program in 2001 (Vellinga, 2000). However, some scholars assert that NAFTA represents a de facto expansion of the *maquila* strategy to the whole country (Kopinak, 1995; OECD, 1997). The most significant outcome of

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NAFTA is the eventual access that export-oriented firms will gain to Mexico's domestic market. On the one hand, NAFTA will permit increasing sales to Mexican consumers (Wilson and Kayne, 2000). In addition, U.S. customs provisions that discourage purchase of Mexican goods and services will be eliminated. As a result, NAFTA may actually strengthen forward and backward linkages between *maquiladoras* and the domestic economy.

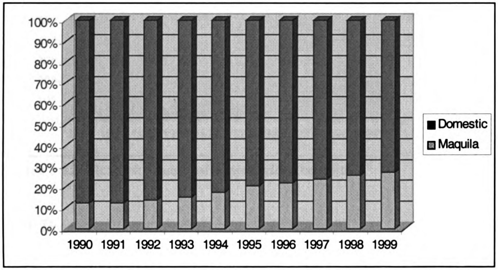

Figure 3.11 *Maquiladora* employment vs. total manufacturing employment

Another perspective on the impact of NAFTA has been offered by scholars such as Cravey (1998) and Kopinak (1995). Cravey asserts that the *maquiladora* regime was the model for NAFTA. In other words, she believes that the Mexican government has accepted the notion of export-oriented industrialization as the country's industrial development model. Kopinak has coined the term *maquilization* to refer to this scenario. *Maquilization* refers to the growth in the number of *maquiladora* plants and people employed in export-oriented industries as a proportion of the Mexican economy. The term also may be applied to describe the adoption of *maquiladora* characteristics by industries that are not legally *maquiladoras*. Evidence of this purported *maquilization*

may been seen in Figure 3.11 above. In less than a decade, *maquiladora* employment as a share of total manufacturing employment increased from 13 percent to more than 27 percent.

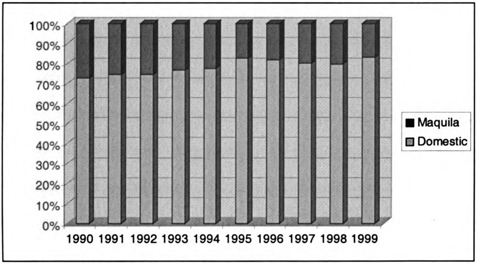

Figure 3.12 Mexican "share" of *maquiladora* benefits

3.2.6 The maquila strategy and regional development

As defined above, regional development must be defined to include economic growth (a necessary condition), reduction in regional income disparities, and structural transformation of the regional economy. Among previous researchers, only Sklair (1993) has attempted to assess the developmental implications of *maquiladora* production. Sklair identifies six criteria in order to assess the impact of the *maquila* strategy on development:

1) linkages between export-oriented firms and the Mexican economy;
2) retention of value-added within Mexico;
3) upgrading of human capital, as exemplified by greater employment of Mexican managers and technicians;
4) transfer of technology;
5) labor conditions;
6) distribution of costs and benefits between foreign investors, Mexican government and local population.

In general, Sklair concludes that the "developmental impacts" of the *maquila* strategy have been mixed. The policy has resulted in greater employment of "indigenous" managers and brought some prosperity to (urban) zones where firms have been established. With respect to working conditions, he asserts that export-oriented industries are no worse than domestic firms. However, the strategy has not brought about any substantial linkages with the domestic economy nor resulted in meaningful technology transfer. Furthermore, outcomes with respect to the "retention" of the benefits within the country are particularly disappointing. In 1980, value-added retained within Mexico amounted to about 44 percent of the value of imported inputs (Sklair, 1993). As Figure 3.12 above attests, the Mexican share of *maquiladora* benefits had fallen to about 30 percent in 1990. Moreover, by 1999 they had declined to less than 17 percent of imported inputs (INEGI, 2001).

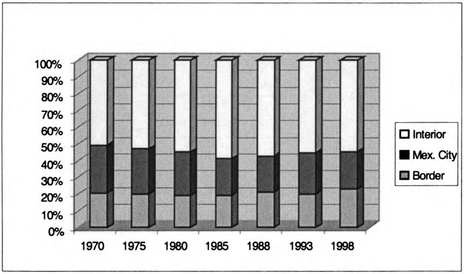

Figure 3.13 Distribution of income by region, 1970-1998

As a regional development strategy, it is also appropriate to assess the impacts of the *maquila* strategy on the regional distribution of income. In other words, since Mexico's *maquiladoras* historically have been concentrated in the border area and *maquiladoras* represent a significant share of Mexico's national income, the EOI strategy may have brought about a change in the distribution of income at the regional level.

Figure 3.13 above was derived from national accounts data. In general, this figure suggests that the income accruing to the country's core region – the Mexico City area – has declined from about 30 percent of the national total in 1970 to slightly more than 20 percent in 1998.[4] The share of national income corresponding to residents of the border region has averaged between 15 and 20 percent of the total between 1970 and 1998. Furthermore, a moderate increase in regional income appears to have taken place among border states since 1980. The most notable "change" in regional income is found among the states that comprise Mexico's interior. Between 1970 and 1985, this region's share of national income rose from 50 percent to about 60 percent of the total. However, since 1985 this share appears to have stagnated or fallen slightly.

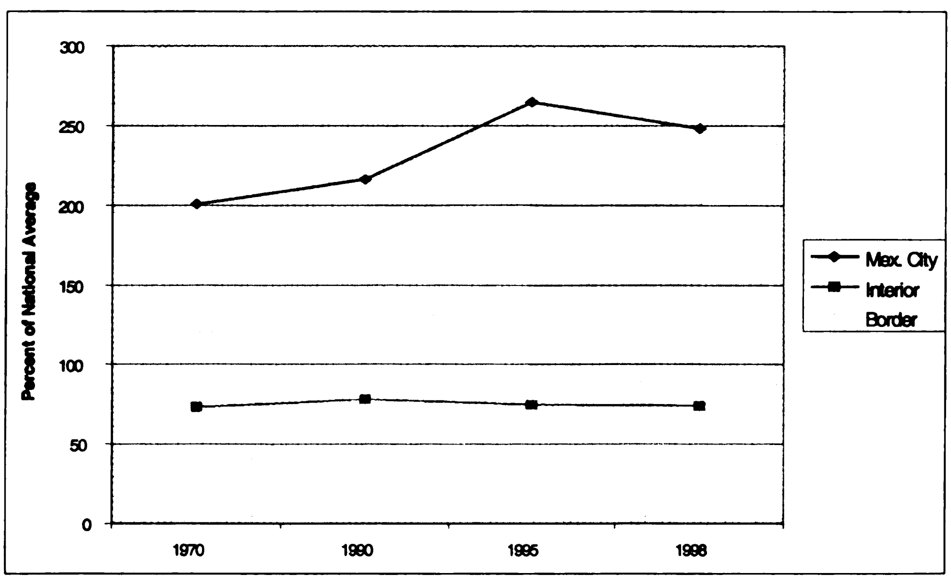

Figure 3.14 Per capita income by region, 1970-1998

[4] The "Mexico City area" in this case is defined as the federal district (*Distrito Federal*). Unlike other studies, this region does not include the state of Mexico.

The data in Figure 3.13 are somewhat misleading. They are aggregate regional totals and do not account for population change between 1970 and 1998. Figure 3.14 above displays per capita income by region between 1970 and 1998. If regional population change is considered, income growth among interior states has remained stagnant during the past 30 years (about 75 percent of the national average). The border region displays a slight improvement in per capita income since 1995 (slightly more than 25 percent above average national income). Contrary to popular opinion, the concentration of income in the Mexico City region has not weakened greatly during the past three decades. Per capita incomes grew from about two times the national average in 1970 to more than 2.5 times by 1995. Although average incomes have fallen slightly since 1995, the average *capitalino* (resident of Mexico City) still earns almost 250 percent of the national average. Consequently, it appears that the purported dispersal or "deconcentration" of the Mexican economy during the past two or three decades is more the result of population growth than any real concrete changes in the distribution of income.

It is tempting to assert that the *maquiladora* strategy has not brought about a significant change in the regional distribution of income in Mexico. However, such a statement would be misleading. Although the regional income gap (at the national level) has not diminished during the past 30 years, we have no way of knowing how large these disparities would have been had the *maquila* strategy not been adopted. The methodology proposed and implemented in this dissertation, however, will facilitate analysis of the impacts of *maquiladora* production on the regional distribution of income within Yucatán between 1990 and 2000.

Chapter Four

MAQUILADORA PRODUCTION AS REGIONAL DEVELOPMENT STRATEGY IN YUCATAN, MEXICO

4.1 Background information

As Figure 1.1 reveals, the state of Yucatán, Mexico is located at the crown of the Yucatán Peninsula. At present, the state's population is slightly less than 1.7 million; about 40 percent of all inhabitants and more than one-half of total employment are concentrated in the capital city and *municipio* of Mérida (INEGI, 2000). Locations that are peripheral geographically also tend to be peripheral economically and Yucatán is no exception. In 1996, Yucatán's gross state product per capita was slightly more than $2300 (US), less than 75 percent of the national average. Additional evidence of the state's marginality may be found in its below average literacy rate (85 percent) and poor average levels of educational attainment (approximately six years). Based on these and other socio-economic data, Mexico's *Consejo Nacional de Población* identified Yucatán as one of 15 states with high or very high levels of marginality in 1990.[1] In 1995, Yucatán remained one of only 12 such states (CONAPO, 2001b).

[1] Variables used in calculating marginality rates included literacy and education levels, income, and quality of housing.

Not surprisingly, Yucatán also lacks a strong indigenous industrial presence. In 1996, for example, gross state product (GSP) in manufacturing comprised less than one percent of Mexico's total gross national product (GNP) in manufacturing. Notwithstanding the state's limited industrial base, Mérida is the regional center for goods and services for southern and southeastern Mexico; as a consequence, the city displays a relatively strong presence in wholesale and retail trade and other service industries (INEGI, 2001).

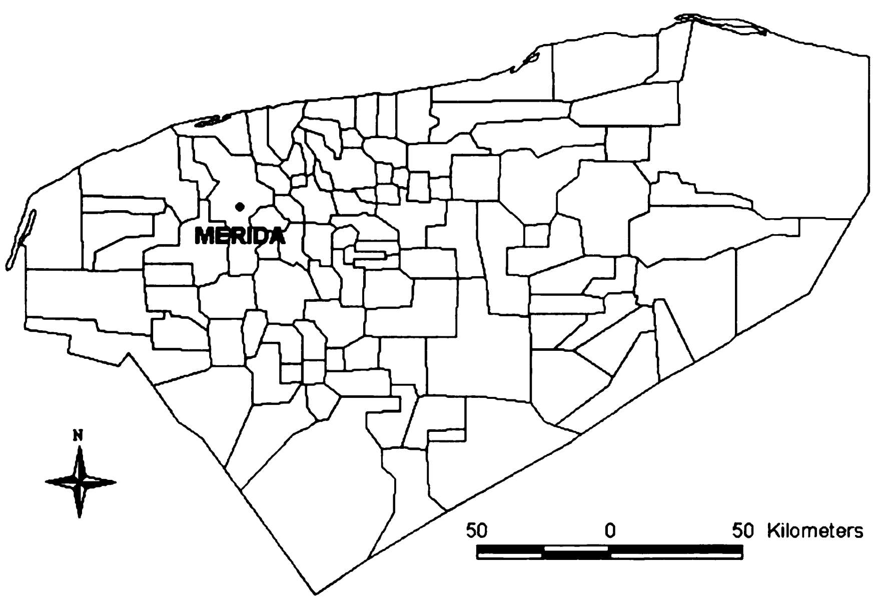

Figure 4.1 *Municipio* boundaries – State of Yucatán

As shown in Figure 4.1 above, the state of Yucatán is comprised of 106 *municipios*, roughly equivalent to U.S. counties. Large disparities in basic socio-economic measures may also be found at the local scale in Yucatán. For example, average literacy levels in rural areas (77 percent) lag far behind those in the state capital (95 percent). In addition, more than 50 percent of total employment and almost 80 percent of value-added in the state's economy is concentrated in the *municipio* of Mérida. As a consequence, 1996 per capita income averaged approximately $4400 (US) in the state capital and less than $1000 (US) in the rest of the state (INEGI, 2001).

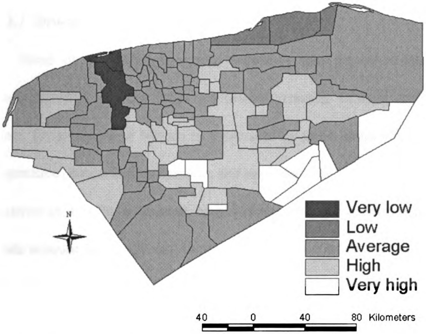

Figure 4.2 Level of marginality at *municipio* level (1995)

The CONAPO study mentioned above revealed that only one *municipio* (Mérida) in Yucatán displayed very low levels of marginality in 1990 (CONAPO, 2001a). Seventy locations, representing almost 30 percent of the state's population, however, were subject to high or very high levels of marginality. Based on 1995 data, CONAPO identified two *municipios* with very low levels of marginality (Mérida and the neighboring port of Progreso). A substantial decrease, however, was apparent in the number of locations exhibiting the highest levels of marginality. Only 38 *municipios*, accounting for about 15 percent of Yucatán's total population, displayed high or very high levels of marginality in 1995 (CONAPO, 2001b). Somewhat troubling, however, is that the number of *municipios* exhibiting very high levels of marginality increased from two to eight during this time. The map of 1995 marginality levels for Yucatán is found above in Figure 4.2.

4.1.1 Structure of regional economy

Some of the differences and disparities that prevail within Yucatán are further exemplified by the differences in economic structure between urban and rural areas of the state. Employment in Mérida is dominated by three sectors (food and textiles products, commerce, hotels and restaurants, and other services) which account for more than three-quarters of all jobs. In general, employment in service industries and wholesale and retail trade account for almost two-thirds of employment in the state's urban core. In rural areas, the primary sector remains far and away the most prominent source of employment. However, some structural change occurred during the 1990s, as employment in agriculture and mining decreased by more than 30 percent (in relative terms). In addition, service sector employment more than doubled in rural communities between 1993 and 1998. Also of note in the context of this dissertation is the substantial increase in the importance *maquiladora* employment in only five years. In 1993, export-oriented firms represented about two percent of all jobs. By 1998, these firms accounted for almost seven percent of employment in Mérida and nine percent in rural locations.

	1993		1998	
Sector	**Mérida**	**Rural**	**Mérida**	**Rural**
Agriculture and mining	3.7%	64.6%	2.4%	45.2%
Food and textile products	17.4%	8.5%	10.7%	11.9%
Other manufacturing	8.2%	2.9%	6.2%	1.7%
Construction	3.2%	0.8%	6.7%	1.9%
Commerce, hotels and restaurants	38.1%	16.1%	24.2%	13.3%
Other services	26.6%	6.3%	43%	17.4%
Maquiladora industries	2.7%	0.9%	6.8%	8.6%

Table 4.1 Structure of employment in Yucatán, 1993 and 1998

4.2 Historical precedents

Until the 1980s, Yucatán's economy was based on the production of a single agricultural commodity – henequen. Henequen is a natural fiber, indigenous to the region, used primarily to make rope and twine. Upon independence in the early 19th century, henequen production served a limited local demand for nets, sacks, hammocks and ropes. During the second half of the 1800s, production of henequen grew rapidly, first due to the demand for ship riggings, and subsequently as a result of the growth of mechanized agriculture in the United States (Wells, 1985; Brannon and Baklanoff, 1987).

Production of henequen expanded rapidly between 1880 and World War I due to the introduction of the McCormick reaper and the rapid expansion of grain production in the United States. With the financial backing of International Harvester, entrepreneurs in Yucatán developed an efficient system and necessary machinery for processing henequen fiber on a large scale and the region became the sole reliable source of henequen to supply demand (Chardon, 1963). After 1880, the United States (International Harvester, specifically) accounted for 90 percent of the state's henequen production (Brannon and Baklanoff, 1987; Topik and Wells, 1998). More than 85 percent of U.S. binder twine was manufactured with fiber from Yucatán (Wells, 1985).

By the turn of the 20th century, henequen production and processing occupied the dominant role in Yucatán's economy. During the 60-year "henequen boom," the crop comprised more than 95 percent of the region's exports and more than 70 percent of agricultural land was devoted to its production (Brannon and Baklanoff, 1987). Between 1870 and 1920, henequen comprised almost 20 percent of Mexico's total exports (Castilla, 1991). By the eve of the Mexican Revolution, Yucatán was exporting more than 100,000 tons of henequen fiber annually, making it Mexico's second most important export commodity following precious metals (Wells, 1985; Castilla, 1991). At this time, Yucatán had the largest share of its workforce employed in industry in all of Mexico. In contrast with most other plantation economies in Latin America, local entrepreneurs maintained control over land, physical capital, and local transportation infrastructure that were essential to henequen production (Brannon and Baklanoff, 1987). The state also had an indigenous industry of machine shops and foundries that built steam engines and machinery necessary to remove fiber from henequen plants. In the 1920s, a local cordage industry was established to manufacture twine, cables, and rope for domestic and U.S. markets (Brannon and Baklanoff, 1987).

The henequen boom transformed Yucatán from one of the poorest regions in Mexico to the most wealthy and industrialized state in the entire Republic in a span of only three decades (Wells, 1985; Topik and Wells, 1998). However, Yucatán's rapid economic growth was a textbook case of dependent development – the region's economic future was completely reliant on foreign investment and tied directly to a single foreign market (Evans, 1979; Wells, 1985). Furthermore, the henequen boom created social unrest as a local oligarchy (a group of 30 families known as *la casta divina*) emerged to control as much as 90 percent of total fiber production (Wells, 1985; Brannon and Baklanoff, 1987).

Similar disparities in the distribution of land and income existed throughout much of the country (*latifundia*), giving rise to the Mexican Revolution in 1910. As a consequence of the Revolution, more than 70 percent of henequen haciendas were expropriated and distributed to peasants in 1934. Cordage factories were eventually nationalized in 1964.

Although the failure of Yucatán's henequen industry is frequently blamed on the Mexican Revolution and break up of large estates, the ultimate explanation of its demise lies in its inability to generate sufficient linkages with the local economy. Yucatan's rail system provides a prime example – although almost 900 kilometers of rails moved henequen from the countryside to the port of Progreso and markets in the United States, secondary cities were not linked and Yucatán was not connected to the national railroad system until 1957. Furthermore, as Brannon and Baklanoff (1987) state, failure of Yucatán's henequen industry also resulted from its "operating outside the discipline of the market system and without the benefit of serious efforts to coordinate production and planning."

Although the importance of henequen to Yucatán's economy "peaked" in the first 25 years of the 20th century, the crop remained the region's primary economic activity until the 1970s. In 1970, more than 55 percent of the economically active population in the state remained employed in agriculture. At this time, henequen still represented more than 50 percent of farmed land and 60 percent of total agricultural production (Castilla, 1991; Baños, 1996). However, the introduction of synthetic fibers and emergence of new competitors in South America (Brazil), Africa (Kenya and Tanzania) and Asia (Philippines) brought about a dramatic decline in the region's henequen industry. By 1990, only one-quarter of the population was employed in agriculture and henequen represented less than 10 percent of total production (Baños, 1996). The most obvious result of the demise of the henequen industry has been its impact on unemployment levels in rural areas of Yucatán. For example, by 1990 only 42 percent of the working age population in rural areas was classified as "economically active" (INEGI, 1990).

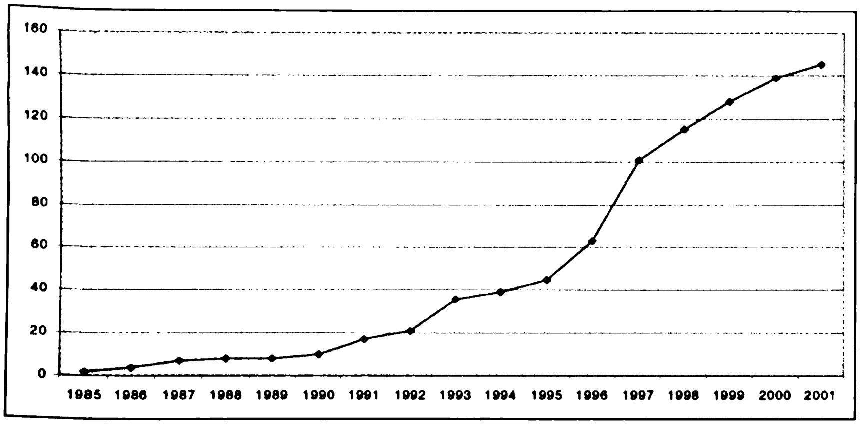

Figure 4.3 Number of *maquiladoras* in Yucatán, 1985-2001

4.3 Policy measures and political environment

In the 1980s, state and federal governments began to come to terms with the inevitable demise of the henequen industry. As a consequence, the ***Henequen Zone Restructuring Program*** was implemented in 1984 to "diversify" the regional economy and promote economic development by focusing on three key industries – tourism, fishing and *maquiladoras* (Wilson and Kayne, 2000). This policy, and the eventual privatization of the state-owned fiber processing plant (Cordemex) in 1990, provided the initial impetus for adoption of the EOI strategy. As displayed above in Figure 4.3, offshore producers responded rapidly; by 1988, ten *maquiladoras* had been established in Yucatán. In 1990, these export-oriented industries employed about 5000 people and were evenly distributed between clothing and apparel and "other manufacturing" plants.

The most recent policy initiative, the ***1995-2001 State Development Plan***, has played an even more important role in promoting the proliferation of export-oriented firms in Yucatán. According to Wilson and Kayne (2000), the rapid expansion of the *maquiladora* industry in Yucatán is "the result of a state policy to revitalize a declining local economy by reinserting it in the global economy on the basis of cheap manufacturing labor." As mentioned above, this policy seeks to redress disparities and achieve "balanced sustainable regional development" by channeling *maquiladora* production to rural areas of the state in order to generate employment and improve living conditions.

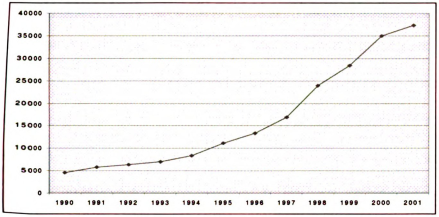

Figure 4.4 *Maquiladora* employment in Yucatán, 1990-2001

This policy identifies the excessive concentration of economic activity in Mérida as the primary cause of disparities in income, employment and economic opportunity in Yucatán. In addition, the plan seeks to redress the high levels of marginality that persist in many areas of the state (Estado de Yucatán, 1996).

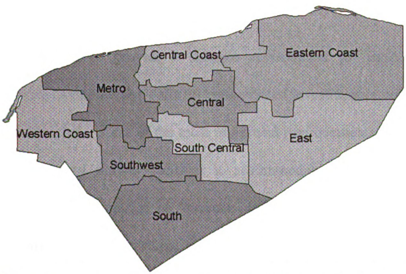

Figure 4.5 Regional planning districts, ***1995-2001 State Development Plan***

In response to these inequities, state government proposes to bring about a more equitable spatial distribution of employment by providing small cities with basic infrastructure to serve as growth poles and slow migration from the countryside to Mérida. The plan identifies the need to develop an effective method of regionalizing the state as an indispensable planning tool in achieving these objectives. The proposed regionalization scheme represents a traditional grouping of Yucatán's *municipios* based on historic, economic and other traditional linkages; economic activities of each region, including production, available resources, environmental conditions and socio-economic conditions. Figure 4.5 above identifies the nine planning districts established by the ***1995-2001 State Development Plan***. Table 4.2 below provides further detail about each region.

Name of region	Number of *municipios*	Population (1995)
Eastern coast	9	104,202
East	13	117,051
Central coast	17	83,896
Central	15	79,783
South central	7	43,224
Metro	14	873,078
Western coast	9	68,286
Southwest	14	87,986
South	8	112,304

Table 4.2 ***1995-2001 State Development Plan*** planning regions

In order to provide a suitable environment for export-oriented production, the development plan also calls for concentrated investment in order to enhance the quality of infrastructure. Some of the most prominent improvements carried out since 1995 include: expansion of runway facilities to accommodate larger planes; construction of a new airport in the interior of Yucatán; deepening the harbor at the port of Progreso to accommodate larger ships; construction of a gas pipeline from the coast to industrial parks; construction of a new electricity generating plant; expansion of existing highways; and expansion of industrial parks, especially in interior regions of the state.

Anecdotal evidence, gleaned from fieldwork in Yucatán, indicates that the policy initiatives and concentrated investment of the past decade have played an important role in attracting export-oriented firms to Yucatán. In addition to a favorable geographic location and low-cost labor, *maquiladora* representatives identified infrastructure enhancements and the stable social and political climate as important factors in their decision to locate in Yucatán. Notwithstanding recent policy initiatives, *maquiladora* representatives also recognized the importance of social capital – the role of personal relationships – in conducting business in Yucatán. Apparently, these personal relationships play an important role in locating qualified labor, gaining support of local government officials, and accessing needed resources.

4.4 Other incentives

From the perspective of trans-national corporations (TNCs), several other more "practical" considerations also make Yucatán an attractive setting for export-oriented production. The state boasts a fairly well-trained workforce; for example, by the time most women enter formal employment in *maquiladora* firms, they have had some experience in sewing, embroidery and weaving. A large pool of idle labor also contributes to the attractiveness of the state. As implied above, high levels of unemployment exist, particularly in rural areas, as a result of the collapse of the henequen industry. The existence of this "surplus labor" has played a significant role in depressing wages in the region and extremely low labor costs have been an especially important factor in the proliferation of export-oriented production. As Dicken (1998) observes, in the mid-1990s Yucatán displayed the lowest costs in the world per standard minute in the clothing and apparel industry.

In addition, workers in Yucatán are less politically organized and the "threat" of unionization is extremely limited (Wilson and Kayne, 2000). Furthermore, as mentioned in Chapter Three, Mexico continues to maintain a three-tiered minimum wage system; the lowest salaries, approximately 30 percent less than those in Mexico City and border states, are found in Yucatán and other southern and southeastern states. Finally, although peripheral to Mexico City, Yucatán is relatively well positioned with respect to Central America and the Caribbean (location of many other export-oriented production facilities) and the southern United States (origin of most intermediate inputs and destination of the vast majority of final production).

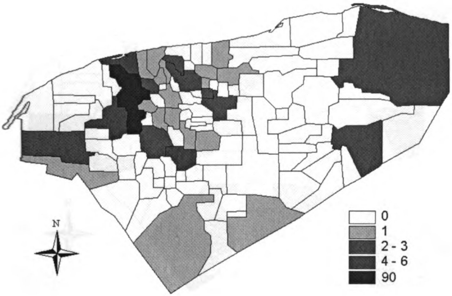

Figure 4.6 Number of *maquiladoras* by *municipio*, 2001

4.5 Proliferation of *maquiladoras* in Yucatán

As mentioned above, ten *maquiladoras*, employing approximately 2000 persons had been established in Yucatán by 1988. By early 2001, though, approximately 145 *maquiladoras* were in operation, employing more than 37,300 persons throughout the state (Figures 4.3 and 4.4). The vast majority of these plants produce clothing and apparel for markets in the United States (about 80 percent). Other prominent sectors also depend on labor-intensive assembly – electronics, jewelry, and orthopedic and prosthetic devices. Less than a decade ago, *maquiladoras* played an insignificant role in the regional economy (Table 4.1 above). Currently, however, these firms comprise more than one-third of total manufacturing employment in Yucatán and more than 80 percent of total exports (*Secretaría de Desarrollo Industrial*, 2000).

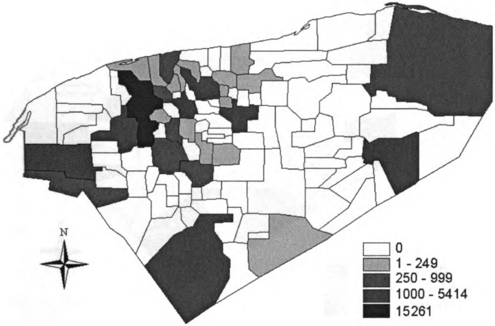

Figure 4.7 *Maquiladora* employment by *municipio*, 2001

4.5.1 Geographic distribution of maquiladoras

As displayed in Figure 4.6 above, more than 60 percent of export-oriented firms in Yucatán are located in Mérida. In general, these firms are smaller and "older" than those in rural areas. About 60 percent of total employment in *maquiladoras*, however, is found in rural areas of the state. As shown above, export-oriented firms in rural areas are clustered in Yucatán's traditional "henequen zone," the most heavily populated area of the state within a radius of 80 kilometers around Mérida. In general, rural *maquilas* are "more recent" and larger than those in Mérida. As the map indicates, *maquiladoras* are found in relatively few *municipios* in Yucatán (only 30 of 106 *municipios*). Most locations have only one *maquiladora*, though export-oriented firms account for substantial employment in these communities due to their size (about 395 employees on average).

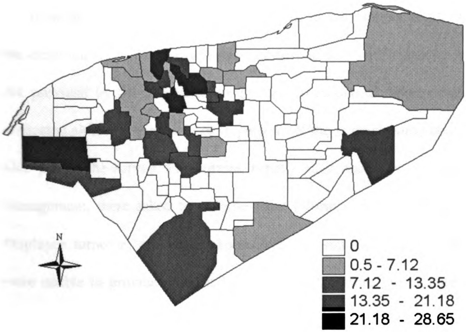

Figure 4.8 *Maquiladora* employment as a percentage of total formal employment

Figure 4.7 above indicates current *maquiladora* employment by *municipio*. Mérida, obviously, accounts for the greatest share of export-oriented employment (15,261). Notwithstanding the small number of firms found in individual *municipios*, several other locations also have significant *maquiladora* workforces, including Motul (5413), Valladolid (3781), Maxcanu (1904), and Uman (1508). Figure 4.8 above reinforces the prominent role that *maquiladoras* play in local economies. Although the largest *maquiladora* workforce, by far, is found in Mérida, export-oriented industries account for less than seven percent of the city's total employment. In several locations, however, *maquiladora* employment accounts for a significantly greater share of formal employment.

4.6 Direct economic impacts of the *maquila* strategy

A survey of *maquiladoras* was conducted in the summer of 1999 in order to assess the direct impacts of export-oriented industrialization on Yucatán's economy. Based on a list provided by the *Secretaría de Desarrollo Industrial*, approximately 60 firms were contacted either by telephone or in person. Of the *maquiladoras* contacted, 45 agreed to take part in the survey. Participants, usually plant managers or other representatives of management, were asked to provide basic information on start-up costs, employment, employee turnover, and other expenditures. In some instances respondents refused or were unable to provide requested information; therefore, the sample size used to make inferences regarding economic impacts sometimes is less than the total number of firms taking part in the survey. Nonetheless, the collection of firm-level data allows inferences to be drawn about the *maquiladora* sector as a whole. A copy of the survey is included in Appendix A.1.

In addition, aggregate secondary data on *maquiladoras* were obtained from the local office of the *Instituto Nacional de Estadística, Geografía e Informática* (INEGI). These unpublished data were employed to confirm the accuracy and supplement survey data as needed. INEGI data were drawn from monthly reports submitted by clothing *maquiladoras*. It should be noted, however, that the data provided by INEGI are incomplete, consisting of aggregate information from only 42 firms. Of the 45 plants surveyed for this study, only 23 were reporting to INEGI at the time. The list provided by the *Secretaría de Desarrollo Industrial* listed 145 *maquiladoras* as of March 2001.

The direct impacts of *maquiladoras* on Yucatan's economy are comprised of at least five distinct components: the initial expenses (start-up costs) incurred within the state; the number of direct jobs created; the salaries associated with these jobs; the purchase of locally-produced commodity inputs; and the purchase of a variety of services associated with operating a plant in Yucatán. In order to calculate the total direct impacts of all *maquiladoras* on the state's economy, survey data were collected and used to estimate several relatively simple models that facilitate prediction of missing data from firms that did not participate in the survey.

4.6.1 Start-up costs

Analysis of survey data from 35 firms indicates that, on average, *maquiladoras* invested about \$350 thousand (US) in start-up costs. Since much of the machinery used in export-oriented production is imported duty-free under the *maquiladora* program, only 40 percent of these initial expenditures, about $140 thousand (US) per plant, were incurred in Yucatán.

4.6.2 Employment

According to survey data and information provided by INEGI and Yucatan's *Secretaría de Desarrollo Industrial*, export-oriented firms directly employed approximately 37,327 men and women as of March 2001. A common criticism of *maquiladoras* is their tendency to exploit a female workforce almost exclusively. In the state of Yucatán, however, between 25 and 30 percent of production workers in *maquiladoras* are men. In addition, the annual employee turnover rates of firms participating in the survey were substantially lower than those of *maquiladoras* in other parts of Mexico. On average, annual turnover was less than 35 percent.

4.6.3 Salaries and benefits

Several firms were reluctant or unable to provide information on total salaries and benefits. Therefore, available data and ordinary least squares (OLS) were employed to estimate this information. Using survey data from 34 firms (that provided both employment and salary information), a simple OLS model was estimated, regressing total salaries and benefits on the number of employees. Intuitively, this relationship makes sense – the number of persons employed by each firm should be the single most important determinant of salaries and benefits. The results of the model are displayed below:[2]

[2] The first line of OLS model below (and all subsequent regression models) contains estimated coefficients. The second line provides corresponding standard errors.

$$\textbf{Salaries} = -55.613 + 2.351\,\textbf{Employment}$$
$$\qquad\qquad 34.242 \quad 0.113$$
$$\textbf{Adj. } R^2 = 0.929 \qquad F_{(1,32)} = 432.030 \qquad p = 0.0000$$

As the model indicates, the number of employees accounts for almost 93 percent of the variation in total salaries and benefits at the firm level. In addition, the coefficient of the independent variable (measured in thousands of U.S. dollars) is highly statistically significant and takes the expected sign. Since the model explains a substantial amount of the variation in the dependent variable and reliable employment data are readily available for all firms, total salaries and benefits can be calculated with some degree of confidence for the entire *maquiladora* sector. Based on the results of the OLS model above, overall salaries and benefits accruing to the 37,327 employees of *maquiladoras* in Yucatán are estimated at more than $87 million (US).

4.6.4 Other expenditures

The survey also indicates that of every dollar spent in Mexico, the average firm allocates more than 50 cents to salaries and benefits, 33 cents to producer services, and about five cents to locally purchased commodity inputs. These estimates compare favorably with the data collected by INEGI.

Of the 45 *maquiladoras* participating in the survey, 36 provided information on their gross annual operating expenses. Excluding salaries and benefits and commodity purchases, the remaining operating expenses of these plants – producer services – totaled more than $11 million (US), an average of roughly $310 thousand (US) per firm. The data collected by INEGI are comparable, indicating about $18 million total among 42 plants, or somewhat more than $400 thousand (US) in operating expenses on average. In light of substantial missing data, a simple OLS model also may be used to estimate the total value of producer services consumed by all 145 *maquiladoras*. Again, total firm employment may be used as the explanatory variable since it is readily available for all *maquiladoras* and is associated with the "scale" of plant operations. The dependent variable corresponds to total expenditures on producer services (PrdSrv). The results of the model are found below:

$$\mathbf{PrdSrv} = \underset{30.405}{30.908} + \underset{0.107}{1.229}\mathbf{Employment}$$

$$\mathbf{Adj.\ R^2} = 0.788 \qquad \mathbf{F}_{(1,34)} = 130.793 \qquad \mathbf{p} = 0.0000$$

Results reveal that employment accounts for a substantial amount of the variation in expenditures on producer services (almost 79 percent). Again, the overall model and independent variable are highly statistically significant. Consequently, the model above can be used to forecast the expenses of firms that failed to provide information on producer services. Based on regression coefficients, the total value of production-related services consumed by the 145 *maquiladoras* is approximately $50 million (US).

The 45 firms taking part in the survey also reported purchasing almost $2 million (US) of commodity inputs in the state of Yucatan. These purchases are essentially retail and wholesale transactions since the goods purchased – thread, fabric, elastic, etc. – are not produced within the state. According to INEGI data, more than $8 million (US) of commodity inputs were purchased domestically by *maquiladoras* in Yucatán in 2000. INEGI data, however, do not differentiate between purchases made in Yucatán and those made in other parts of Mexico. Initial data analysis indicated that the value of commodity inputs purchased in Yucatan was not strongly associated with any of the other survey variables (percent of final product exported, percent of raw materials imported, employment, etc.). Therefore, no attempt has been made in this dissertation to estimate the total value of commodity purchases made in the state.

Nonetheless, it can be concluded with a substantial degree of confidence that Yucatán's *maquiladoras* are injecting at least $140 million (US) directly into the state's economy each year in terms of salaries and benefits ($87 million), purchase of producer services ($50 million), and commodity inputs ($2 to $3 million). This figure does not include the impact of initial investment in new plants, which represents an additional $2 to $3 million annually (based on an average of about 20 new plants per year since 1995).

The results presented above represent merely the direct impacts of *maquiladoras* on Yucatán's economy. A more complete indication of the economic importance of export-oriented firms can be obtained only if the impact of secondary purchases of goods and services by firms and households is considered. Estimation of these indirect and induced effects (as well as distributional consequences) comprises the primary focus of this study and is taken up formally in Chapter Six. Before addressing the inter-regional distribution of overall economic impacts, however, it is necessary to develop a methodology that facilitates such an analysis. Development of this methodology is the subject of the following chapter.

Chapter Five

AN INTEGRATED MODEL OF YUCATAN'S SPACE-ECONOMY

5.1 Regional modeling and regional science

Regional analysis deals with the study of sub-national territories in which issues of location, distance, contiguity and interaction within and between regions are the primary focus. Based on this definition, Anselin and Madden (1991) offer a methodology that will guide analysis in the context of this dissertation. From their perspective, the point of departure for regional modeling is identification of the appropriate regions and collection of necessary data. Once regions have been defined, data must be organized in a consistent system to facilitate analysis. Typically, an accounting system – of which the input-output table is an example – is the preferred framework. After these accounts have been developed, it is possible to generate models, carry out data analysis, and test hypotheses.

5.1.1 Integrated modeling in regional science

In the regional science literature, a model is termed "integrated" if it considers more than a single process in a regional context, focuses on multiple regions or spatial scales, or combines more than one modeling technique (Rey, 2000). Typically, the results from one component of the integrated model serve as inputs in subsequent stages of analysis. According to this definition, then, the model proposed below may be defined as integrated since it focuses on multiple spatial scales (regional and local) and combines more than one modeling technique (input-output analysis and spatial econometrics). Specifically, the employment multipliers derived from inter-regional input-output analysis will be utilized to calibrate spatial econometric models and estimate economic impacts at the *municipio* level in Yucatán.

5.2 Research design

The analysis portion of this dissertation consists of three inter-related activities: acquisition of needed primary and secondary data; construction of an 18-sector inter-regional input-output (IRIO) model; and development of spatial multipliers at the local scale in Yucatán based on spatial econometric techniques. As mentioned above, the primary objective of this study is to understand more fully the impact of export-oriented industrialization (EOI) on economic structure, employment and incomes in Yucatán. The integrated model of Yucatán's space-economy will be employed to achieve this objective and test the hypotheses specified in Chapter One.

5.2.1 Acquisition of primary and secondary data

In order to develop an integrated model of Yucatán's space-economy, a combination of primary and secondary data will be used. Available secondary data include information from the 1989, 1994 and 1999 Economic Censuses, the 1990 and 2000 Censuses of

Population and Housing, and the *Banco de Información Económica*.[1] All data are published by Mexico's *Instituto Nacional de Estadística, Geografía e Informática* (INEGI).

The 1989, 1994 and 1999 Economic Censuses offer data on employment, total wages and benefits, total output, total inputs, and value added by sector. The 1990 and 2000 Population Censuses provide information on employment by sector and economically active population. In both instances, data are available at the *municipio* level. Among other data series, the *Banco de Información Económica* (BIE) provides annual information on the *maquiladora* industry at the state level. Data include number of establishments, total employment, wages, profits, intermediate consumption, value of production, and overall value added.

Additional secondary data resources include the regional input-output table for the state of Yucatán and social accounts data for two rural *municipios*. The regional input-output table was developed by researchers at the *Centro de Investigaciones y Estudios Avanzados del Instituto Politécnico Nacional* (CINVESTAV, 2000). The table consists of 72 sectors and was compiled from a variety of primary and secondary sources (for 1993). Technical coefficients and sectoral multipliers from this regional IO table are included in Appendix B. As discussed below, the regional table will provide many of the baseline technical coefficients and other needed components of the inter-regional model. Social accounts data also have been compiled for two rural *municipios* (Hocabá and Chabihau)

[1] Data from Mexican economic censuses refer to economic activity during the previous year. Therefore, the 1989 census provides information for 1988, the 1994 census offers data on 1993, etc. As a result, input-output models developed in this study correspond to 1988, 1993 and 1998.

by two recent graduates of the *Universidad Autónoma de Yucatán* (Ortiz, 1999; SEDESOL, 2000). This information will be integrated with primary data to estimate the sectoral and regional distribution of income and expenditures of rural households.

Information from these secondary sources will be supplemented with primary data collected from four sources – *maquiladoras*, domestic firms, officials of trade organizations that represent firms in different sectors of Yucatán's economy, and individual households.

As mentioned in the previous chapter, representatives of individual *maquiladoras* were surveyed during the summer of 1999 in order to determine total value of production, total employment, salaries and benefits, cost and origin of raw materials, intermediate inputs and producer services, and final destination of production. Approximately 60 *maquiladoras* were contacted and asked to participate in the survey; three-quarters of these firms (45 firms) agreed to take part. A copy of the survey is included in Appendix A.1.

In addition, a small sample of 44 domestic firms was surveyed in February and March 2001 to identify the origin of their intermediate inputs and raw materials and the final destination of their finished products. The purpose of the survey was to determine what types of raw materials and intermediate goods different firms consume and the destination – both geographically and sectorally – of their output. A copy of this survey is also included in Appendix A.2.

Due to its limited size, the survey of domestic firms has been supplemented with expert opinion from officials of state and national trade organizations that represent firms in three different sectors of Yucatán's economy. In general, representatives of these groups were asked to respond hypothetically to the survey of domestic industries as if they operated a "typical" or "average" firm in urban or rural regions of Yucatán. Incorporation of expert opinion in the development and calibration of input-output coefficients has been suggested as an alternative to a "full-blown" survey by Miernyk (1965) among others. Trade organizations that took part include the Chambers of the Clothing and Apparel, Manufacturing, and Baking industries.

Furthermore, a small sample of 25 private households in Mérida and rural areas was interviewed to gain a first-hand indication of the distribution of their monthly expenses. The purpose of the survey was to determine what kinds of goods and services households consume and the percentage of household income spent in different sectors of Yucatán's economy (housing, food, clothing, entertainment, etc.). The information obtained from this survey will be integrated with data from the regional input-output table and rural social accounts to calculate the sectoral and regional distribution of household expenditures in rural and urban areas of Yucatán. Again, a copy of this survey is included in Appendix A.3.

5.2.2 Construction of inter-regional input-output (IRIO) model

The primary data collected in the surveys above will be combined with existing secondary data in order to develop a hybrid or mongrel (survey/non-survey) inter-regional input-output model (IRIO) of Yucatán's economy.

Input-output (IO) analysis is a modeling technique that divides the economy into two components – consumption and production – and accounts for the direct and indirect interdependencies or linkages among the different sectors of the economy (firms, households, etc.). The technique was introduced by Leontief in the 1930s and adapted for the purposes of regional analysis by Isard in the 1950s (Isard et al., 1998). IO analysis remains an extremely useful tool for planning and regional analysis due to its flexibility. Furthermore, it is an empirical model that is not associated with any particular economic or geographic "paradigm" (Hewings, 1985).

Traditionally, the IO model has been employed to assess the economy-wide implications of changes in "exogenous" factors such as household demand, government spending or international trade (Sadoulet and de Janvry, 1995). Since changes in export-oriented production, by their very nature, respond to forces external to Yucatán's economy, the technique is well-suited for policy analysis in this proposed application. In the vast majority of cases, IO analysis is used in an *ex ante* fashion to estimate the potential outcomes of a given policy decision. In this instance, however, the technique will be applied in an *ex post* manner to assess the regional implications that have been brought about by Yucatán's adoption of the export-oriented industrialization strategy.

The primary objective of the inter-regional input-output model for Yucatán is holistic accuracy, as defined by Jensen (1980). Rather than pursuing the impossible accuracy of each cell of the IO table (partitive accuracy), holistic accuracy emphasizes representation of the main features of the regional economy in a descriptive sense while preserving the importance of these features in an analytical sense. In other words, the goal of the IRIO table is to accurately reflect the relative size and overall structure of Yucatán's urban and rural economies.

In a seminal paper, Alonso (1968) distinguishes between errors of specification and errors of measurement. As implied in the preceding paragraph, some degree of measurement error is inevitable in a model that relies heavily upon secondary data and statistical and mechanical methods for adjusting such information. However, even in the event of considerable measurement error, holistic accuracy is possible. With respect to errors of specification, the proposed integrated model is a substantial improvement over previous studies in several respects. This study, for example, incorporates explicitly the role of "producer" services and the importance of household consumption.

The emphasis on holistic accuracy will become readily apparent in the discussion of the development of the IRIO model that follows. In several instances, relatively simplistic assumptions have been made to facilitate analysis of distributional consequences. In all cases, justification of these assumptions is argued on practical grounds – in many instances data are simply unavailable and could not be obtained with limited resources. Hannon and Ruth (1997) assert that models built on uncertain parameters (assumptions) may be of value in providing a "picture of a particular process, rather than exact information." Furthermore, they affirm that models cannot be verified completely by comparing results with the real world. Instead, verification must be made in terms of model consistency – logical accuracy of its internal structure (Hannon and Ruth, 1997). Consequently, the acceptability and viability of model assumptions should be judged on their reasonableness and the pursuit of holistic accuracy mentioned above.

Notwithstanding its utility, the input-output model has its limitations. In general, IO analysis makes three assumptions that violate basic economic theory – proportionality, constant returns to scale, and no substitution. First and foremost, the model assumes that each sector of the economy consumes inputs in fixed proportions. In other words, the amount of a particular intermediate input needed by a given industry is a "fixed proportion" (linear function) of its output. A second shortcoming is the model's assumption of constant returns to scale, which ignores the possibility of economies of scale in different industries. Finally, the model assumes no substitution between different inputs. No matter how much of an intermediate input becomes available, the quantity a sector can produce is limited by the availability of other inputs.

Other serious criticisms also have been voiced, including assumptions of perfectly elastic supply and fixed prices (failure to incorporate prices explicitly). As Partridge and Rickman (1998) note, as a result of these assumptions, all predicted change in the IO model derives from exogenous change in final demand. Furthermore, predicted change in the regional economy is always proportionate to the exogenous change.

Recently, researchers have favored computable general equilibrium (CGE) models as a means of assessing policy impacts more completely. Although these models offer many advantages over the traditional IO model – ability to incorporate increasing returns to scale and explicit economic theory (impact of prices) – they require massive amounts of data and depend greatly on the calibration of parameters that are frequently unknown or unavailable.[2] Furthermore, the results obtained from CGE models may not differ significantly from those obtained from traditional input-output analysis (Partridge and Rickman, 1998). Notwithstanding the potential gains of CGE analysis and the criticisms mentioned above, many researchers believe that the insights provided by input-analysis into the workings of the regional economy outweigh its potential shortcomings.

Figure 5.1 below provides a highly stylized representation of a basic regional input-output table. In general, rows of the table correspond to sales from a given sector to all

[2] Haddad's (1999) three-region CGE model for Brazil, for example, includes more than 240,000 equations.

sectors of the economy; columns represent purchases of intermediate inputs, raw materials, labor, etc. made by each sector of the economy. Data needed for construction of a basic regional IO table include sectoral estimates of output, inputs, value added, imports, exports and other components of final demand.

Sector	1 . . . n	Final Demand (Y)			Total Output (X_i)
1 . . . n	*Inter-Industry Transactions (x_{ij})*	*HH (Y_1)*	*Other (Y_2)*	*Exports (Y_3)*	*Total Production In Each Sector*
Imports (I_j)					
Value Added (VA)	*Salaries (VA_1)* *Other VA (VA_2)*				
Total Inputs (X_j)					*Total Production in Economy (X)*

Figure 5.1 Stylized regional input-output table

The regional IO table is essentially a double-entry accounting system. The table is employed for the purposes of input-output analysis by making the assumptions listed above, simulating exogenous changes to final demand, and estimating the resulting impacts on output, income and employment.

Although the data requirements are considerably more demanding, the basic regional input-output framework can be extended readily to an inter-regional context in order to account for linkages between different locations, as well as different sectors of the economy. In this proposed dissertation, an inter-regional input-output (IRIO) model will be developed in order to assess the impact of the EOI strategy in urban and rural areas of Yucatán. Therefore, primary and secondary data must be ordered not only by sector, but also by region of the state. In the case of each region, the IRIO table partitions transactions into intra-regional and inter-regional economic activity. A highly stylized representation of the components of an IRIO table is shown in Figure 5.2 below.

As in the regional table, the rows of the IRIO table correspond to sales and the columns represent purchases of inputs. However, the shaded portions of the table indicate inter-regional transactions – sales and purchases that take place between different regions of the economy. The diagonal quadrants account for intra-regional economic activity. In addition to the basic data required for the regional input-output model, some estimate of the inter-regional distribution of inter-industry transactions and final demand must be obtained to determine the inter-regional portion of the IRIO table.

Region		MERIDA	RURAL		
	Sector	1 . . . n HH	1 . . . N HH	Other FD	Total Output
M	1				
E	.				
R	.				
I	.				
D	N				
A	Employment				
	Wages				
	Other VA				
	1				
R	.				
U	.				
R	.				
A	N				
L	Employment				
	Wages				
	Other VA				
	Imports				
	Total Outlays				

Figure 5.2 Stylized inter-regional input-output table

5.2.2.1 Derivation of IRIO model components

The baseline inter-regional IO model will be derived by expanding the existing regional IO table for Yucatán based on available primary and secondary data. Derivation of each of the necessary components of the IRIO model is discussed in detail below.

Data on **total output/inputs, value added, employment** and **wages and benefits** are available at the *municipio* level from the 1989, 1993 and 1999 Economic Censuses for the first 17 sectors shown in Table 5.1 below. Similar data are available for *maquiladora* industries (Sector 18) at the state level through the *Banco de Información Económica*. With respect to *maquiladora* industries, total output/inputs, value added, employment and wages and benefits will be allocated to each region (urban/rural) based on secondary information provided by Yucatán's *Secretaría de Desarrollo Económico* and INEGI. Based on this information, 74 percent of output, 84 percent of employment, and 100 percent of other value added were concentrated in Mérida in 1993.

Sector	Industry
1	Agriculture
2	Mining
3	Food products
4	Textile products
5	Wood products
6	Paper products
7	Chemical products
8	Non-metallic products
9	Basic metal products
10	Machinery and equipment
11	Other manufacturing
12	Construction
13	Public utilities
14	Commerce, hotels and restaurants
15	Transportation and communications
16	Financial services and real estate
17	Personal and professional services
18	*Maquiladora* industries

Table 5.1 Industrial sectors included in integrated model

Data on **imports**, **exports** and **other non-household components of final demand** will be derived for all non-*maquiladora* industries by aggregating data from the 72-sector regional IO table compiled by CINVESTAV. Again, in the case of *maquiladoras*, import and export data may be obtained from the *Banco de Información Económica*. For the purposes of this dissertation, it will be assumed that imports and exports of export-oriented firms at the regional level are proportional to total output.

Household demand for residents of Mérida will be derived primarily from the regional input-output table. As shown below in Table 5.2, the sectoral distribution of household expenditures drawn from the small sample of households in Mérida differs somewhat from the regional IO table. However, since the data from regional table are based on a significantly larger sample, it was decided that this information is likely more reliable.

SECTOR	Survey	IO Table
Food	20.5%	10.1%
Housing	10.9%	17.6%
Shopping/Restaurants	21.7%	15.5%
Transportation	14.1%	15.1%
Other Services	24.6%	31.1%

Table 5.2 Distribution of household expenditures

Household demand for rural areas will be drawn from two sources. On the one hand, it will be assumed the 50 percent of rural households (particularly residents of more "urban" *municipios* in close proximity to Mérida) have the same household consumption patterns as residents of Mérida. In the case of remaining rural areas (representing the poorest and most marginalized households), expenditure data from social accounts for the *municipios* of Hocabá and Chabihau will be employed. The integration of these two data sources yields the distribution of income for rural households displayed in Table 5.3 below. Not surprisingly, the average rural household spends a considerably greater share of its income (41 percent versus 27.8 percent) on food and shelter than residents of Mérida.

As mentioned in Chapter Two, economic growth is initially concentrated in urban locations. Rapid growth of urban areas purportedly induces growth in the surrounding rural hinterlands. Among other "spillover" effects, providing employment opportunities for rural residents in one way in which the urban core promotes economic growth in the countryside. As such, it is quite reasonable to expect that residents of rural areas around Mérida make up a share of urban employment. In addition, in some cases economic activity in rural areas may provide job opportunities for city residents.

SECTOR	Expenditure
Food	26.6%
Housing	14.4%
Shopping/Restaurants	12.7%
Transportation	12.4%
Other Services	25.4%

Table 5.3 Estimated distribution of expenditures for rural households

Employment information from the 1990 Population Census and the 1989 Economic Census may be utilized to estimate this **inter-regional employment**. In this study, inter-regional employment is defined as employment of a resident of a given region (rural Yucatán, for example) in another region (Mérida). The 1990 Population Census identifies region of residence and sector of employment of the resident – it does not identify the location of the workplace. On the other hand, the 1989 Economic Census identifies total employment in a given sector in a particular region – it does not identify the residence of worker. Therefore, if employment rates from both censuses are compared, it is possible to estimate the number of persons who live in one region, but work in another region. An example is shown in Table 5.4 using actual data for Yucatán.

Region	1989 Economic Census	1990 Population Census
Mérida	72.5%	67.3%
Rural	27.5%	33.7%

Table 5.4 Estimation of inter-regional employment in personal and professional services

As displayed above, the 1989 Economic Census indicates that 72.5 percent of all employment in personal and professional services is concentrated in Mérida. However, the 1990 Population Census reveals that only 67.3 percent of all employment in personal and professional services is comprised of residents of Mérida. The remainder, therefore, must be comprised of inter-regional employment – persons who reside in rural areas and work in the state capital. Therefore, of the 21,209 persons employed in personal and professional services in Mérida in 1989, it is estimated that 1845 workers reside in rural *municipios* and work in the state capital. Although somewhat crude, this technique yields surprisingly acceptable results. For 1993, a total "net surplus" of 14,749 jobs exists in 14 of 17 sectors or Mérida's economy. This total represents slightly more than 12 percent of total employment in the urban region. A total surplus of 611 jobs (filled by residents of Mérida) is identified in two rural sectors. For 1998, the results are similar – inter-regional employment comprises more than 13 percent of total jobs in Mérida and less than one percent of positions in rural areas.

In the case of *maquiladora* industries in Mérida, survey data suggest that approximately 18 percent of employees come from rural areas of the state. With respect to export-oriented firms in rural *municipios*, it was assumed that all management and technical staff (about five percent of total employment) was comprised of Mérida residents. This assumption coincides with impressions gleaned from fieldwork – generally speaking, plant managers and other skilled employees reside in the state capital and travel to work in rural *municipios* on a daily or weekly basis.

As mentioned above, a survey of 44 domestic firms and representatives of three local trade organizations was carried out in February and March 2001. Unfortunately, such a small survey precludes any ability to derive reliable technical coefficients for the 18 industrial sectors that make up Yucatán's economy. However, the survey does permit some general insights into consumption and distribution patterns of firms in urban and rural areas of the state.

On average, domestic firms in Yucatán purchase almost 60 percent of their inputs within the state. The remainder is comprised of imports. About 93 percent of inputs purchased within Yucatán come from Mérida. Slightly less than seven percent of purchases are made in rural areas. With respect to output, 77 percent of total production is sold within Yucatán.[3] Almost one-half of all sales within the state are made to rural *municipios*. Finally, direct sales to consumers (households) make up more than 23 percent of total sales.

Firms in urban and rural areas display marked differences in their sales and purchases. The average rural firm acquires 74.5 percent of its inputs in Yucatán. More than 75 percent of these purchases are made in the state capital. The typical business in Mérida is slightly less likely to import – 65.1 percent of its inputs are sourced within the state. With respect to sales, rural firms sell a greater share of their output directly to the public (30.8 percent vs. 17 percent). Firms in Mérida report selling about 89 percent of their output in Yucatán; almost 50 percent of their in-state sales are made to rural *municipios*. Firms in rural areas, on the other hand, sell only about 3.5 percent of their total in-state sales to businesses and households in Mérida.

Due to the relatively small sample size of the survey of domestic firms, a "mechanical" technique was sought to estimate **inter-regional inter-industry transactions**. Consequently, in a fashion analogous to the Kendrick and Jaycox (1965)

[3] This information provides an indication of Yucatán's position as a net importer – the state imports 40 percent of its inputs but exports only 23 percent of its output.

method of deriving gross state product, inter-regional flows were apportioned by region based on total production. For example, in the case of agriculture, rural areas account for about 95 percent of total production in Yucatán. Therefore, it was assumed that firms and residents of Mérida purchase 95 percent of needed agricultural goods from producers in rural areas. Remaining purchases would be made of firms in Mérida.

This assumption is certainly simplistic. However, it allows regional and inter-regional purchase coefficients to vary over time based on changes in output and economic structure. For example, rural *municipios* accounted for only 12.4 percent of total production in textile industries in 1988. By 1998, however, rural production made up about one-third of total output. As a consequence, it seems reasonable to expect rural areas to be somewhat more self-sufficient in meeting intra-regional demands for clothing and textiles. The apportionment technique adopted above facilitates analysis of such changes.[4]

Technical coefficients for *maquila* industries will be based on survey data. This information will be utilized to "augment" the inter-regional IO table for the state of Yucatán – in essence, an additional sector corresponding to export-oriented industries will be added to each region. Since *maquiladoras* in Yucatán are concentrated in two industries – clothing and apparel and other manufacturing – and firms purchase very few commodity inputs locally and sell no production in Yucatán, little is sacrificed by grouping all export-oriented firms together as an industry.[5]

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[4] Although this *ad hoc* approach is similar in design to allocation based on regional shares of employment (location quotient approach), it represents an improvement in that it allows for "crosshauling."
[5] Survey results indicate that *maquiladoras* purchase about five cents of commodity inputs locally for every dollar of output. Since these goods are not produced in Yucatán, however, only the trade margin – in this instance assumed to be 25 percent of the total spent (1.25 cents) – accrues to commercial firms in Yucatán.

As mentioned above, previous studies contend that *maquiladoras* purchase less than two percent of their inputs within Mexico. However, these studies account for commodity inputs exclusively and fail to consider demand for producer services. In the case of Yucatán, none of the commodity inputs consumed by these firms are produced within the state. However, as shown in Table 5.5 below, the survey of *maquiladoras* reveals that these firms spend more than eight cents for every dollar of production on producer services within the state of Yucatán. With respect to the inter-regional distribution of *maquiladora* purchases, surveys indicate that essentially all of these purchases are made in Mérida (for export-oriented firms in both rural and urban areas).

SECTOR	Expenditure
Public utilities	0.0094
Commerce, hotels and restaurants	0.0125
Transportation and communications	0.0239
Financial services and real estate	0.0114
Personal and professional services	0.0316

Table 5.5 Inter-industry transactions of *maquiladora* industries

In this IRIO model, these inter-industry transactions actually correspond to regional and inter-regional purchase coefficients. Regional purchase coefficients reflect the proportion of a given sector's input needs that can be met by production within the region. Inter-regional purchase coefficients represent the portion of inter-industry demands provided by firms in the other region. The purchase coefficients quantify a given region's ability to meet its input demand, as well as dependence on in-state and out-of-state imports. Since urban and rural areas possess considerably different industrial structures, their ability to meet their own demands for goods and services will vary. The differences in industrial structure at the regional scale will be reflected in the magnitude and sectoral break-down of these purchase coefficients.

5.2.2.2 Construction of IRIO tables for 1988, 1993 and 1998

Several mechanical techniques have been developed to facilitate adjustment or updating of input-output technical coefficients. Among these techniques are the well-known RAS bi-proportional matrix adjustment technique and a related methodology proposed by Hinojosa and Pigozzi (1986, 1988).

In general, the RAS method uses more recent information on intermediate inputs, intermediate output, and total output to adjust the technical coefficients of an existing input-output table (Miller and Blair, 1985; Isard et al., 1998). Typically, the technique has been employed to update IO tables on the basis of new data or to develop regional input-output models based on "borrowed" technical coefficients. The Hinojosa and Pigozzi (1986, 1988) RDS methodology uses a similar adjustment process, but is based on partitioning employment data in a fashion analogous to the traditional economic base model (Hewings, 1985).

Although these methods are useful in adjusting input-output tables, they require information on intermediate outputs (RAS) or make assumptions (RDS) that cannot be justified in the case of Yucatán. Several authors, including Conway (1979, 1990) and Israilevich et al. (1997) have proposed econometric methods to facilitate updating of technical coefficients. Basically, a two-step procedure employing time-series and cross sectional (industrial sectors) data is utilized. The first step uses existing technical coefficients to generate an estimate of output for each sector. Except for the base year, projected output by sector will differ to varying degrees from actual output. The second step employs generalized least squares and regresses actual output for each sector on expected output to capture changes in technical coefficients over time (Conway, 1990). This technique has been widely adopted during the past decade as a means of constructing integrated input-output/economic models (Rey, 2000).

Unfortunately, in this instance the necessary time-series data are lacking. As a consequence, an alternative solution must be sought in order to "backcast" (1988) and forecast (1998) technical coefficients. The framework introduced below is similar in design and spirit to the econometric adjustment process discussed above, however coefficients are updated using a non-linear optimization technique since no time-series data are available.

In order to adjust the technical coefficients of the 1993 regional IO table for Yucatán, data on total output by sector were obtained from the 1989 Economic Census.[6] The inter-industry coefficients of the 1993 regional table were employed to obtain an initial estimate of inter-industry transactions for each sector.[7] It was assumed that total final demand as a percentage of total output remained constant over time. Estimates were next summed across the row (for each "selling" sector) to obtain an overall estimate of total output (sales) by sector. Needless to say, projected output by sector will differ to varying degrees from actual output.

[6] This discussion makes reference to the procedures used to estimate the regional IO coefficients for 1988. Coefficients for 1998 were derived in identical fashion.

[7] Estimated inter-industry transactions were derived by multiplying each of the technical coefficients for a given purchasing (column) industry by its corresponding total output.

Table 5.6 below displays actual output, projected output, and absolute percentage error (APE) by sector for 1988. In general, errors are relatively small, with a weighted average (based on total output by sector) of about 6.7 percent. In general, the largest errors are found in relatively small sectors of Yucatán's economy (mining, chemical products, wood products, etc.). In the case of financial services, output is severely overestimated, indicating fairly prominent technical change (much greater reliance on financial services as an intermediate input) between 1988 and 1993.

Sector	Actual Output	Projected Output	APE
Agriculture	375784	420897	12.0%
Mining	43002	32747	23.8%
Food products	357283	355725	0.4%
Textile products	300887	299262	0.5%
Wood products	41057	35465	13.6%
Paper products	39906	39787	0.3%
Chemical products	66704	53661	19.5%
Non-metallic products	129428	111930	13.5%
Basic metal products	16405	15820	3.6%
Machinery and equipment	31576	31526	0.2%
Other manufacturing	13270	13204	0.5%
Construction	254440	254440	0.0%
Public utilities	49026	52430	6.9%
Commerce, hotels and restaurants	1390462	1355344	2.5%
Transportation and communications	363193	384578	5.9%
Financial services and real estate	308303	453182	47.0%
Personal and professional services	807399	815459	0.9%

Table 5.6 Actual and projected output by sector, 1988

Next, mean absolute deviation (MAD) was calculated for the vectors of actual and projected output. Subsequently, a non-linear optimization (generalized reduced gradient) procedure was employed to adjust technical coefficients iteratively so that the MAD between the two vectors was minimized. In basic terms, the generalized reduced gradient (GRG2) technique is designed to solve continuous functions when the objective function and/or problem constraints are non-linear. In this instance, the objective is a linear function; the constraints, however, are not.

This optimization procedure offers a distinct advantage over adjustment techniques such as RAS and RDS. In general, mechanical techniques adjust rows and columns of technical coefficients uniformly. Each iteration of the RAS method, for example, reduces or increases technical coefficients of each sector by a scaling factor. In addition, any technical coefficient that had an original value of zero will be assigned the same value in subsequent matrix adjustments (Miller and Blair, 1985).[8] The alternative method proposed above does not suffer from these limitations.

The solution to the non-linear optimization problem is subject to a variety of constraints common to all input-output models. In addition, several other constraints may be imposed based on available secondary data. In updating the technical coefficients for all 17 non-*maquiladora* sectors, the non-linear optimization problem consists of 289 variables (technical coefficients from the *17x17* matrix) and 579 constraints. The objective function and basic model constraints are listed below.

Objective Function: $\text{MIN}\ \Sigma\ \frac{|X_i - X_i^*|}{n}$

Constraints: $\Sigma_j X_i^* = \Sigma_j X_i$ for each sector (i)

$a_{ij} \geq 0$

$a_{ij} \leq 1$

$\Sigma_i a_{ij} \leq 1$

Where: X_j refers to actual output for a given sector (i)

X_j^* represents predicted output for a given sector (i)

a_{ij} indicates individual technical coefficients

n corresponds to the (289) elements of a 17x17 matrix

The objective function states that the goal of the optimization process is to minimize the mean absolute deviation (MAD) between actual and predicted output for all 17 sectors. The first set of constraints, however, requires that the predicted output equal the

[8] By the same token, any a_{ij} with an original non-zero value will necessarily be assigned a non-zero value.

actual output for each sector. This requirement means that the MAD will be minimized at a value of zero. The second and third constraints set bounds on possible values of the technical coefficients. The final constraint assures that the sum of the technical coefficients for any given purchasing sector (column) does not exceed feasible values. These final constraints are commonly applied in input-output analysis.

The non-linear optimization procedure converges after approximately 40 iterations. In the vast majority of instances, adjustments to technical coefficients are relatively minor. The most prominent changes are found in agriculture. For example, the intra-industry purchase coefficient for agriculture shifts from 0.148 in 1993 to 0.099 in 1988. Once estimates of regional purchase coefficients have been obtained, the techniques presented in section 5.2.1 above may be employed to apportion economic activity between urban and rural regions and estimate updated inter-regional inter-industry purchase coefficients.

5.2.2.3 Objectives of IRIO analysis

Once complete, the IRIO tables for 1988, 1993 and 1998 will be used to calculate output, income and employment multipliers for both urban and rural areas. In the context of this study, only Type II multipliers, which incorporate the induced effects of wages and household consumption, will be estimated (Isard et al., 1998; Hewings, 1985). The output multiplier will serve to quantify the direct, indirect and induced impacts of *maquiladoras* on production of goods and services within each region of the state. The income multiplier will facilitate assessment of the effects of the EOI strategy in terms of salaries and benefits. The employment multiplier will quantify the job creation effects of export-oriented production.

The IRIO model also facilitates analysis of the distributional consequences of export-oriented industrialization. In addition to the general multipliers mentioned above, intra-regional and inter-regional multipliers may be calculated to disaggregate impacts according to region. The intra-regional multipliers will serve to quantify impacts that remain within a particular region; inter-regional multipliers identify leakages or spillovers between regions. For instance, IRIO employment multipliers will reveal the impact of a change in *maquiladora* production on job creation in both rural and urban areas of the state – in other words, the total employment multiplier may be decomposed into an impact on rural employment and an impact on urban employment.

In addition, the IRIO model will be employed to assess the dynamic effects of the EOI strategy on Yucatán's economy. The output multipliers derived from the IRIO models will be used to estimate the overall contribution of *maquiladora* industries to Yucatan's gross state product (GSP) on an annual basis between 1990 and 2000.[9] In addition, the impact of annual changes in *maquiladora* production between 1991 and 2000 on changes in GSP will be identified. Finally, similar changes in gross regional product (GRP) will be quantified for both Mérida and rural *municipios*.

5.2.3 Development of spatial multipliers

According to Anselin and Bera (1998), spatial econometrics is comprised of a variety of techniques that deal with the peculiarities caused by spatial effects – distance, spatial interaction, and location, for example – in statistical models. Specifically, these

[9] The 1988 multipliers will be used to estimate impacts on GSP for 1990; 1993 multipliers will be used for 1991, 1992, 1993, 1994 and 1995; 1998 multipliers will be used for 1996, 1997, 1998, 1999 and 2000.

techniques focus on two particular concerns – spatial dependence (spatial autocorrelation) and spatial structure (spatial heterogeneity).

Following calculation of IRIO models, spatial econometric techniques will be employed to calibrate a spatially disaggregate economic base model. Hinojosa and Pigozzi (1988), among others, have demonstrated the fundamental equivalence of economic base and input-output multipliers. In a sense, the spatial economic base model is the geographic analogue of the traditional input-output model. Whereas the input-output model quantifies linkages between sectors of the regional economy, the spatial economic base model quantifies basic/non-basic sector linkages between regions.

The spatial economic base model will serve to estimate spatial economic base multipliers at the *municipio* level in Yucatán. Given a change in *maquiladora* employment or output for a given location, the spatial multiplier quantifies the (geographic) extent of economic impacts (Sonis et al., 1994). In other words, if employment in export-oriented firms increases by 1000 jobs in a particular *municipio*, the spatial multiplier reveals the corresponding impacts on employment and income in surrounding locations (as well as locally). Since it would be extremely difficult (impossible given availability of data) to develop a 106-region IRIO model at the local scale in Yucatán, the method proposed below offers a relatively parsimonious framework for estimating basic employment and economic outcomes at the local scale. As in the case of the IRIO model discussed above, the ultimate objective of spatial multiplier analysis is holistic accuracy.

5.2.3.1 Traditional economic base model

Spatial multipliers may be developed by using basic spatial econometric techniques to model the economic base relationship stochastically for a set of sub-regions (i) comprising a larger region (**A**). A non-spatial econometric approach to the economic base model was initially proposed by Mathur and Rosen (1972). The traditional economic base model distinguishes between two kinds of economic activities – basic and non-basic. As indicated in the identity below, total regional economic activity is merely the sum of basic and non-basic components.

$$E_T = E_B + E_{NB} \tag{5.1}$$

where: E_T refers to total regional economic activity
E_B indicates basic activity
E_{NB} represents non-basic activity

Basic (or export) activities serve demands beyond the boundaries of the region. As Hewings (1985) states, these activities are derived from a combination of locational factors, comparative advantage, and historical accident. The second type of economic activity is termed non-basic or local. These activities serve demands within regional boundaries. As Equation 5.2 below shows, the economic base model is premised on the fundamental assumption that non-basic economic activity depends on basic activities. Consequently, total regional economic activity may be modeled as a function of basic activity and any change in the export sector would be expected to bring about a change in total regional economic activity.

$$\begin{aligned} \text{if:} \quad & E_{NB} = f(E_B), \text{ then} \\ & E_T = E_B + f(E_B), \text{ and} \\ & \Delta E_{NB} = f(\Delta E_B), \text{ so} \\ & \Delta E_T = \Delta E_B + f(\Delta E_B) \end{aligned} \tag{5.2}$$

The relationship between basic activity and total activity is specified by the economic base multiplier. In essence, the multiplier reveals the overall impacts within the regional economy of a change in the basic sector. Assuming that non-basic activity is a constant proportion of total activity, the economic base multiplier may be derived in the following fashion.

$$
\begin{aligned}
&\mathbf{r} = E_{NB}/E_T, \text{ so } 0 < \mathbf{r} < 1 \\
&E_{NB} = \mathbf{r}(E_T), \text{ and} \\
&E_T = \mathbf{r}(E_T) + E_B \\
&E_T - \mathbf{r}(E_T) = E_B \\
&E_T(1 - \mathbf{r}) = E_B \\
&E_T = E_B / (1 - \mathbf{r}) \\
&E_T = (1 - \mathbf{r})^{-1} E_B
\end{aligned}
\tag{5.3}
$$

5.2.3.2 Calculating basic and non-basic employment

In this study, sub-regions are defined as the 106 *municipios* making up the state of Yucatán, Mexico. Sectorally disaggregate employment data from the 1999 Economic Census will be utilized to estimate basic, non-basic and total economic activity at the local level.[10] In general, the location quotient (LQ) approach will be employed to calculate these values. The basic formula for the LQ method is shown below.

$$LQ_{ir} = \frac{\left(E_r^i / E_r\right)}{\left(E_S^i / E_S\right)} \tag{5.4}$$

where: E refers to employment
subscript r refers to a given *municipio*
superscript i refers to a particular sector or industry
subscript S refers to the state of Yucatán

[10] Employment data at the *municipio* scale are available for 18 sectors (including *maquiladora* data from Yucatán's *Secretaría de Desarrollo Económico*).

In essence, the location quotient is simply the ratio of two ratios. The numerator expresses the percentage of the workforce employed in a given sector for a particular *municipio*. The denominator displays the same relationship at the state level. If the percentage of the workforce employed in a given sector at the *municipio* level exceeds the state average, the location quotient will be greater than 1. If the LQ is greater than 1, it is assumed that the *municipio* is self-sufficient and that "excess" employment serves demand outside the region. If the LQ is less than 1, it is assumed that the *municipio* is not self-sufficient and that no basic employment exists. Though this approach has its limitations, its use remains common in the literature (Isard et al., 1998). The LQ must be carried out and summed over all sectors for each of Yucatán's *municipios* in order to derive estimates of basic and non-basic employment for each location.

5.2.3.3 Criticisms of the traditional economic base model

Although the traditional economic base model remains a useful tool for regional economic impact assessment, it has been criticized on several grounds. Among the most notable criticisms are the model's failure to account for spillovers and feedback effects between regions and its inability to explain why the size of economic base multipliers varies from region to region.

As shown in Equations 5.1, 5.2 and 5.3 above, economic base multipliers are derived from a simple identity in which total regional activity is a function of basic activity within the region. By default, then, the model assumes that all impacts of basic activity remain within the region. From another perspective, the model assumes that basic economic activity in surrounding regions has no impact upon economic activity in a given location.

As Haining (1987) notes, however, in the real world income generated in a particular sector and place will be spent not only locally, but in neighboring areas. Consequently, output of the local (non-basic) sector in any location will depend not only on income and consumption levels in that area, but in neighboring areas.

Furthermore, since economic base models are typically applied to individual regions, no consideration is given to explanation of the variation in the size of multipliers. As Hewings (1985) points out, non-basic activities are comparable with central place functions. Since the number of central place activities is a function of a region's size, the economic base multiplier also can be expected to increase with the region's size (as a proxy for economic importance). These criticisms may be addressed, however, by using the basic spatial econometrics techniques proposed below.

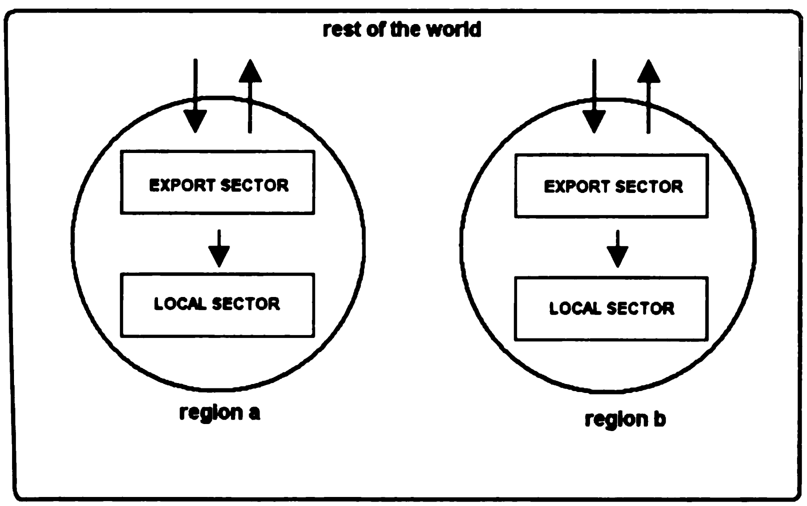

Figure 5.3 Traditional economic base model (two regions)

5.2.3.4 Introducing space into the economic base model

As mentioned in the previous paragraphs, the simple economic base model does not account for the impact of economic activity in one region on neighboring locations. In essence, it is a two-region/two-sector (basic/non-basic) model that treats the local sectors of each regions as autonomous entities (Figure 5.3 above). Consequently, economic activity in one region has no impact on economic activity in other locations. Such an assumption seems untenable in the case of Yucatán and the context of this dissertation.

As discussed at some length in Section 5.2.2.1 above, economic activity in Mérida provides employment for a substantial segment of the rural population. In addition, a significant share of *maquiladora* workers in Mérida resides in rural areas. Therefore, it is quite reasonable to conclude that basic economic activity in Mérida (and other *municipios*) will generate employment for residents of neighboring locations. A portion of the income earned by these "commuters" will be spent in the home community; however, some income likely will be spent in Mérida and the place of employment, as well as other locations. As a result, basic employment in one *municipio* may be expected to generate non-basic employment not only locally, but also in other locations (Figure 5.4 below).

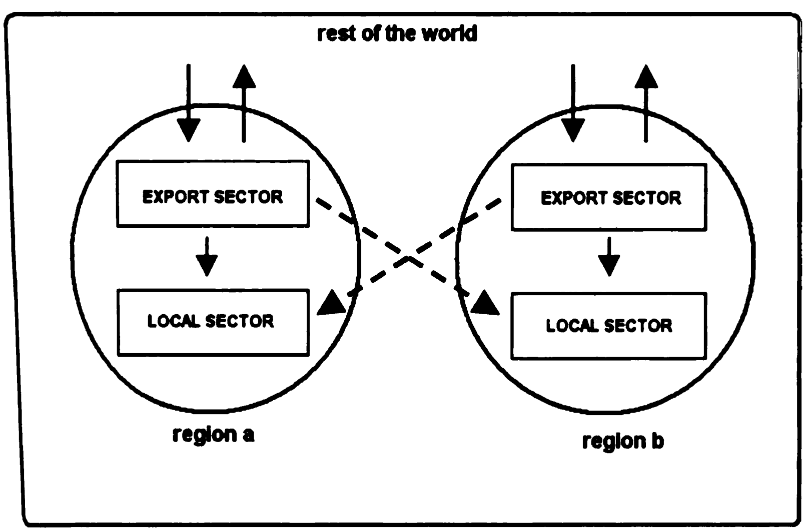

Figure 5.4 Incorporating space into the economic base relationship

Given the openness of local economies, the economic base multiplier may be recast by incorporating interaction among locations that comprise the space-economy. In essence, the traditional economic base multiplier may be "expanded" as shown in Equation 5.5 below.

$$
\begin{aligned}
&\mathbf{E}_{Ti} = \mathbf{E}_{NBi} + \mathbf{E}_{Bi} \qquad (5.5)\\
&\mathbf{E}_{NBi} = (\mathbf{r}\mathbf{E}_{Ti} + \mathbf{w}_{ij}\mathbf{E}_{Bj})\\
&\mathbf{E}_{Ti} = \mathbf{r}\mathbf{E}_{Ti} + \mathbf{E}_{Bi} + \mathbf{w}_{ij}\mathbf{E}_{Bj}\\
&\mathbf{E}_{Ti} - \mathbf{r}\mathbf{E}_{Ti} = \mathbf{E}_{Bi} + \mathbf{w}_{ij}\mathbf{E}_{Bj}\\
&\mathbf{E}_{Ti}(1-\mathbf{r}) = \mathbf{E}_{Bi} + \mathbf{w}_{ij}\mathbf{E}_{Bj}\\
&\mathbf{E}_{Ti} = (1/(1-\mathbf{r}))\mathbf{E}_{Bi} + \mathbf{w}_{ij}\mathbf{E}_{Bj}\\
&\mathbf{E}_{Ti} = (1-\mathbf{r})^{-1}*[\mathbf{E}_{Bi} + \mathbf{w}_{ij}\mathbf{E}_{Bj}]
\end{aligned}
$$

In the expanded economic base multiplier proposed above, total economic activity within a particular region (i) is a function not only of local basic sector activity (E_{Bi}), but also basic sector activity in other locations ($w_{ij}E_{Bj}$). The term w_{ij} expresses the propensity for basic economic activity in others locations (j) to create non-basic economic activity in location i. In the context of spatial econometrics, w_{ij} is called a spatial weights matrix. Derivation of the spatial weights matrix utilized in the integrated model of Yucatán's space-economy is discussed in the following section.

5.2.3.5 Calculating a weights matrix based on Yucatán's space-economy

Spatial econometric analysis relies on the specification of spatial weights matrices in order to quantify the impact of spatial structure on geographic (or economic) processes. Typically, spatial weights matrices are based on relatively simple concepts such as contiguity, nearest neighbors, or inverse distance. Notwithstanding the type of spatial weights utilized, the choice of matrix must be appropriate for the research problem in question. As some scholars have noted (Anselin and Bera, 1998; LeSage, 1999), model results are frequently as much a function of the spatial weights matrix employed as data and other parameters. In this study, a unique spatial weights matrix, based on the concept of economic potential, will be used.

Economic potential is a measure of accessibility and economic influence that identifies the likelihood for spatial interaction between locations (Taaffe et al., 1996). The concept was introduced in the geographic literature by Harris (1954) and Warntz (1964). Several potential measures exist in the geographic literature; in all cases, the models are based on concepts similar to those found in gravity models. In the context of this study, economic potential for a given location *i* is defined as follows:

$$V_i = P_i * \Sigma P_j / d_{ij}^2 \qquad (5.6)$$

where: V_i refers to total potential
P_i is some measure of economic importance at place *i*
P_j represents economic importance at place *j*
d_{ij}^2 is friction of distance or spatial separation between pairs of *municipios*

In general, many different variables may be utilized to calculate economic potential for a particular location. In this study, population at the *municipio* level will be used to operationalize P_i and P_j; d_{ij} is defined as simple geographic distance between centroids of *municipios*. Measures of economic potential for each of the 106 *municipios* in Yucatán are listed in Appendix C and mapped in Figure 5.5 below. Not surprisingly, Mérida (with 40 percent of total population) displays the highest level of economic potential by far.[11] *Municipios* in close proximity to Mérida also exhibit fairly substantial values.

[11] Economic potential for each *municipio* was "scaled" based on the *municipio* with the smallest value. As a result, the smallest possible measure of economic potential is 1. The analysis that follows (and map above) are based on the natural log of economic potential. Therefore, the smallest measure is zero.

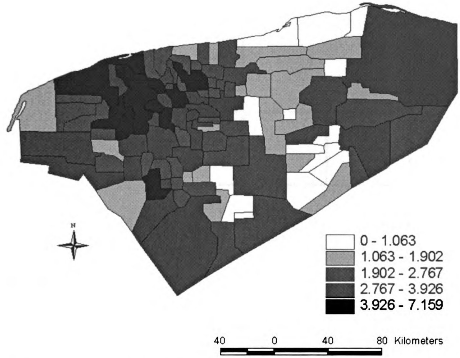

Figure 5.5 Economic potential by *municipio*

As defined above, economic potential is an aggregate measure that serves to quantify the economic importance of any given location. However, as applied in this study, the economic potential for any dyad or pair of *municipios* also may be calculated. In fact, based on Equation 5.6 above, the row sum of these dyads of economic potential for any given location *i* equals that location's total economic potential. This matrix of economic potential is easily calculated. If row standardized to equal 1, it may be used as a weights matrix – a matrix representing the structure of Yucatán's space-economy – in order to apply spatial econometric techniques to the economic base model. An example is presented below to demonstrate how this "spatial-economic" weights matrix was developed.

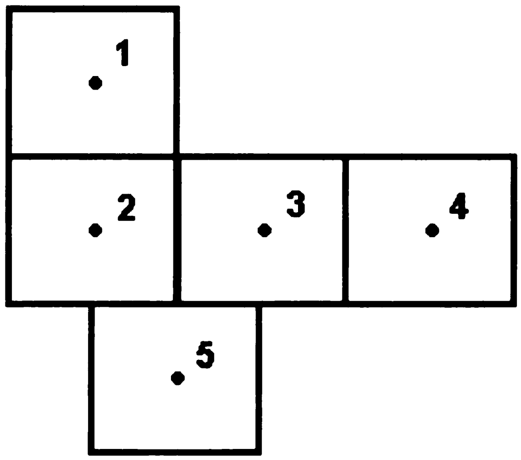

Figure 5.6 Imaginary study area comprised of five regions

Figure 5.6 above represents a simple, imaginary study area comprised of five regions. The equally simple and imaginary data necessary to calculate economic potential for each location – population and distances between region centroids – are shown in Table 5.7 below.

Region	Population	d_{i1}	d_{i2}	d_{i3}	d_{i4}	d_{i5}	V_i
1	12	0	2	3.5	5	4	164.5
2	50	2	0	2	4	3	298.3
3	8	3.5	2	0	2	3	120.1
4	3	5	4	2	0	3.5	18.5
5	7	4	3	3	3.5	0	52.1

Table 5.7 Imaginary data for five regions

The table indicates that region 2, by far, is the most populous location in the imaginary study area. Furthermore, regions 2 and 3 display the smallest aggregate distances to other locations. Not surprisingly, due to its large population and relatively central location, region 2 displays the greatest level of economic potential among the five locations. Region 4, due to its peripheral location and small population, possesses a level of economic potential more than 15 times smaller than that of region 2.

Region	1	2	3	4	5
1	0	150	7.84	1.44	5.25
2	150	0	100	9.38	38.89
3	7.84	100	0	6	6.22
4	1.44	9.38	6	0	1.71
5	5.25	38.89	6.22	1.71	0

Table 5.8 Disaggregation of economic potential

As mentioned above, economic potential (V_i) for any given location is an aggregate measure of economic influence. Disaggregation of total economic potential for a particular region is a simple task, however, and is displayed in Table 5.8 above. This table reveals the relative importance of dyads or interaction between pairs of locations in accounting for a region's total economic potential. This matrix is symmetrical because identical data (particularly d_{ij}) have been used in estimating economic potential between places *i* and *j*, as well as *j* and *i*. If this matrix is row standardized to sum to one, however, the relative weights assigned to each dyad change markedly (Table 5.9 below). For example, although the economic potential between regions 1 and 2 (V_{12} and V_{21} in the table above) is 150, the relative weight assigned it is 80 percent greater in region 1 than region 2. Also of note is the relative importance of region 2 with respect to other locations in the study area. Due primarily to its relative economic importance, this region accounts more than 50 percent of total economic potential in each of the remaining zones.

Region	1	2	3	4	5
1	0	0.91	0.05	0.01	0.03
2	0.50	0	0.34	0.03	0.13
3	0.07	0.83	0	0.05	0.05
4	0.08	0.51	0.32	0	0.09
5	0.10	0.75	0.12	0.03	0

Table 5.9 Spatial-economic weights matrix

The spatial-economic weights matrix shown above may be employed in analogous fashion to more traditional spatial weights matrices. Essentially, this matrix includes not only the impact of proximity and spatial separation (as in customary weights matrices), but also an indication of relative economic importance. Conceptually, therefore, this matrix may be thought of as a combination of two kinds of weights – inverse distance and relative position in a central place hierarchy (as a proxy for economic importance). Although weights derived from economic relationships have received limited attention in the literature (for example, Case et al., 1993), the spatial-economic weights employed in this study represents the first attempt to integrate geographic location and economic importance as weights for spatial econometric analysis.

Region	1	2	3	4	5
1	0	0.50	0.50	0.00	0.00
2	0.33	0	0.33	0.00	0.33
3	0.25	0.25	0	0.25	0.25
4	0.00	0.00	0.00	0	1.00
5	0.00	0.50	0.50	0.00	0

Table 5.10 Traditional spatial weights matrix based on simple contiguity

Spatial-economic weights may be compared to traditional spatial weights based on contiguity to highlight differences between the two approaches (Table 5.10). Region 3 provides a good example of relevant differences in these weights matrices. Based on simple contiguity, each neighbor exerts a similar effect on this location (0.25 each). However, the spatial-economic weights matrix (Table 5.9) suggests that the impact of each neighbor will vary greatly and that this influence will depend on each region's economic importance, as well as distance. Given that the overall economic potential (importance) of region 2 is more than 15 times greater than that of region 4, it is unlikely that both locations will exert an equivalent effect on region 3. In summary, then, development of a truly spatial economic base model requires components of both proximity and economic importance in order to account for potential spillovers between regions. In essence, the magnitude of feedback effects among *municipios* in Yucatán likely depend not only on relative location, but also functional economic relationships.

5.2.3.6 Spatial economic base model

Once estimates of basic and non-basic employment and the spatial-economic weights matrix have been obtained, the next step in modeling the economic base relationship econometrically is calibration of a traditional OLS model. Total employment for 1999 at the *municipio* level serves as the dependent variable in this model. Basic employment at the same scale, as calculated using the employment multipliers from the IRIO and the location quotient technique, serves as the independent variable. Due to extreme non-normality (and to evoke a more linear relationship), the natural log of each variable will be employed in this and subsequent models. The traditional OLS model is specified as follows:

$$(\ln)E_T = \alpha + \beta_1(\ln)E_B \qquad (5.7)$$

where: E_T and E_B are defined as above
α is a constant or y-intercept term
β_1 is a regression coefficient representing the economic base relationship

This initial model will be used not only to estimate the relationship between total economic activity (dependent variable) and basic economic activity (independent variable), but to carry out diagnostics for spatial effects on variables and residuals. For the sake of comparison, diagnostic tests will be performed using the spatial-economic weights matrix specified above, as well as a traditional spatial weights matrix based on nearest neighbors. Assuming spatial effects are present, spatial regression techniques will be employed to correct the model and (hopefully) obtain unbiased, consistent estimates of model parameters. In addition, incorporation of spatial effects will facilitate identification of spillover effects among *municipios* and account for the varying magnitude of economic base multipliers.

Results of the diagnostic tests mentioned above will determine what kind of spatial econometric model best represents the economic base relationship at the *municipio* level in Yucatán. In general, four possible model outcomes exist: no spatial effects; spatial lag effects; spatial error effects; and a combination of spatial lag and spatial error effects. Each of these potential outcomes is discussed below.

In the event of no spatial effects, the simple OLS model above (Equation 5.7) may be employed to represent to economic base relationship at the local scale in Yucatán. In this instance, no spatial autocorrelation will be found among model residuals. As with all econometric models, however, issues of heteroskedasticity and non-normality of residuals must be taken into account.

Spatial lag effects are present in OLS models when a substantive process (spatial interaction, for example) brings about autocorrelation in model residuals (Anselin, 1988). In this instance, inclusion of a spatially lagged (dependent or independent) variable eliminates spatial dependence among the error terms. The spatially lagged dependent variable model may be specified as follows:

$$(\ln)E_T = \alpha + \beta_1(\ln)E_B + \beta_2 W(\ln)E_T \tag{5.8}$$

where: E_T, α, and E_B are defined as above
W represents the spatial-economic weights matrix
β_1 represents the direct impacts of basic activity within the *municipio*
β_2 corresponds to indirect impacts of economic activity in other *municipios*

The model with a spatially lagged dependent variable is analogous to a (mixed) autoregressive model in time-series analysis. This spatial lags model offers a theoretically sound, intuitive approach for modeling spatial multiplier (feedback) effects among *municipios* in Yucatán. The initial independent variable $(\ln)E_B$ captures the direct impacts of basic activity within the region on total regional employment. The lagged dependent variable $(W(\ln)E_T)$ captures the indirect impacts of employment in other locations on total employment within a given *municipio*.

According to Anselin and Bera (1998), spatial error effects are a form of "nuisance dependence" in the residuals that frequently results in geographic data when administrative boundaries (used for data collection) do not coincide with the substantive process being modeled. The spatial errors model takes the following form:

$$(\ln)E_T = \alpha + \beta_1(\ln)E_B + \lambda Wu + \varepsilon \qquad (5.9)$$

where: E_T, α, and E_B and W are defined as above
u represents the spatially correlated component of the residuals
λ is an autoregressive error parameter
ε is a normally distributed, uncorrelated error term

The possibility exists that both spatial lag and spatial error effects will be present in OLS residuals simultaneously. The resulting model has been termed SARMA (Spatial AutoRegressive Moving Average model) by some scholars (Cliff and Ord, 1981) and may be expressed as follows:

$$(\ln)E_T = \alpha + \beta_1(\ln)E_B + \beta_2 W_1(\ln)E_T + \lambda W_2 u + \varepsilon \qquad (5.10)$$

where: W_1 is the spatial economic weights matrix
W_2 is a spatial weights matrix based on simple contiguity
u represents the spatially correlated component of the residuals
λ is an autoregressive error parameter
ε is a normally distributed, uncorrelated error term

5.2.3.7 Objectives of spatial econometric modeling

One of the primary objectives of this dissertation is to determine if proliferation of export-oriented industrialization in a given *municipio* affects economic activity in neighboring locations. In the event that spatial multiplier effects are present, this study also seeks to quantify potential economic impacts. Spatial econometric techniques facilitate these goals in three ways: identifying the presence of spatial effects; determining the causal factors of spatial effects; and correcting the economic base model for these spatial effects. In identifying the presence of spatial effects, spatial econometrics tests the hypothesis that *maquiladora* production in one location influences the economies of neighboring locations. In determining the causal factors of spatial effects, spatial econometrics reveals whether spillovers are the result of spatial interaction among *municipios* or a consequence of spatial mismatch. Finally, in accounting for these potential spillovers, spatial econometrics quantifies the impact of export-oriented industrialization in a given location on neighboring communities.

Chapter Six

THE IMPACT OF *MAQUILADORA* PRODUCTION ON YUCATAN'S ECONOMY

6.1 Introduction

The direct effects of export-oriented firms on Yucatan's economy were identified in Chapter Four. A more complete indication of the economic importance of *maquiladora* industries can be obtained only if the impact of secondary purchases of goods and services by firms and households is considered. In addition, the geographic distribution of these economic impacts must be estimated in order to assess the viability of EOI as a regional development strategy in the case of Yucatán. As mentioned above, inter-regional input-output analysis and spatial econometric techniques facilitate assessment of these impacts. The detailed results of IRIO analysis, followed by the results of spatial econometric models, are presented immediately below. The formal hypotheses and research questions presented in Chapter One will be addressed in the following chapter.

6.2 Regional economic impacts of *maquiladora* production

Regional input-output tables for 1988, 1993 and 1998, as well as resulting output, income and employment multipliers for all 18 sectors of Yucatán's economy, are found in Appendix D. Table 6.1 below provides these data for *maquiladora* industries.

YEAR	Output	Income	Employment
1988	1.218	1.359	1.151
1993	1.405	1.511	1.102
1998	1.322	1.591	1.113

Table 6.1 Regional multipliers for *maquiladora* industries – 1988, 1993 and 1998

In general, multipliers reveal a fair degree of stability during the ten-year period. The impact of export-oriented firms on output and income has increased somewhat since 1988; employment generation effects, however, have declined slightly. As of 1998, for every dollar of output, *maquiladora* industries in Yucatán generated about 32 cents of additional output within the state. In addition, each dollar of salaries and benefits produced almost 60 cents of additional income. Furthermore, for every 100 jobs in maquiladora industries, approximately 11 additional jobs were created in Yucatán's economy. Therefore, based on these regional multipliers and the direct economic impacts estimated in Chapter Four, export-oriented industries in Yucatán generated almost $2 billion of additional output, more than $51 million of additional income, and about 4300 jobs in the state economy during 2000.

SECTOR	1988	1993	1998
Agriculture	0.01282	0.019515	0.010112
Mining	6.27E-05	3.161E-05	4.268E-06
Food products	0.01046	0.014128	0.011191
Textile products	0.00900	0.004050	0.00345
Wood products	0.00194	0.001372	0.000710
Paper products	0.00185	0.001637	0.000794
Chemical products	0.00192	0.000818	0.000453
Non-metallic products	0.00093	0.00037	8.567E-05
Basic metal products	0.00036	6.723E-06	0.000172
Machinery and equipment	0.00086	0.001020	0.001307
Other manufacturing	0.00046	0.0007639	0.000562
Construction	0	0	0
Public utilities	0.00880	0.015045	0.015066
Commerce, hotels and restaurants	0.04832	0.060453	0.041160
Transportation and communications	0.03485	0.066800	0.062506
Financial services and real estate	0.02355	0.088301	0.066255
Personal and professional services	0.06218	0.130490	0.108198
Maquiladora industries	1	1	1
TOTAL	1.218	1.405	1.322

Table 6.2 Disaggregation of output multipliers for *maquila* industries

Table 6.2 above disaggregates the impacts of export-oriented production on output in Yucatán's economy by sector. As expected, the largest impact of these firms is concentrated among the producer services mentioned in Chapter Three. In fact, producer services account for more than 90 percent of direct, indirect and induced effects for 1998 (29.3 cents out of 32.2 cents). Although *maquiladoras* do not directly consume goods from primary and secondary industries (sectors 1 to 12) of Yucatán's economy, they indirectly consume almost three cents of such commodities for every dollar of output. Much of this demand is "induced" by household purchases of *maquiladora* employees.

The disaggregate output multipliers displayed above represent backward linkages between export-oriented firms and the domestic economy. In general, these linkage relationships remain relatively "stable" between 1988 and 1998. Service industries, however, exhibit somewhat stronger linkages with *maquiladoras* over time; purchases from most primary and secondary sectors of Yucatán's economy declined slightly.

SECTOR	1988	1993	1998
Agriculture	58.5	30.2	25.1
Mining	0.0	0.0	0.0
Food products	5.6	5.1	4.2
Textile products	3.6	5.3	6.5
Wood products	1.7	0.8	0.8
Paper products	1.1	1.0	0.9
Chemical products	1.1	0.4	0.5
Non-metallic products	0.3	0.1	0.0
Basic metal products	0.0	0.0	0.0
Machinery and equipment	1.1	0.7	0.9
Other manufacturing	0.1	0.3	0.4
Construction	0.0	0.0	0.0
Public utilities	9.1	2.9	8.6
Commerce, hotels and restaurants	23.2	24.5	24.3
Transportation and communications	9.4	8.2	9.6
Financial services and real estate	1.1	1.0	3.2
Personal and professional services	35.2	21.4	28.2
TOTAL	151	102	113

Table 6.3 Employment generation effects for every 1000 *maquiladora* jobs

The employment generation effects of export-oriented industrialization are also concentrated among service industries (Table 6.3). In 1998, almost two-thirds of all jobs created in Yucatán's economy were concentrated in the tertiary sector. The *maquila* sector also generates a significant number of jobs in agriculture, food products, and textile products. Again, these impacts are largely the result of the demand created by households employed in *maquiladora* industries.

YEAR	Output	Income	Employment
1988	1.247	1.359	1.139
1993	1.406	1.526	1.096
1998	1.324	1.603	1.111

Table 6.4 Inter-regional input-output multipliers for *maquiladora* industries (Mérida)

6.3 Inter-regional impacts of *maquiladora* production

Inter-regional IO tables for 1988, 1993 and 1998, as well as corresponding sectoral multipliers for both regions of Yucatán, are also included in Appendix E. Tables 6.4 and 6.5 display IRIO multipliers for *maquiladora* industries in urban and rural regions, respectively. As discussed below, differences in input-output multipliers are quite small.

YEAR	Output	Income	Employment
1988	1.119	1.421	1.270
1993	1.420	1.556	1.131
1998	1.328	1.618	1.134

Table 6.5 Inter-regional input-output multipliers for *maquiladora* industries (rural areas)

With respect to output and employment generation, inter-regional input-output analysis indicates that the multiplier effects of export-oriented firms are slightly greater in rural areas than in Mérida. *Maquiladoras* in Mérida also generate somewhat less additional income than similar firms in rural *municipios*. Based on IRIO multipliers and the direct economic impacts identified in Chapter Four, export-oriented firms in Mérida created about $1 billion in additional output, $18 million in income, and more than 1500 new jobs in the state's economy in 2000. *Maquilas* in rural areas accounted for about $1.5 billion in additional production, $30 million in salaries and benefits, and about 2800 employment opportunities.

YEAR	Output	Income	Employment
1988	82.2%	78.3%	49.6%
1993	86.9%	82.6%	57.7%
1998	89.4%	73.4%	59.3%

Table 6.6 Intra-regional distribution of *maquiladora* impacts (Mérida)

Although the aggregate inter-regional input-output multipliers are quite similar for both urban and rural regions, the geographic distribution of these impacts is very different. As shown in Table 6.6 above, the vast majority of additional output and income generated by *maquiladoras* in Mérida remains within the urban core. About one-half of the jobs created indirectly by export-oriented firms are occupied by residents of the state capital (Table 6.6).[1]

YEAR	Output	Income	Employment
1988	21.9%	73.0%	63.3%
1993	17.4%	66.0%	55.5%
1998	13.4%	65.7%	50.7%

Table 6.7 Intra-regional distribution of *maquiladora* impacts (rural areas)

In the case of rural areas, a much smaller share of output generated by *maquiladoras* remains within the region (Table 6.7). This result occurs, in part, because the only direct purchases made by export-oriented firms in Yucatán are producer services. As mentioned in Chapter Five, these services are purchased exclusively in Mérida. The bulk of additional income generated by *maquila* industries remains within rural areas, though less than in Mérida. In addition, the majority of jobs created by export-oriented firms in rural *municipios* are also found outside Yucatán's urban core.

[1] Analysis in this chapter makes reference to the "indirect" impacts of export-oriented firms. Strictly speaking, impacts are created "indirectly" by *maquiladoras* and "induced" by household expenditures.

Inter-regional input-output multipliers may also be disaggregated according to sector. As Table 6.8 below indicates, *maquiladora* firms in Mérida promote additional demand for a variety of services within the region, as well as agricultural products and some limited personal services in rural areas. By and large, the majority of intra-regional impacts are the result of inter-industry transactions; inter-regional effects occur mainly as a result of the final demand exercised by households. Backward linkages of export-oriented firms in Mérida demonstrate substantial stability over time. In general, changes in linkages with sectors of the urban and rural economies confirm insights gleaned from Table 6.6 – intra-regional linkages, particularly with service industries, strengthened between 1988 and 1998. Inter-regional linkages, however, tended to weaken.

REGION	SECTOR	1988	1993	1998
MERIDA	Agriculture	0.00031	0.00092	0.0005
	Mining	1.62E-07	7.202E-06	1.088E-06
	Food products	0.0090	0.00975	0.007727
	Textile products	0.00909	0.00316	0.001792
	Wood products	0.00044	0.00121	0.000696
	Paper products	0.00211	0.00165	0.001034
	Chemical products	0.00111	0.00076	0.000403
	Non-metallic products	0.00088	0.00029	6.455E-05
	Basic metal products	0.00041	6.63E-06	0.000174
	Machinery and equipment	0.00089	0.00089	0.000623
	Other manufacturing	0.00030	0.00070	0.000508
	Construction	0	0	0
	Public utilities	0.00924	0.01403	0.014136
	Commerce, hotels and restaurants	0.04822	0.05300	0.038162
	Transportation and communications	0.03527	0.06096	0.056282
	Financial services and real estate	0.02528	0.08809	0.067479
	Personal and professional services	0.06048	0.11728	0.099798
RURAL	Agriculture	0.01301	0.01578	0.011282
	Mining	7.058E-05	2.184E-05	2.705E-06
	Food products	0.00183	0.00229	0.002461
	Textile products	0.00129	0.00100	0.000934
	Wood products	0.00180	0.00020	0.000149
	Paper products	1.444E-05	3.599E-05	4.291E-05
	Chemical products	0.00109	6.932E-05	4.353E-05
	Non-metallic products	0.00018	7.998E-05	8.557E-06
	Basic metal products	4.589E-06	0	1.528E-08
	Machinery and equipment	9.425E-05	0.00014	0.000417
	Other manufacturing	0.0002	8.382E-05	1.034E-05
	Construction	0	0	0
	Public utilities	0.00074	0.00102	0.000708
	Commerce, hotels and restaurants	0.00698	0.00817	0.005656
	Transportation and communications	0.0044	0.00685	0.002845
	Financial services and real estate	0.00162	0.00177	0.00155
	Personal and professional services	0.01053	0.01548	0.008284
	TOTAL	1.247	1.406	1.324

Table 6.8 Inter-regional distribution of *maquiladora* impacts on output (Mérida)

The geographic distribution of inter-regional impacts is quite similar for export-oriented firms located in rural areas (Table 6.9 below). In general, *maquiladoras* in rural *municipios* generate substantial inter-regional demand for producer services and food products, and intra-regional demand for agricultural commodities. Backward linkages also display a fair degree of stability between 1988 and 1998. Although inter-regional linkages strengthened during this time (confirming results of Table 6.7), intra-regional purchases, especially among service industries, also increased somewhat over the ten-year period.

REGION	SECTOR	1988	1993	1998
MERIDA	Agriculture	0.00029	0.00207	0.000905
	Mining	8.252E-08	1.202E-05	9.977E-07
	Food products	0.00878	0.02219	0.013694
	Textile products	0.00358	0.00286	0.001644
	Wood products	0.00018	0.00110	0.000636
	Paper products	0.00083	0.00149	0.000947
	Chemical products	0.00048	0.00077	0.000372
	Non-metallic products	0.00040	0.00030	5.892E-05
	Basic metal products	0.00019	6.936E-06	0.000171
	Machinery and equipment	0.00039	0.00091	0.000606
	Other manufacturing	0.00012	0.00061	0.000458
	Construction	0	0	0
	Public utilities	0.00431	0.01369	0.013972
	Commerce, hotels and restaurants	0.02094	0.05188	0.037262
	Transportation and communications	0.01558	0.05769	0.054331
	Financial services and real estate	0.01082	0.08158	0.063752
	Personal and professional services	0.02617	0.10947	0.095228
RURAL	Agriculture	0.01250	0.03546	0.0203486
	Mining	3.595E-05	3.647E-05	2.480E-06
	Food products	0.00178	0.00521	0.004362
	Textile products	0.00051	0.00090	0.000857
	Wood products	0.00072	0.00017	0.000136
	Paper products	5.69E-06	3.265E-05	3.930E-05
	Chemical products	0.00046	7.026E-05	4.031E-05
	Non-metallic products	8.498E-05	8.199E-05	7.810E-06
	Basic metal products	2.105E-06	0	1.495E-08
	Machinery and equipment	4.084E-05	0.00014	0.000406
	Other manufacturing	9.324E-05	7.564E-05	9.459E-06
	Construction	0	0	0
	Public utilities	0.00030	0.00095	0.000663
	Commerce, hotels and restaurants	0.00295	0.00794	0.005423
	Transportation and communications	0.00178	0.00628	0.002639
	Financial services and real estate	0.00065	0.00162	0.001442
	Personal and professional services	0.00423	0.01410	0.007663
	TOTAL	1.119	1.420	1.328

Table 6.9 Inter-regional distribution of *maquiladora* impacts on output (rural areas)

The geographic distribution of employment generation by *maquiladoras* also displays similar patterns. In the case of export-oriented firms in Mérida, intra-regional job creation effects are strongest in service industries. However, a significant number of local jobs are also created in agriculture, food products and textile products. In general, the most obvious inter-regional job creation impact of *maquiladora* production in Mérida is expansion of the agricultural sector in rural areas. The EOI strategy also has a noticeable effect on inter-regional employment in commercial establishments, food products, textiles and personal services.

REGION	SECTOR	1988	1993	1998
MERIDA	Agriculture	2.4	1.2	1.2
	Mining	0.0	0.0	0.0
	Food products	3.3	2.9	2.1
	Textile products	2.3	3.4	2.2
	Wood products	0.9	0.6	0.6
	Paper products	1.0	0.7	1.1
	Chemical products	0.6	0.3	0.5
	Non-metallic products	0.2	0.1	0.0
	Basic metal products	0.0	0.0	0.0
	Machinery and equipment	0.9	0.5	0.6
	Other manufacturing	0.0	0.2	0.3
	Construction	0.0	0.0	0.0
	Public utilities	6.9	2.4	5.0
	Commerce, hotels and restaurants	16.1	17.4	18.5
	Transportation and communications	6.8	7.4	7.6
	Financial services and real estate	0.8	0.7	2.6
	Personal and professional services	26.7	17.6	23.7
RURAL	Agriculture	49.6	24.7	28.0
	Mining	0.0	0.0	0.0
	Food products	1.7	1.5	1.7
	Textile products	1.3	2.0	2.9
	Wood products	0.8	0.2	0.3
	Paper products	0.0	0.3	0.1
	Chemical products	0.5	0.1	0.1
	Non-metallic products	0.1	0.0	0.0
	Basic metal products	0.0	0.0	0.0
	Machinery and equipment	0.1	0.2	0.1
	Other manufacturing	0.1	0.1	0.0
	Construction	0.0	0.0	0.0
	Public utilities	1.1	0.3	1.0
	Commerce, hotels and restaurants	6.0	6.4	5.7
	Transportation and communications	1.8	0.9	1.2
	Financial services and real estate	0.2	0.2	0.6
	Personal and professional services	6.9	3.7	3.6
	TOTAL	139	96	111

Table 6.10 Inter-regional distribution of jobs created (per 1000 *maquila* jobs in Mérida)

Export-oriented production in rural areas has positive effects on a number of sectors of the urban economy. Impacts are mainly concentrated in two areas – agriculture and food products and service industries (particularly, commerce and personal and professional services). Intra-regional job creation effects as are most prominent in four sectors – agriculture, food products, commerce and personal and professional services. Almost one-half of the total employment generated by rural *maquiladoras* (and about 80 percent of intra-regional employment) is found in agriculture.

REGION	SECTOR	1988	1993	1998
MERIDA	Agriculture	7.0	2.7	2.2
	Mining	0.0	0.0	0.0
	Food products	9.5	6.5	3.7
	Textile products	2.7	3.1	2.1
	Wood products	1.1	0.6	0.6
	Paper products	1.2	0.7	1.0
	Chemical products	0.7	0.3	0.4
	Non-metallic products	0.3	0.1	0.0
	Basic metal products	0.1	0.0	0.0
	Machinery and equipment	1.2	0.5	0.5
	Other manufacturing	0.0	0.2	0.3
	Construction	0.0	0.0	0.0
	Public utilities	9.6	2.3	4.9
	Commerce, hotels and restaurants	21.0	17.1	18.0
	Transportation and communications	9.0	7.0	7.3
	Financial services and real estate	1.1	0.7	2.5
	Personal and professional services	34.6	16.5	22.6
RURAL	Agriculture	142.9	55.5	50.6
	Mining	0.0	0.0	0.0
	Food products	4.9	3.3	3.0
	Textile products	1.5	1.8	2.7
	Wood products	0.9	0.2	0.3
	Paper products	0.0	0.3	0.1
	Chemical products	0.6	0.1	0.1
	Non-metallic products	0.1	0.0	0.0
	Basic metal products	0.0	0.0	0.0
	Machinery and equipment	0.2	0.2	0.1
	Other manufacturing	0.1	0.1	0.0
	Construction	0.0	0.0	0.0
	Public utilities	1.4	0.3	0.9
	Commerce, hotels and restaurants	7.5	6.3	5.5
	Transportation and communications	2.1	0.8	1.1
	Financial services and real estate	0.3	0.2	0.5
	Personal and professional services	8.3	3.4	3.3
	TOTAL	270	131	134

Table 6.11 Inter-regional distribution of jobs created (per 1000 jobs in rural *maquilas*)

6.4 Impacts of *maquiladora* production on gross state product

The outcomes above suggest two preliminary conclusions. In general, export-oriented industries have a substantial overall impact on Yucatán's economy. In addition, although aggregate multiplier effects are similar in both urban and rural regions of the state, the geographic distribution of these outcomes differs markedly. These initial results do not provide any real indication of the impact of *maquiladora* production on economic growth in Yucatán, however. In this section, the output multipliers discussed above will be utilized to estimate the contribution of export-oriented industrialization to Yucatán's gross state product (GSP) between 1990 and 2000.

INEGI provides gross state product data for Yucatán for 1988 and for 1993 through 1999 (INEGI, 2001). In order to carry out the analysis proposed above, then, GSP must be estimated for 1990, 1991, 1992 and 2000. In order to calculate GSP, a simple trend model was calibrated regressing the natural log of GSP against the corresponding year. The results of this model are presented below.

$$\mathbf{(ln)GSP} = -440.905 + 0.2295\mathbf{Year}$$
$$\qquad\qquad 9.884 \qquad 0.0050$$
$$\mathbf{Adj.\ R^2} = 0.997 \qquad \mathbf{F}_{(1,6)} = 2145.721 \qquad \mathbf{p} = 0.0000$$

Although only eight observations were available to estimate the model, the simple trend explains almost all of the variation in annual gross state product. Therefore, it may be employed to estimate missing values. The second column of Table 6.12 below shows gross state product for Yucatán (in thousands of pesos) for 1990 to 2000. While growth in GSP during this period certainly seems impressive, it is overstated due to the fact that the Mexican peso was devalued several times during the 1990s – from about 2.8 pesos per dollar in 1990 to about 9.3 pesos per dollar in 2000 (INEGI, 2001).

Year	GSP	*Maquila* GSP	Pct. GSP
1990	7,186,421	41,093	0.57%
1991	9,040,251	61,454	0.68%
1992	11,372,301	81,250	0.71%
1993	15,029,646	90,008	0.60%
1994	17,218,056	110,689	0.64%
1995	20,898,510	179,828	0.86%
1996	29,029,150	336,583	1.16%
1997	36,895,171	547,572	1.48%
1998	45,777,958	1,005,856	2.20%
1999	56,711,465	1,942,166	3.42%
2000	71,316,656	3,106,954	4.36%

Table 6.12 Direct contribution of *maquiladora* production to GSP, 1990 to 2000

Table 6.12 also indicates total value of gross state product corresponding to *maquiladora* industries in Yucatán between 1990 and 2000 (INEGI, 2001). These figures have been termed GSP because they correspond only to the value added of export-oriented production that remains in Yucatán. The final column indicates the contribution of the *maquila* sector to the state's economy. Clearly, export-oriented firms have become an increasingly important segment of Yucatán's economy, now accounting for more than four percent of total state income.

Year	GSP	*Maquila*	Multiplier	Total *Maquila*	Pct GSP	Pct Change
1990	7,186,421	41,093	1.218	50,051	0.70%	
1991	9,040,251	61,454	1.405	86,343	0.96%	1.96%
1992	11,372,301	81,250	1.405	114,156	1.00%	1.19%
1993	15,029,646	90,008	1.405	126,461	0.84%	0.34%
1994	17,218,056	110,689	1.405	155,518	0.90%	1.33%
1995	20,898,510	179,828	1.405	252,658	1.21%	2.64%
1996	29,029,150	336,583	1.322	444,963	1.53%	2.37%
1997	36,895,171	547,572	1.322	723,890	1.96%	3.55%
1998	45,777,958	1,005,856	1.322	1,329,742	2.90%	6.82%
1999	56,711,465	1,942,166	1.322	2,567,543	4.53%	11.32%
2000	71,316,656	3,106,954	1.322	4,107,393	5.76%	10.54%

Table 6.13 Total contribution of *maquiladora* production to GSP, 1990 to 2000

The information above represents only the direct impacts of export-oriented production on the regional economy. If the output multipliers in Table 6.1 are taken into account, it is possible to estimate the total (direct, indirect and induced) effects of *maquiladora* production on Yucatán's economy. These data are presented in Table 6.13 above.

When multiplier effects are considered, export-oriented production contributes almost six percent of Yucatán's gross state product. However, the final column of the above table provides perhaps the most telling insight into the relative importance of the EOI strategy. In general, between 1991 and 2000, *maquiladoras* have accounted for a greater and greater share of the annual change in Yucatán's GSP. In 1999 and 2000, these firms accounted for about 11 percent of the change in the total value of goods and services produced in the state's economy.

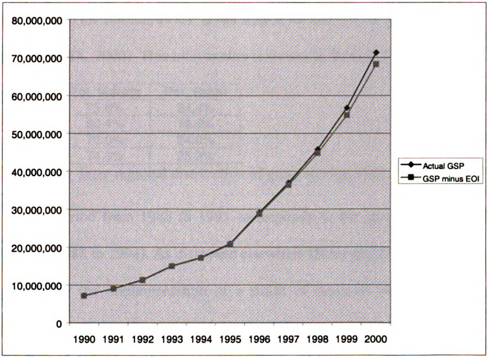

Figure 6.1 Overall contribution of *maquiladoras* to Yucatán GSP, 1990-2000

Based on the data in Table 6.13 above, it is possible to estimate the growth of Yucatán's economy between 1990 and 2000 had the EOI strategy not been implemented.

In basic terms, GSP may be adjusted by removing the total (direct, indirect and induced) effects of *maquiladora* production during a given year and the annual change in total *maquiladora* effects between 1991 and 2000. This information is displayed in Figure 6.1 above. Had the EOI strategy not been pursued, Yucatán's economy would have been almost five percent smaller by 2000 – in other words, average income at the state level would have declined by more than $150 (US) per person.

6.5 Impacts of *maquiladora* production on the inter-regional distribution of GSP

The inter-regional distribution of GSP impacts may also be identified. The Economic Censuses of 1989, 1994 and 1999 allow GSP to be disaggregated by region. In addition, the *Banco Nacional de México* (Division of Economic and Social Research) provides information on Yucatán's GSP at the state level and for the *municipio* of Mérida for 2000 (BANAMEX, 2000). This information is shown in Table 6.14 below.

Year	Pct. Mérida	Pct. Rural
1988	75.6%	24.4%
1993	80.4%	19.6%
1998	76.0%	24.0%
2000	74.8%	25.2%

Table 6.14 Inter-regional distribution of gross state product

The period from 1988 to 1993 corresponds to the presidency of Carlos Salinas de Gortari (1988 to 1994). As discussed elsewhere (Biles and Pigozzi, 2000), this period was marked by the implementation of a series of dramatic neo-liberal economic reforms purportedly designed to promote development in rural areas of Mexico. In reality, these policies induced greater relative growth in urban locations. The increasing concentration of economic activity in Mérida during this time may provide some empirical evidence of the impact of these reforms in the case of Yucatán. Although Mérida still accounts for almost three-quarters of all economic activity in the state, during the past eight years rural areas have represented a greater and greater share of Yucatán's gross state product.

Using the IRIO multipliers discussed above, it is possible to determine the overall impact of *maquiladora* production on urban and rural economies. As indicated in Table 6.14, inter-regional distribution of gross state product information is available only for 1988, 1993, 1998 and 2000. Therefore, missing values must be interpolated. These data are shown in Table 6.15.

YEAR	Mérida	Rural areas
1990	77.5%	22.5%
1991	78.4%	21.6%
1992	79.4%	20.6%
1993	80.4%	19.6%
1994	79.5%	20.5%
1995	78.6%	21.4%
1996	77.7%	22.3%
1997	76.9%	23.1%
1998	76.0%	24.0%
1999	75.4%	24.6%
2000	74.8%	25.2%

Table 6.15 Distribution of Yucatán's gross state product by region, 1990-2000

Using the annual gross state product data from Table 6.12 above, it is now possible to apportion economic activity by region. Tables 6.16 and 6.17 below reveal gross regional product for both urban and rural areas of Yucatán, respectively.

Year	GRP Mérida	*Maquila*	Multiplier	Total *Maquila*	Pct GRP	Pct Change
1990	5,569,476	32,210	1.247	40,165	0.72%	
1991	7,087,557	48,169	1.406	67,726	0.96%	1.82%
1992	9,029,607	63,685	1.406	89,542	0.99%	1.12%
1993	12,083,835	66,547	1.406	93,566	0.77%	0.13%
1994	13,688,355	81,838	1.406	115,064	0.84%	1.34%
1995	16,426,229	99,841	1.406	140,376	0.85%	0.92%
1996	22,555,650	183,387	1.324	242,804	1.08%	1.67%
1997	28,372,386	249,195	1.324	329,934	1.16%	1.50%
1998	34,791,248	395,814	1.324	524,058	1.51%	3.02%
1999	42,760,445	738,384	1.324	977,620	2.29%	5.69%
2000	53,344,859	1,221,116	1.324	1,616,758	3.03%	6.04%

Table 6.16 Total contribution of *maquiladora* production to GRP in Mérida

Although the results for Mérida indicate the increasing importance of export-oriented production in the city's economy, *maquiladoras* comprise a relatively small, but increasingly important, segment of the local economy (about three percent). However, the EOI strategy has had fairly prominent effects on annual changes in gross regional product between 1990 and 2000.

As displayed in Table 6.17 below, the relative impacts of export-oriented industrialization are much greater in the case of rural *municipios*. By 2000, these firms accounted for almost 14 percent of all goods and services produced in rural areas. In addition, more than one-fifth of the change in regional income during the past two years is attributable to the growth of *maquiladora* industries in the countryside.

Year	GRP Rural	*Maquila*	Multiplier	Total *Maquila*	Pct GRP	Pct Change
1990	1,616,945	8,883	1.119	9,941	0.61%	
1991	1,952,694	13,285	1.420	18,865	0.97%	2.66%
1992	2,342,694	17,565	1.420	24,942	1.06%	1.56%
1993	2,945,811	23,461	1.420	33,314	1.13%	1.39%
1994	3,529,701	28,851	1.420	40,968	1.16%	1.31%
1995	4,472,281	79,987	1.420	113,582	2.54%	7.70%
1996	6,473,500	153,196	1.328	203,444	3.14%	4.49%
1997	8,522,785	298,377	1.328	396,245	4.65%	9.41%
1998	10,986,710	610,042	1.328	810,136	7.37%	16.80%
1999	13,951,020	1,203,782	1.328	1,598,622	11.46%	26.60%
2000	17,971,797	1,885,838	1.328	2,504,393	13.94%	22.53%

Table 6.17 Total contribution of *maquiladora* production to rural GRP

The contribution of *maquiladora* production to the inter-regional distribution of gross regional product (as shown in Tables 6.16 and 6.17) is somewhat misleading because it does not account for leakage effects. As discussed in section 6.3 above, the multiplier effects of export-oriented firms are much more likely to remain in Mérida than in rural areas. Therefore, to truly assess the inter-regional implications of *maquiladora* production on regional income, "leakage" effects must be taken into account. As shown in Table 6.18 below, due to these leakage effects, the importance of export-oriented production is underestimated in the case of Mérida and overestimated in the case of rural *municipios*.

	RURAL			MERIDA			ADJUSTED IMPACTS	
Year	Direct	Total Local	Leakage	Direct	Total Local	Leakage	Total Mérida	Total Rural
1990	8,883	9,114	826	32,210	38,750	1,416	39,576	10,530
1991	13,285	14,256	4,609	48,169	65,164	2,562	69,773	16,818
1992	17,565	18,849	6,094	63,685	86,154	3,387	92,248	22,236
1993	23,461	25,176	8,139	66,547	90,026	3,539	98,165	28,715
1994	28,851	30,959	10,009	81,838	110,712	4,353	120,721	35,312
1995	79,987	85,832	27,749	99,841	135,066	5,310	162,815	91,142
1996	153,196	159,929	43,515	183,387	236,506	6,298	280,021	166,227
1997	298,377	311,491	84,753	249,195	321,376	8,558	406,129	320,049
1998	610,042	636,855	173,281	395,814	510,464	13,594	683,745	650,449
1999	1,203,782	1,256,691	341,932	738,384	952,261	25,359	1,294,193	1,282,050
2000	1,885,838	1,968,724	535,669	1,221,116	1,574,820	41,938	2,110,489	2,010,662

Table 6.18 Adjusted impacts of *maquila* production on GRP due to leakage effects

With these revised multiplier effects, it is now possible to estimate the change in gross regional product for rural and urban areas between 1990 and 2000 had the export-oriented industrialization strategy not been implemented. These results are displayed below in Figures 6.2 and 6.3.

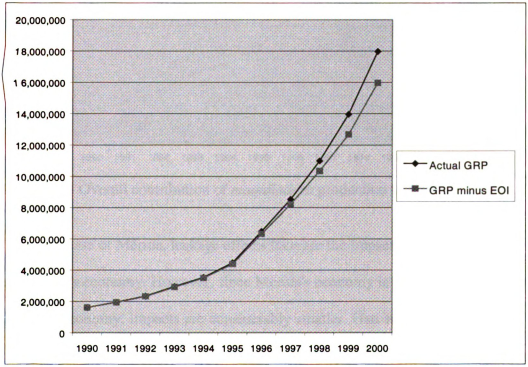

Figure 6.2 Overall contribution of *maquiladora* production to GSP in rural areas

When leakage effects are accounted for, the overall impact of *maquiladora* production on rural economies is considerably weaker (for example, about 50 percent smaller in 2000). However, export-oriented industries still play an extremely important role in the growth of rural *municipios*. As shown above in Figure 6.2, average per capita income would have been more than 11 percent less in 2000 if the EOI strategy had not been adopted.

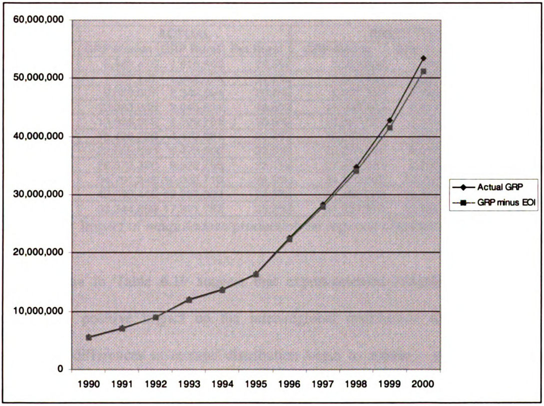

Figure 6.3 Overall contribution of *maquiladora* production to GSP in Mérida

In the case of Mérida, leakage effects increase the impacts of *maquiladora* production on the city's economy. However, since Mérida's economy is about three times larger than the rural economy, impacts are considerably smaller. Had state government not initiated the EOI regional development policy, the average per capita income in the state capital would have been about 3.95 percent smaller in 2000.

As discussed in Chapter Two, one of the criteria proposed to assess the viability of the export-oriented industrialization strategy is its impact on the (geographic) distribution of income in Yucatán. The analysis carried out in this section facilitates assessment of changes in the inter-regional income distribution between 1990 and 2000. Table 6.19 below shows actual gross regional product for urban and rural regions, as well as predicted GRP had the *maquiladora* strategy not been adopted. In addition, regional shares of GRP are also indicated.

	ACTUAL			PREDICTED		
Year	**GRP Mérida**	**GRP Rural**	**Pct Rural**	**GRP Mérida**	**GRP Rural**	**Pct Rural**
1990	5,569,476	1,616,945	22.5%	5,529,900	1,606,415	22.5%
1991	7,087,557	1,952,694	21.6%	7,017,784	1,935,876	21.6%
1992	9,029,607	2,342,694	20.6%	8,937,359	2,320,458	20.6%
1993	12,083,835	2,945,811	19.6%	11,985,670	2,917,096	19.6%
1994	13,688,355	3,529,701	20.5%	13,567,634	3,494,389	20.5%
1995	16,426,229	4,472,281	21.4%	16,263,414	4,381,139	21.2%
1996	22,555,650	6,473,500	22.3%	22,275,629	6,307,273	22.1%
1997	28,372,386	8,522,785	23.1%	27,966,257	8,202,736	22.7%
1998	34,791,248	10,986,710	24.0%	34,107,503	10,336,261	23.3%
1999	42,760,445	13,951,020	24.6%	41,466,252	12,668,970	23.4%
2000	53,344,859	17,971,797	25.2%	51,234,370	15,961,135	23.8%

Table 6.19 Impact of *maquiladora* production on regional distribution of income

The data in Table 6.19 suggest that export-oriented industrialization has had a moderately positive impact on the inter-regional distribution of income. By 1995, noticeable differences in income distribution begin to appear – prior to this time the *maquiladora* sector was too small to affect aggregate income distribution. If Yucatán had not adopted the EOI strategy, only 23.8 percent of economic activity would have been found in rural areas of the state by 2000. Since 25.2 percent of gross state product accrued to rural *municipios* in 2000, the *maquiladora* strategy is responsible for a net shift of approximately 5.6 percent in the inter-regional distribution of income between 1990 and 2000.

6.6 Impacts of *maquiladora* production on regional economic structure

A second criterion proposed in Chapter Two to assess the developmental implications of the EOI strategy is impact on regional economic structure. Several variables could be utilized to assess structural change – total output or value added, for example. Employment by sector, however, will be employed in combination with the inter-regional employment multipliers discussed in section 6.3 to estimate the impacts of *maquiladora* production on structural change at the regional level.

Employment data by region are available for 1988, 1993 and 1998 (INEGI, 2001). Table 6.20 below displays the sectoral distribution of employment by region for each of these years. Some of the basic changes in economic structure were discussed in Chapter Four. However, with respect to rural areas, a substantial degree of structural change appears to have taken place in the regional economy since 1988. Although agriculture still employs almost 50 percent of rural workers, this sector now represents a significantly smaller share of total employment. Textile products, commerce, hotels and restaurants, and personal and professional services now comprise a much greater portion of employment among rural economies (more than 40 percent).

	1988		1993		1998	
SECTOR	Mérida	Rural	Mérida	Rural	Mérida	Rural
Agriculture	5.55%	72.58%	3.61%	64.50%	2.13%	49.27%
Mining	0.48%	0.91%	0.24%	0.64%	0.49%	0.37%
Food products	8.68%	2.87%	9.10%	4.11%	5.08%	4.38%
Textile products	5.29%	1.95%	8.79%	4.44%	6.36%	8.55%
Wood products	1.36%	0.73%	1.21%	0.43%	0.90%	0.56%
Paper products	1.54%	0.02%	1.22%	0.43%	1.12%	0.13%
Chemical products	1.42%	0.72%	1.01%	0.37%	1.19%	0.15%
Non-metallic products	1.98%	0.52%	2.01%	0.74%	0.83%	0.55%
Basic metal products	0.12%	0.00%	0.30%	0.00%	0.17%	0.00%
Machinery and equipment	2.36%	0.24%	2.20%	0.81%	1.75%	0.39%
Other manufacturing	0.07%	0.11%	0.45%	0.17%	0.62%	0.04%
Construction	8.49%	2.47%	3.29%	0.78%	7.19%	2.12%
Public utilities	2.42%	0.70%	1.16%	0.32%	0.95%	0.58%
Commerce, hotels and restaurants	32.00%	9.06%	39.18%	16.27%	26.04%	14.56%
Transportation and communications	4.65%	1.35%	6.18%	1.01%	4.71%	0.51%
Financial services and real estate	0.77%	0.17%	1.01%	0.28%	2.52%	0.36%
Personal and professional services	22.83%	5.59%	19.03%	4.71%	37.93%	17.47%

Table 6.20 Sectoral distribution of employment by region

Some structural change has also occurred in Mérida, though it is much less pronounced than in rural areas. Although commerce, hotels and restaurants and personal and professional services remain the two most important sectors in the state capital, the later industry now comprises almost 38 percent of total employment. Food products and textiles industries continue to generate the most employment among manufacturing sectors, though neither industry displayed much change between 1988 and 1998. As in rural areas, relative employment in agriculture declined sharply during the ten-year period.

In general, then, structural change has taken place in both regions between 1988 and 1998. The objective of this section is to identify the portion of structural change that is attributable to the growth of *maquiladora* industries in urban and rural regions of Yucatán. Some of the techniques applied in section 6.5 above will prove useful in achieving this objective.

The inter-regional employment multipliers displayed in Tables 6.10 and 6.11 disaggregate job creation effects by sector and region. These multipliers may be used in conjunction with Table 6.21 below, which displays annual *maquiladora* employment by region, in order to estimate changes in regional employment between 1990 and 2000.

Year	Rural	Mérida
1990	89	2546
1991	135	3966
1992	790	3870
1993	834	4513
1994	1804	6669
1995	6414	8005
1996	7914	9474
1997	12941	10808
1998	17988	11671
1999	20052	12299
2000	22066	15261

Table 6.21 *Maquiladora* employment by region, 1990-2000

	SECTOR	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Total
MERIDA	Agriculture	1	0	2	0	3	12	3	11	11	5	5	53
	Mining	0	0	0	0	0	0	0	0	0	0	0	0
	Food products	1	0	4	0	6	30	6	19	19	8	8	101
	Textile products	0	0	2	0	3	14	3	10	10	4	4	50
	Wood products	0	0	0	0	1	3	1	3	3	1	1	13
	Paper products	0	0	0	0	1	3	1	5	5	2	2	19
	Chemical products	0	0	0	0	0	1	1	2	2	1	1	8
	Non-metallic products	0	0	0	0	0	0	0	0	0	0	0	0
	Basic metal products	0	0	0	0	0	0	0	0	0	0	0	0
	Machinery and equipment	0	0	0	0	1	2	1	3	3	1	1	12
	Other manufacturing	0	0	0	0	0	1	0	1	1	1	1	5
	Construction	0	0	0	0	0	0	0	0	0	0	0	0
	Public utilities	1	0	2	0	2	11	7	25	25	10	10	93
	Comm., hotels & restaurants	2	1	11	1	17	79	27	91	91	37	36	393
	Transport & communications	1	0	5	0	7	32	11	37	37	15	15	160
	Finance & real estate	0	0	0	0	1	3	4	13	13	5	5	44
	Personal & prof. services	3	1	11	1	16	76	34	113	114	47	45	461
RURAL	Agriculture	13	3	37	2	54	256	76	254	255	104	102	1156
	Mining	0	0	0	0	0	0	0	0	0	0	0	0
	Food products	0	0	2	0	3	15	5	15	15	6	6	67
	Textile products	0	0	1	0	2	8	4	13	13	6	5	52
	Wood products	0	0	0	0	0	1	0	2	2	1	1	7
	Paper products	0	0	0	0	0	1	0	1	1	0	0	3
	Chemical products	0	0	0	0	0	1	0	0	0	0	0	1
	Non-metallic products	0	0	0	0	0	0	0	0	0	0	0	0
	Basic metal products	0	0	0	0	0	0	0	0	0	0	0	0
	Machinery and equipment	0	0	0	0	0	1	0	1	1	0	0	3
	Other manufacturing	0	0	0	0	0	0	0	0	0	0	0	0
	Construction	0	0	0	0	0	0	0	0	0	0	0	0
	Public utilities	0	0	0	0	0	1	1	5	5	2	2	16
	Comm., hotels & restaurants	1	0	4	0	6	29	8	28	28	11	11	126
	Transport & communications	0	0	1	0	1	4	2	5	5	2	2	22
	Finance & real estate	0	0	0	0	0	1	1	3	3	1	1	10
	Personal & prof. services	1	0	2	0	3	16	5	17	17	7	7	75
	TOTAL	24	6	87	6	127	602	202	676	679	278	271	2958

Table 6.22 Employment generation by sector, region and year – rural *maquiladoras*

	SECTOR	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Total
MERIDA	Agriculture	6	2	0	1	3	2	2	2	1	1	4	24
	Mining	0	0	0	0	0	0	0	0	0	0	0	0
	Food products	8	4	0	2	6	4	3	3	2	1	6	39
	Textile products	6	5	0	2	7	5	3	3	2	1	7	41
	Wood products	2	1	0	0	1	1	1	1	1	0	2	10
	Paper products	3	1	0	0	2	1	2	1	1	1	3	15
	Chemical products	1	0	0	0	1	0	1	1	0	0	1	5
	Non-metallic products	1	0	0	0	0	0	0	0	0	0	0	1
	Basic metal products	0	0	0	0	0	0	0	0	0	0	0	0
	Machinery and equipment	2	1	0	0	1	1	1	1	0	0	2	9
	Other manufacturing	0	0	0	0	0	0	0	0	0	0	1	1
	Construction	0	0	0	0	0	0	0	0	0	0	0	0
	Public utilities	18	3	0	2	5	3	7	7	4	3	15	67
	Comm., hotels & restaurants	41	25	-2	11	38	23	27	25	16	12	55	271
	Transport & communications	17	11	-1	5	16	10	11	10	7	5	22	113
	Finance & real estate	2	1	0	0	2	1	4	4	2	2	8	26
	Personal & prof. services	68	25	-2	11	38	24	35	32	20	15	70	336
RURAL	Agriculture	126	35	-2	16	53	33	41	37	24	18	83	464
	Mining	0	0	0	0	0	0	0	0	0	0	0	0
	Food products	4	2	0	1	3	2	2	2	1	1	5	23
	Textile products	3	3	0	1	4	3	4	4	3	2	9	36
	Wood products	2	0	0	0	1	0	1	0	0	0	1	5
	Paper products	0	0	0	0	1	0	0	0	0	0	0	1
	Chemical products	1	0	0	0	0	0	0	0	0	0	0	1
	Non-metallic products	0	0	0	0	0	0	0	0	0	0	0	0
	Basic metal products	0	0	0	0	0	0	0	0	0	0	0	0
	Machinery and equipment	0	0	0	0	0	0	0	0	0	0	0	0
	Other manufacturing	0	0	0	0	0	0	0	0	0	0	0	0
	Construction	0	0	0	0	0	0	0	0	0	0	0	0
	Public utilities	3	0	0	0	1	0	1	1	1	1	3	11
	Comm., hotels & restaurants	15	9	-1	4	14	9	8	8	5	4	17	92
	Transport & communications	5	1	0	1	2	1	2	2	1	1	3	19
	Finance & real estate	1	0	0	0	0	0	1	1	0	0	2	5
	Personal & prof. Services	17	5	0	2	8	5	5	5	3	2	11	63
	TOTAL	354	137	-9	62	207	129	164	149	96	70	330	1689

Table 6.23 Employment generation by sector, region and year – *maquiladoras* in Mérida

Table 6.22 above reveals the inter-regional distribution of employment impacts in the case of rural *municipios*. Between 1990 and 2000, these firms generated more than 2900 jobs in Yucatán's economy. Almost 1600 of the positions were created in rural locations. In addition, nearly 40 percent of all jobs generated are found in rural agriculture. Export-oriented firms in rural areas also promoted notable employment generation effects in personal and professional services in Mérida, as well as commerce, hotels and restaurants in both urban and rural locations.

Table 6.23 above displays the employment generation effects of *maquiladoras* in Mérida by sector and region. Although the aggregate multiplier effects are somewhat smaller, the sectoral and geographic distribution of impacts is quite similar. Overall, export-oriented firms in Mérida generated more than 1600 jobs between 1990 and 2000. More than 25 percent of these jobs are concentrated in rural agriculture. Other prominent effects are found among service industries in the state capital, particularly personal and professional services and commercial establishments. *Maquiladoras* in Mérida also induce job creation in food and textiles industries in both regions and, to a somewhat lesser degree, in rural service establishments.

Total employment generated by export-oriented firms between 1990 and 1998 may be summed by region.[2] Subsequently, it may be "subtracted" from the employment figures for each region (for 1998) to provide an estimate of the impact of *maquiladora* production on structural change. Table 6.23 below shows actual employment for 1998 by region, as well as projected employment had the EOI strategy not been implemented. In both urban and rural areas, the impact of export-oriented production on economic

[2] Employment generation for 1990 includes the effects of all *maquiladora* employment that existed prior to 1990.

structure is very limited. In each case, the jobs created by *maquiladoras* represent a small portion (less than one percent) of total employment. As a consequence, the impact of the EOI strategy on overall economic structure is minimal.

	RURAL AREAS				MERIDA			
	Employment Structure				Employment Structure			
SECTOR	*Actual*	*Predicted*	*Actual*	*Predicted*	*Actual*	*Predicted*	*Actual*	*Predicted*
Agriculture	101569	99949	49.3%	49.0%	4521	4444	2.1%	2.1%
Mining	763	763	0.4%	0.4%	1040	1040	0.5%	0.5%
Food products	9029	8939	4.4%	4.4%	10782	10642	5.1%	5.1%
Textile products	17626	17538	8.6%	8.6%	13499	13408	6.4%	6.4%
Wood products	1154	1142	0.6%	0.6%	1910	1887	0.9%	0.9%
Paper products	268	264	0.1%	0.1%	2377	2343	1.1%	1.1%
Chemical products	309	307	0.2%	0.2%	2526	2513	1.2%	1.2%
Non-metallic products	1134	1134	0.6%	0.6%	1762	1761	0.8%	0.8%
Basic metal products	0	0	0.0%	0.0%	361	361	0.2%	0.2%
Machinery and equipment	804	801	0.4%	0.4%	3714	3693	1.8%	1.8%
Other manufacturing	82	82	0.0%	0.0%	1316	1310	0.6%	0.6%
Construction	4370	4370	2.1%	2.1%	15261	15261	7.2%	7.3%
Public utilities	1196	1169	0.6%	0.6%	2016	1856	1.0%	0.9%
Commerce, hotels and restaurants	30015	29797	14.6%	14.6%	55271	54607	26.0%	26.0%
Transportation and communications	1051	1010	0.5%	0.5%	9997	9724	4.7%	4.6%
Financial services and real estate	742	727	0.4%	0.4%	5349	5279	2.5%	2.5%
Personal and professional services	36014	35876	17.5%	17.6%	80508	79711	37.9%	38.0%

Table 6.24 Impact of *maquiladora* production on economic structure (1998)

It is also possible to assess the impact of *maquiladora* production on employment change between 1988 and 1998. Table 6.24 below displays total employment change by region and sector between 1988 and 1998, as well as job creation effects of export-oriented industries during this same time period. The contribution of EOI to employment change by sector is also quantified for each region.

Although the jobs generated by export-oriented firms do not represent a significant portion of Yucatán's total employment, they do account for a relatively important share of employment change between 1988 and 1998 in both urban and rural regions. In the case of rural *municipios*, significant gains are found in service industries, including public utilities, commerce, hotels and restaurants, and transportation and communications.

Though small in absolute terms, substantial employment gains also occur in several manufacturing industries (food products, textiles, wood products and paper products).

Finally, the most important impact of *maquiladora* production on employment generation in rural areas between 1988 and 1998 is found in agriculture. Had the EOI strategy not be adopted, employment in this sector would have declined to fewer than 100,000 persons. However, employment in Yucatán's export-oriented firms generates income for more than 37,300 persons. Employees spend a portion of this income on foodstuffs and some of these items are produced in rural areas of Yucatán. By generating increased demand for agricultural products, *maquiladora* production indirectly created almost 1700 employment opportunities for farmers between 1988 and 1998. As such, the EOI strategy may have reduced rural-to-urban migration during this period by allowing farmers and their families (and other rural residents, as well) to remain in their local communities.

	RURAL AREAS				MERIDA			
Sector	**1988**	**1998**	***Maquila***	**% Maquila**	**1988**	**1998**	***Maquila***	**% Maquila**
Agriculture	104900	101569	1620	48.63%	5157	4521	77	12.11%
Mining	1310	763	0	0.00%	442	1040	0	0.00%
Food products	4147	9029	90	1.84%	8064	10782	140	5.15%
Textile products	2824	17626	88	0.59%	4910	13499	91	1.06%
Wood products	1055	1154	12	12.12%	1264	1910	23	3.56%
Paper products	34	268	4	1.71%	1431	2377	34	3.59%
Chemical products	1043	309	2	27.00%	1318	2526	13	1.08%
Non-metallic products	748	1134	0	0.00%	1838	1762	1	1.32%
Basic metal products	5	0	0	0.00%	114	361	0	0.00%
Machinery and equipment	346	804	3	0.66%	2189	3714	21	1.38%
Other manufacturing	166	82	0	0.00%	61	1316	6	0.48%
Construction	3564	4370	0	0.00%	7888	15261	0	0.00%
Public utilities	1016	1196	27	15.00%	2250	2016	160	68.38%
Commerce, hotels and restaurants	13093	30015	218	1.29%	29722	55271	664	2.60%
Transportation and communications	1952	1051	41	4.55%	4319	9997	273	4.81%
Financial services and real estate	244	742	15	3.01%	712	5349	70	1.51%
Personal and professional services	8086	36014	138	0.49%	21209	80508	797	1.34%

Table 6.25 Contribution of *maquiladora* industries to employment change, 1988 – 1998

With respect to Mérida, export-oriented production also had some impact on changes in employment structure between 1988 and 1998. In general, the largest absolute impacts are concentrated among tertiary industries such as personal and professional services, commerce, hotels and restaurants, public utilities, and transportation and communications. The EOI strategy also had a relatively important impact on employment change in several manufacturing sectors, including food products, textiles industries, wood products and paper products.

Overall, the employment generated by *maquiladora* production does not have a significant impact on the structure of employment in urban and rural regions of Yucatán's economy. In general, the number of jobs created by such firms (about 4500) is too small to affect the sectoral distribution of employment at the regional level. However, substantial structural change has taken place in Mérida and rural *municipios* since 1988. When employment created by *maquilas* between 1988 and 1998 is evaluated as a share of total employment change by sector and region during the ten-year period, the EOI strategy does exhibit a moderate impact on the structure of employment in both urban and rural areas of Yucatán.

6.7 Impacts of *maquiladora* production on local economies

As discussed above, *maquiladora* production in Yucatán generates substantial inter-regional effects. In addition, export-oriented firms display relatively strong linkages with several sectors (especially producer services) of the regional economy. The preceding analysis, however, has been carried out at a relatively "coarse" geographic scale. In essence, the input-output models implemented above emphasize the sectoral distribution of economic impacts at the expense of geographic detail. In this section, employment data at the *municipio* scale for 1998 will be utilized to estimate spillover effects produced by *maquiladoras* at the local level. Consequently, the spatial econometric models calibrated below focus explicitly on the geographic distribution of economic impacts (at the expense of sectoral detail).

As discussed in Chapter Five, the employment multipliers for Mérida and rural areas may be utilized to partition local employment into two shares – the portion serving local demand (non-basic) and the portion serving demands in other locations (basic). In the case of rural *municipios*, the location quotient approach may be employed to apportion basic and non-basic employment among 105 *municipios*. Once employment has been partitioned, traditional economic base multipliers may be estimated for each of the 106 *municipios* in Yucatán. Economic base multipliers are included in Appendix F and mapped below in Figure 6.4.

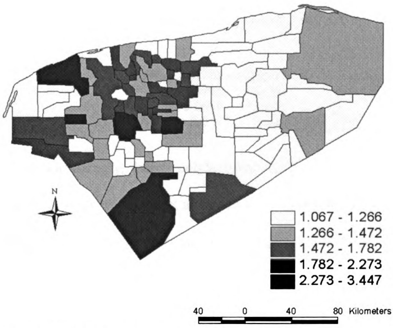

Figure 6.4 Traditional economic base multipliers (1998)

Not surprisingly, the largest multipliers are concentrated in and around Yucatán's urban core. A handful of geographically isolated *municipios* in the southern part of the state, as well as the eastern cities of Valladolid and Tizimín, also display relatively large multipliers. A large area comprised of more than 30 small *municipios* with very small multipliers exists in central and southeast Yucatán. The Moran's I statistic (0.128) indicates weak, though statistically significant (p=0.014), spatial autocorrelation in economic base multipliers at the local scale. The presence of this spatial dependence suggests that some degree of spatial interaction or spillover effects may be taking place with respect to employment generation among neighboring *municipios.*

6.7.1 Calibration of OLS model

Following estimation of basic and non-basic employment at the local scale, a traditional OLS model may be calibrated. The natural log of total employment serves as the dependent variable; the natural log of basic employment is used as the independent variable. The results of the model are shown below.

$$
\begin{array}{lll}
(\ln)E_T = & 0.9753 + & 0.9051(\ln)E_B \\
 & 0.1268 & 0.0186 \\
 & 0.0000 & 0.0000 \\
\end{array}
$$

$$\text{Adj. } R^2 = 0.9577 \qquad F_{(1,104)} = 2375.44 \qquad p = 0.0000$$

Not surprisingly, basic employment accounts for more than 95 percent of the variation in total employment at the *municipio* level. However, the initial OLS model has been carried out primarily for diagnostic purposes. As shown in Figure 6.5 below, model residuals are not normally distributed. This result is confirmed by the Jarque-Bera test (p=0.000). In addition, the Breusch-Pagan test (p=0.0006) indicates the presence of heteroskedasticity among the error terms. The result is corroborated by the plot of residuals against predicted values below (Figure 6.6).

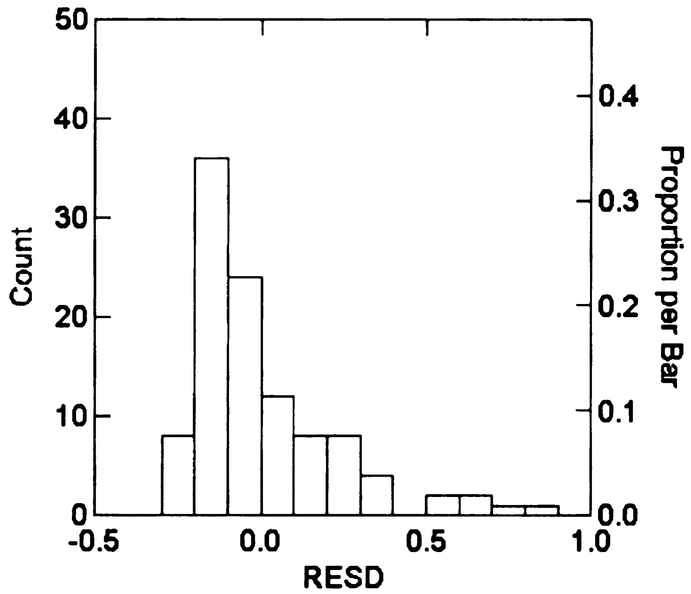

Figure 6.5 Distribution of OLS residuals

An additional violation of fundamental OLS assumptions (though frequently overlooked by researchers in other disciplines) is displayed below in Figure 6.7. Visual inspection of model residuals reveals a cluster of large positive values in and around Mérida, as well as along the boundaries of the study area. Consequently, the OLS model underestimates the level of total employment in these locations. In the case of Mérida and nearby *municipios*, total employment may be under-predicted due to the spillover effects mentioned above. In the case of *municipios* along the edge of the study area, interaction with *municipios* in neighboring states (which will not be addressed in this study) may have a positive impact on total employment.

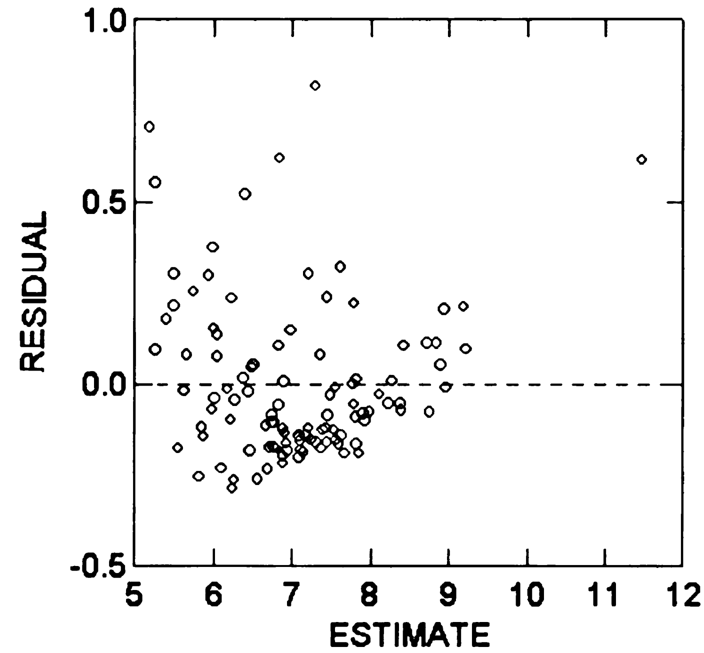

Figure 6.6 Plot of residuals against predicted values (OLS model)

Based on the spatial-economic weights introduced in Chapter Five, the Moran's I test (I=0.1449) confirms the statistical significance of spatial autocorrelation among model residuals (p=0.0000). This result is corroborated by Lagrangian multiplier tests (p=0.0155), which indicate the presence of spatial lag effects among error terms. Diagnostic tests also suggest a weak degree of spatial error dependence (Moran's I = 0.0986) among residuals based on nearest neighbors. However, this spatial autocorrelation is not highly statistically significant (p=0.0542). Since spatial lag effects are statistically significant, the initial spatial econometric model calibrated below will account for these effects. Subsequently, diagnostic tests will be performed to determine if significant spatial error effects remain in model residuals. In the event that spatial dependence persists, an alternative model (SARMA, for example) will be calibrated.

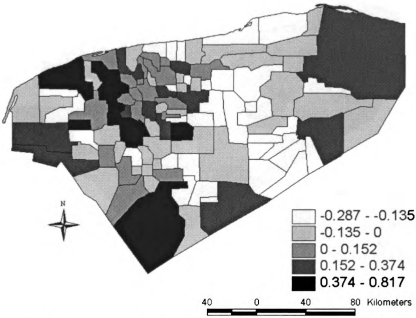

Figure 6.7 Geographic distribution of OLS residuals

6.7.2 Spatial lags model

The spatial lags model was calibrated as shown in Chapter Five. Based on the results of the initial OLS model, the weights matrix based on economic potential was employed. The results of the spatial lags model are displayed below.

$$\begin{array}{llll} \mathbf{(ln)E_T} = 0.3656 & + 0.9066\mathbf{(ln)E_B} & + 0.0667\rho\mathbf{W(ln)E_T} & \\ \quad 0.2804 & 0.0178 & 0.0290 & \\ \quad 0.1922 & 0.0000 & 0.0213 & \\ \mathbf{Pseudo\ R^2} = 0.9602 & \mathbf{LIK}_{(2,103)} = -142.489 & \mathbf{p} = 0.0000 & \end{array}$$

As the results indicate, maximum likelihood estimation was used to calibrate the spatial lags model. As Anselin and Bera (1998) assert, maximum likelihood methods must be employed due to the correlation (simultaneity) between the spatial autoregressive component (W(ln)E_T) and the model residuals. In this instance, traditional OLS is not consistent.

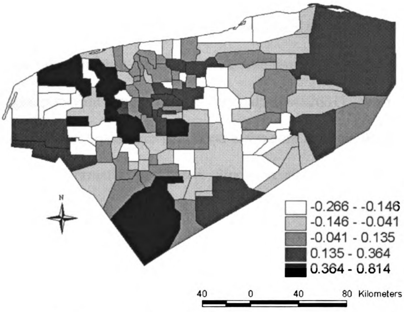

Figure 6.8 Geographic distribution of spatial lags model residuals

In general, the coefficient corresponding to the independent variable (basic employment) does not change significantly in the spatial lags model. In addition, the spatial autoregressive parameter is highly statistically significant and the overall explanatory power of the model improves slightly. It is also important to consider the functional form (log-linear) employed in the model above. Due to this transformation, model coefficients represent elasticities or rates of change (Gujarati, 1995). This transformation is appropriate since our interest is in the economic base multiplier, which represents the impacts of a marginal change in total employment. In other words, the results above indicate that a one percent increase in basic employment generates a 0.91 percent increase in total employment at the *municipio* level.

Figure 6.8 above displays the spatial distribution of the residuals of the spatial lags model. Some small pockets of relatively large positive values persist in and around Mérida. However, diagnostic tests indicate that no significant spatial autocorrelation remains in error terms based on nearest neighbors ($p=0.8159$) or economic potential ($p=0.719$). The map also shows that residuals of the spatial lags model are somewhat smaller than those in the OLS model. Additional tests reveal that heteroskedasticity is no longer prevalent among model residuals ($p=0.2631$). Normality of residuals was not assessed since maximum likelihood estimation requires the assumption that model error terms are normally distributed. Since no significant spatial dependence remains in residuals, no additional spatial econometric models need be calibrated. As a consequence, the spatial lags model may be employed to estimate the spillover effects generated by export-oriented employment at the *municipio* level in Yucatán.

6.7.3 Estimation of local impacts

As discussed in Chapter Five, the traditional economic base multiplier may be expanded to account for the possibility of economic interdependence among *municipios* in Yucatán. The expanded multiplier takes the following form:

$$\mathbf{E}_{T(i)} = (1 - r)^{-1} * [\mathbf{E}_{B(i)} + \rho \mathbf{W}_{ij} \mathbf{E}_{B(j)}] \tag{6.1}$$

The spatial economic-weights matrix (W_{ij}) serves as a measure of the propensity of basic employment in location *i* to generate non-basic employment in place *j*. The spatial autoregressive coefficient (ρ) indicates that basic employment in a given *municipio* has a positive (and statistically significant) impact on total non-basic employment in "spatial-economic neighbors."

The spatial autoregressive component of the model above ($\rho W_{ij} E_{B(j)}$) can be utilized to quantify the job creation effects of basic employment (*maquiladora* production, in this case) in one location on non-basic employment in another location. Drawing on Equation

5.8 above, an increase in basic employment ($(\ln)E_B$) in a given *municipio* will generate a corresponding change (β_1) in total employment ($(\ln)E_T$). The resulting increase will also reverberate through other *municipios* as a consequence of the spatial autoregressive portion of the model ($(\rho W(\ln)E_T)$.

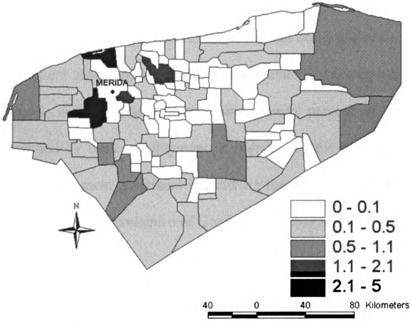

Figure 6.9 Spatial multiplier effects of 1000 basic sector jobs in Mérida

The spatial multiplier model will be employed in five scenarios below. The first two examples represent hypothetical situations; the remaining examples incorporate actual data from Yucatán. In the initial case, the indirect job creation effects of 1000 basic sector jobs in Mérida will be assessed. Subsequently, the impact of 1000 basic sector jobs in a typical rural *municipio* will be presented. The next two examples focus on the employment generation effects of *maquiladora* employment since 1999, as well as the overall spatial impacts of Yucatán's 37,327 export-oriented jobs. The final scenario incorporates direct non-basic employment, as well as indirect non-basic employment, in order to estimate the total job creation effects of the EOI strategy at the local scale. In the context of this dissertation, direct non-basic employment refers to jobs created by basic employment within the *municipio* (E_{Bi}); indirect non-basic employment is generated by basic employment in other locations (E_{Bj}).

The estimated impacts of 1000 additional basic sector jobs in Mérida are shown in Figure 6.9 above. In addition to the 478 direct non-basic sector jobs created locally, about 34 jobs are generated indirectly in rural *municipios* as a consequence of spatial spillovers. Overall, indirect jobs represent about seven percent of total non-basic employment generated by basic employment in Mérida. As the map indicates, spillover effects are modest. The most prominent impacts are found in the nearby port of Progreso (five jobs) and neighboring *municipios* of Uman (three jobs) and Kanasín (two jobs).

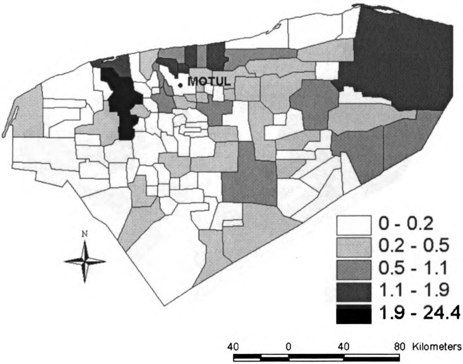

Figure 6.10 Spatial multiplier effects of 1000 basic sector jobs in Motul, Yucatán

The potential spatial implications of the proliferation of export-oriented industrialization in a typical rural area are displayed in Figure 6.10 above. In general, an increase of 1000 basic sector jobs in the *municipio* of Motul results in 179 non-basic positions locally. In addition, about 57 jobs are generated as a consequence of spillover effects. Overall, spillovers represent almost one-quarter of resulting non-basic employment. Compared with the previous example, basic sector employment in rural areas appears to have a greater likelihood of generating non-basic employment in spatial-economic neighbors. This outcome is due to the greater openness of rural economies and confirms some of the insights gleaned from IRIO analysis above. Not surprisingly, about 40 percent of indirect non-basic employment is concentrated in Mérida (24 jobs). However, many other locations, including Progreso (1.3) and the neighboring *municipios* of Sinanché (1.5) and Dzemul (1.5) also benefit as a result of spillover effects.

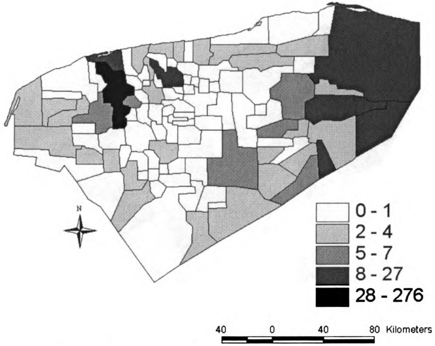

Figure 6.11 Spatial multiplier effects of all *maquila* jobs created since 1999

Figure 6.11 above indicates the spatial distribution of non-basic employment spillovers generated by *maquiladora* employment since 1999. Since the spatial econometric models were calibrated with 1998 data, this graphic reveals the potential impacts of the 4666 export-oriented jobs created since 1999. Overall, more than 529 indirect non-basic jobs result. Although the bulk of spatial spillovers are concentrated in Yucatán's most populated *municipios* (Mérida (276), Tizimín (17), and Progreso (16), for example), smaller locations also experience fairly prominent job creation effects. The average rural *municipio*, for example, experiences an increase of almost 2.5 non-basic sector jobs. A large area in the central part of the state, however, exhibits very few job creation benefits as a result of increases in *maquiladora* production. In general, this area is comprised of small *municipios* that are relatively distant from the largest cities in Yucatán. In addition, as mentioned above, these locations display particularly small economic base multipliers.

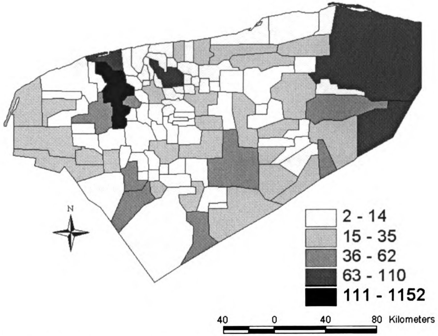

Figure 6.12 Spatial multiplier effects of all *maquila* jobs

It is also possible to estimate the total spillover effects of the 37,327 export-oriented jobs in Yucatán's economy. These impacts are shown in Figure 6.12 above. In general, *maquiladora* production generates more than 3000 indirect non-basic jobs thoughout the state. Although more than 35 percent of all impacts are concentrated in Mérida, all *municipios* experience some benefits. On average, almost 18 jobs have been produced in each rural community as a result of spillover effects. Several rural *municipios*, such as Tizimín (86), Motul (90), and Progreso (110), display especially prominent job creation effects.

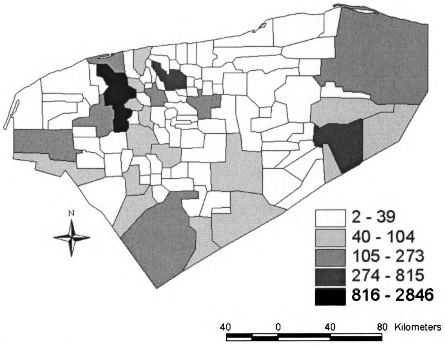

Figure 6.13 Direct and indirect non-basic jobs generated by *maquiladoras*, 1990-2000

Finally, both forms of non-basic employment – direct local employment and indirect spatial spillovers – may be combined in order to estimate the overall impacts of export-oriented industrialization strategy on employment generation at the local scale in Yucatán. As Figure 6.13 above shows, direct and indirect non-basic employment totals almost 7600 jobs. About 37 percent of all jobs are generated in Mérida. However, rural *municipios* on average gain more than 45 direct and indirect non-basic sector jobs. Rural locations displaying particularly prominent job creation effects include Motul (815), Valladolid (537), Maxcanú (273), and Uman (264).

Chapter Seven

A CRITICAL ASSESSMENT OF YUCATAN'S *MAQUILADORA* STRATEGY

7.1 Initial assessment of research hypotheses

Several formal hypotheses and associated research questions were introduced in Chapter One. The methodology developed in Chapter Five and applied in the previous chapter facilitates assessment of the consequences of the EOI strategy and, hence, allows these research questions to be addressed. Each specific hypothesis is evaluated below. Subsequently, a more detailed assessment of the viability of export-oriented industrialization, as well as alternative policy measures, will be offered.

7.1.1 Overall impacts of the EOI strategy

As stated above, economic growth is a necessary condition for regional economic development. Controlling for inflation, Yucatán's gross state product increased by about 23 percent between 1993 and 1999 (about 3.4 percent annually). Between 1990 and 2000, the state's population grew approximately 21.5 percent, or an average of about 1.95 percent per year (INEGI, 2001). Consequently, even when population growth is taken into account, Yucatán's economy demonstrates a fair degree of economic growth.

Furthermore, the analysis carried out in sections 6.4 and 6.5 above confirms that *maquiladora* production has had a notable positive impact on regional economic growth. In addition, the strategy appears to have benefited both urban and rural regions of the state.

The impact of export-oriented production on economic growth may also be assessed by examining Yucatán's overall contribution to national income. According to INEGI (2001) data, Yucatán's gross state product comprised 1.3 percent of total national income in 1993. In 1995, the state accounted for only 1.24 percent of gross national product. By 1999, this share had increased slightly to 1.35. With respect to manufacturing activity, Yucatán's share of GNP rose from 0.83 percent to 0.97 percent during the same period. Though Yucatán still accounts for a relatively small portion of Mexico's economy, its contribution to national income has increased somewhat during the past decade. In addition, *maquiladora* production has played an important role in generating regional income growth. Therefore, these hypotheses cannot be rejected. *Maquiladoras* have had significant impacts on economic growth (in the form of production, income, and employment generation) in Yucatán, Mexico.

7.1.2 Comparison of export-oriented and domestic industries

Tables 6.4 and 6.5 above reveal the impacts of *maquiladora* production on output, income and employment in both urban and rural regions of the state. Complete sectoral multipliers for other industries are included in the appendices. With respect to impacts on output and employment, multipliers for export-oriented firms are smaller than virtually all other sectors of Yucatán's economy. This result is hardly surprising given the dearth of purchases made locally. However, with respect to income generation, *maquiladoras* compare favorably with many other sectors of Yucatán's economy. Therefore, in terms of employment generation and impacts on output, the formal hypothesis stated in Chapter One cannot be rejected. Export-oriented firms have a more limited effect on job creation and output growth than domestic firms. However, with respect to income creation, the hypothesis may be rejected.

An associated hypothesis concerns changes in the magnitude of sectoral multipliers between 1990 and 2000. As a consequence of structural change, the regional economy purportedly should become more self-sufficient and productive. If regional output multipliers for 1988 and 1998 are compared, increases are found in 11 of 18 sectors. Several sectors, such as commerce, restaurants and hotels, personal and professional services, and textile products exhibit substantial increases in terms of their impact on regional output. However, in only eight of 18 instances, aggregate regional purchase coefficients exhibit increases between 1988 and 1998. Consequently, in terms of structural change, Yucatán's experience has been mixed. This associated hypothesis may neither be rejected nor accepted.

7.1.3 Geographic distribution of economic impacts

Since 60 percent of total employment in export-oriented firms is found in rural areas of Yucatán, the majority of direct income and job generation effects are concentrated in this region. In addition, a greater and greater share of *maquiladora* employment has become concentrated in rural *municipios* during the past decade. Consequently, an increasing share of the direct income and employment benefits of the EOI has accrued to rural residents.

With respect to direct impacts on output, *maquiladoras* purchase virtually all needed goods and services in Mérida. Therefore, these impacts are not felt (directly) in rural areas of the state. In the case of rural *maquiladoras*, the vast majority of indirect effects on output flow back to the state capital (Table 6.7). Furthermore, the share of indirect benefits has declined since 1988. Although the majority of income and employment generation benefits remain in rural areas of the state, a greater and greater share of these indirect impacts accrues to residents of Mérida. In the case of urban *maquiladoras*, an increasing share of indirect benefits remains within the region. Consequently, the hypothesis regarding the distribution of indirect economic impacts may not be rejected – the bulk of additional income and output generated by export-oriented firms is concentrated in Mérida. However, the hypothesis concerning changes in the inter-regional distribution of economic effects may be rejected – in general, rural areas of Yucatán have not experienced a greater share of indirect benefits. Consequently, it may be concluded that most of the gains that have accrued to rural areas during the past decade result from an increasing share of direct, rather than indirect, benefits. In general, the greater share of direct gains (in terms of jobs and income) concentrated in rural *municipios* more than compensates for the decreasing retention of indirect benefits.

7.1.4 Economic impacts at the municipio level

The spatial multiplier analysis above confirms that basic economic activity (such as export-oriented production) in a given *municipio* has positive effects on economic activity in surrounding locations. As discussed in Section 6.7, spillovers account for about seven percent of job creation effects in the case of Mérida and around one-quarter of employment impacts in rural *municipios*. In addition, the spatial-economic weights matrix implemented above (accounting for both distance and economic importance) proves statistically significant in accounting for these spillover effects among locations. Therefore, the hypotheses presented in Chapter One may not be rejected – at the *municipio* scale, basic economic activity has positive impacts not only locally, but also within other locations. Furthermore, the geographic extent of these spillover effects is a function of a combination of both distance and economic importance.

7.1.5 Viability of the EOI strategy

The final hypothesis concerns the viability of export-oriented industrialization as a development strategy in the case of Yucatán. This issue will be evaluated at greater length in the remainder of this final chapter. However, both inter-regional input-output analysis and spatial econometric models confirm that *maquiladora* production has had a positive impact on economic growth, income distribution, and economic structure at regional and local scales. On the one hand, export-oriented production has had a positive impact on economic growth in both rural and urban areas of the state. In addition, inception of the *maquiladora* strategy has brought about a modest redistribution of regional income since 1990. Furthermore, on the basis of shifts in sectoral employment, EOI has promoted a degree of structural change in both regions of Yucatán's economy. Therefore, the *maquiladora* strategy fulfills the three formal development criteria introduced in Chapter Two and appears to be a viable economic development strategy in the case of Yucatán, Mexico.

7.2 A more detailed assessment

The ultimate assessment of the viability of export-oriented industrialization, however, must be based on how the strategy contributes to the purported objectives of regional development policy in the case of Yucatán. Specifically, the role of *maquiladora* production in fulfilling the goals of the ***1995-2001 State Development Plan*** must be considered. Some of the concepts related to regional economic development and the role of regional policy introduced in Chapter Two will prove helpful in extending the analysis of the policy implications of the *maquiladora* strategy.

As discussed at length in Chapter Four, Yucatán's ***1995-2001 State Development Plan*** was implemented with the express purpose of achieving "balanced sustainable regional development." Although Friedmann (1966) affirms that the pursuit of balance creates potential conflict from a policy perspective, it is readily apparent that policymakers in Yucatán have sought a more geographically-balanced distribution of economic development as a means of redressing disparities in income, employment and marginality. In fact, the grouping of *municipios* into nine planning districts as shown in Figure 4.5 above provides a clear indication of this objective.

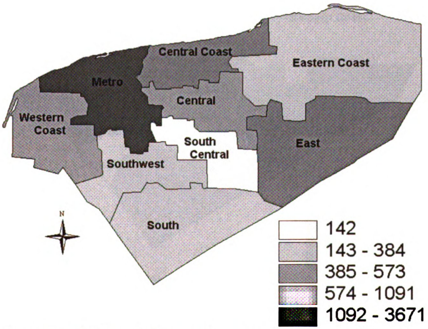

Figure 7.1 Total non-basic employment created by the EOI strategy by planning district

The results of the spatial multiplier analysis may be employed to determine the extent of geographic balance achieved by the EOI strategy. In general, *municipio* level data on direct (local) and indirect (spillover) non-basic employment resulting from *maquiladora* production may be summed for each of the planning regions. These job creation impacts are displayed above in Figure 7.1.

In general, the EOI strategy promotes substantial job creation effects in several planning districts. Not surprisingly, almost 50 percent of all employment generation is concentrated in and around Mérida. However, the Central Coast area gains 1091 jobs and the East region exhibits an increase of 856 positions. Unfortunately, the southern cone planning districts, historically among the most impoverished and economically marginal areas of Yucatán, display the most limited job creation benefits.

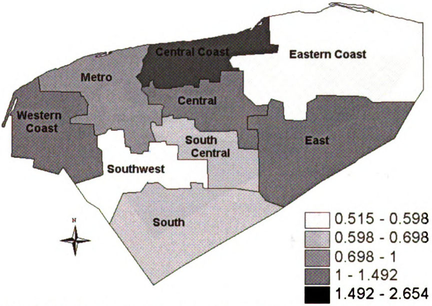

Figure 7.2 Ratio of total non-basic employment to population by planning district

A more complete understanding of job creation effects may be obtained if change in non-basic employment is assessed with reference to population. This population-to-employment ratio technique has been suggested by Blakely (1994) as a means of assessing the distribution of job creation efforts. A ratio greater than one indicates a greater relative share of employment (with respect to population); a ratio less than one reveals a relatively smaller share of employment.[1]

Figure 7.2 above displays the ratio of job creation to population for each planning region. For example, the metropolitan region accounts for 47.7 percent of total non-basic employment generated by the *maquiladora* strategy between 1990 and 2000. However, based on 1995 population figures, this planning district represents 55.6 percent of Yucatán's population. Therefore, the ratio of non-basic employment to population is 0.858.

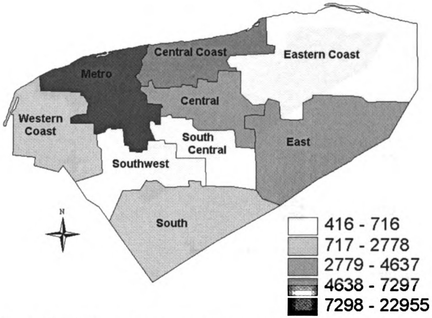

Figure 7.3 Total employment created by *maquiladora* production by planning district

[1] The following discussion makes the implicit assumption that population-to-employment ratios "close" to one indicate greater levels of balance in the distribution of economic impacts. However, this "rule of thumb" was chosen on an *ad hoc* basis; any number of other reasonable criteria may be employed.

Based on this alternative representation, the export-oriented strategy has preformed relatively well in generating economic opportunity in four planning districts – Central Coast, Central, East, and Western Coast. Its impact in the Metropolitan region is also acceptable – although the policy has created substantial employment in the capital region, economic opportunities are not overly concentrated in these *municipios*. However, even when population is taken into account, the policy has not generated sufficient employment in the southern cone and Eastern Coast planning district. In general, the share of non-basic employment in these regions is approximately 30 to 40 percent less than their share of population.

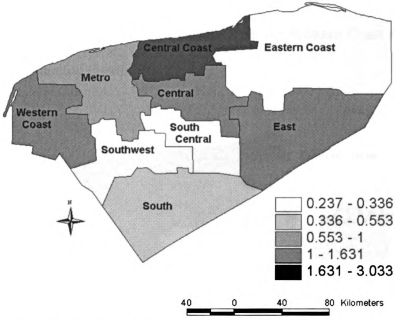

Figure 7.4 Ratio of total employment to population by planning district

Maquiladora employment, as well as resulting non-basic employment, also may be combined as an alternative method of assessing the geographic balance of the EOI strategy. The resulting distribution of economic impacts, shown above in Figure 7.3, is somewhat similar to the distribution of non-basic employment. Not surprisingly, the greatest absolute employment gains are concentrated in the Metropolitan area. Once again, substantial employment generation is found in the Central Coast, Central and East planning districts. In addition, the weakest impacts remain in the Eastern Coast and southernmost regions.

Even when population is accounted for, impacts in the southern part of the state and the Eastern Coast planning district are far inferior to those in other regions of Yucatán (Figure 7.4). In general, the share of total employment generated in these areas by *maquiladoras* is approximately 50 to 75 percent less than their share of population. From another perspective, export-oriented industrialization is directly or indirectly responsible for 25.8 percent of total employment in the Central Coast region, 18.1 percent in the Central planning district, 14.9 percent in the Western Coast area, and 12.8 percent in the East planning district (Figure 7.5).

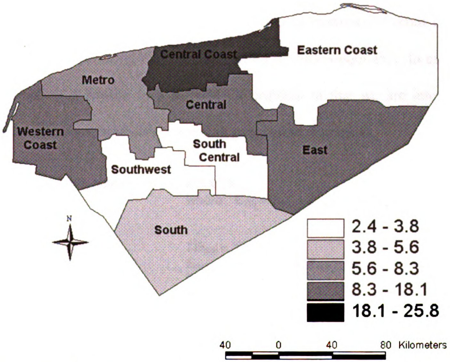

Figure 7.5 Overall employment created by *maquiladoras* as a share of total employment

In the case of remaining (rural) districts, however, EOI accounts for less than six percent of total employment. As displayed in Figure 4.2 above, marginality levels are not especially high in the Eastern Coast region. In general, fishing and cattle ranching are among the most important economic activities in this region. The southernmost planning districts, whose economies are dependent on *milpa* agriculture and some citrus production, exhibit particularly worrisome levels of marginality. The EOI strategy (as currently configured in Yucatán) does not appear to offer any substantial economic benefits to this region of the state.

7.3 Alternative impacts

The spatial multiplier methodology also may be employed to assess the potential consequences of alternative strategies. For example, if geographic balance is the ultimate objective of Yucatán's regional development policy, the spatial multiplier model above may be linked with non-linear optimization to maximize overall employment creation effects while assuring that the distribution of jobs is equitable. In essence, this proposed alternative is similar to a MINIMAX problem in that we are attempting to maximize economic impacts while minimizing geographic disparities.

Objective Function: $\mathbf{MAX}\ \Sigma \mathbf{E}_{T(I)}$

where: $\mathbf{E}_{T(I)} = \mathbf{E}_{B(I)} + \mathbf{E}_{NB(I)} + \rho \mathbf{W}_{IJ}\mathbf{E}_{B(J)}$

Constraints:

$\Sigma \mathbf{E}_{B(I)} = 37{,}327$

$\mathbf{E}_{B(I)}$, $\mathbf{E}_{NB(I)}$, and $\rho \mathbf{W}_{IJ}\mathbf{E}_{B(J)} \geq 0$

$\mathbf{R}_{(I)} / \mathbf{P}_{(I)} \geq 0.9$

$\mathbf{R}_{(I)} / \mathbf{P}_{(I)} \leq 1.1$

where: $\mathbf{R}_{(I)}$ refers to a region's proportion of total employment

$\mathbf{P}_{(I)}$ refers to a region's proportion of total population

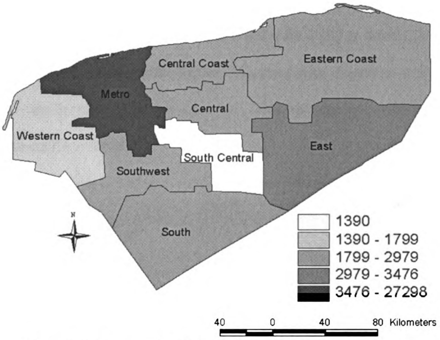

Figure 7.6 Geographically-balanced employment generation scenario

In the geographically-balanced employment generation simulation presented below, the spatial multiplier technique will be utilized to determine the optimal geographic location of Yucatán's 37,327 *maquiladora* jobs (in order to maximize overall job creation impacts), while accounting for population distribution among the nine planning districts. As shown in the constraints above, in each region the ratio of total employment to total population must fall between 0.9 and 1.1.

The results of this simulation are displayed above in Figure 7.6. Overall, the pursuit of geographic balance has increased total basic and non-basic employment (47,950) by about 6.5 percent over actual job creation effects (Figure 7.3).[2] Also, employment generation impacts in the southernmost planning districts are far superior. Furthermore,

[2] Although not shown, non-linear optimization was also utilized to determine the optimal location of *maquiladora* employment in order to maximize overall employment creation without considering geographic balance. In this scenario, total employment creation was 48,177 jobs, less than one percent greater than the outcome of the balanced alternative.

as expected, the distribution of job creation benefits is somewhat smoother (for example, the coefficient of variation has decreased from 0.705 to 0.645). In addition, as displayed in the Lorenz curve below (Figure 7.7), remaining disparities in the distribution of basic and non-basic employment are trivial. This outcome is confirmed by the corresponding Gini coefficient (0.027).

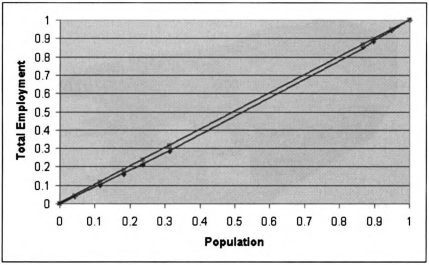

Figure 7.7 Lorenz curve – geographically balanced employment generation

As shown in Figure 7.6, the bulk of job creation impacts remain concentrated in the Metropolitan planning district. This outcome is hardly surprising since the capital region accounts for more than one-half of Yucatán's population. An alternative scenario may be envisioned in which the objective is to maximize overall employment in rural areas while limiting employment impacts in and around Mérida. This hypothetical situation is analogous to two concepts introduced in Chapter Two – Hirschman's (1958) notion of "unbalanced growth" and Friedmann's (1966) goal of choosing the optimal geographic location in which investment is likely to promote "the rapid expansion and full articulation of the space-economy."

In the geographically-imbalanced employment generation scenario presented below, the objective function is to maximize total employment while restricting the ratio of employment to population in the Metropolitan district to 0.75 or less. In the case of rural planning districts, the total employment to population ratio must be at least one. The results of this simulation are displayed below in Figure 7.8.

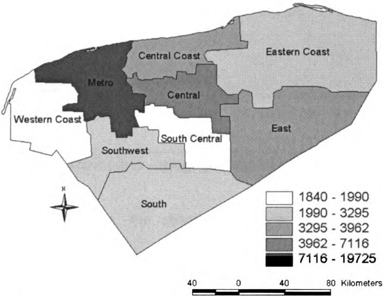

Figure 7.8 Geographically-imbalanced employment generation scenario

At first glance, the results of this strategy do not appear markedly different from the previous scenarios. However, only 40 percent of total job creation impacts are concentrated in the Metropolitan planning district. Consequently, rural planning districts, which comprise about 45 percent of Yucatán's population, share approximately 60 percent of total basic and non-basic employment. The "disequilibrium" of this strategy is evidenced by the Lorenz curve below and the corresponding Gini coefficient (0.147). Overall, in terms of job creation impacts, the geographically-imbalanced strategy

(47,735) compares favorably with the balanced alternative (47,950) and the "non-geographic" optimal location scenario (48,177).

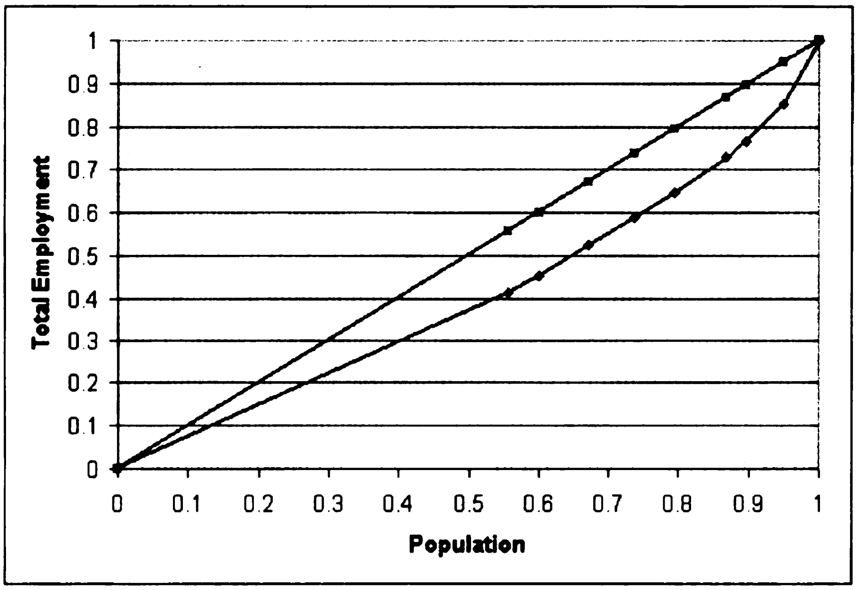

Figure 7.9 Lorenz curve – geographically imbalanced employment generation

In all instances, the above simulations result in substantially greater overall employment generation effects than the current configuration of *maquiladoras* in Yucatán. In general, the existing job creation impacts of export-oriented firms in Yucatán are about five percent smaller than the results of the three scenarios discussed above. Consequently, from a variety of (normative) policy perspectives, it is fair to conclude that the geographic distribution of *maquiladoras* is not optimal. However, as demonstrated in this section, the spatial multiplier model and basic non-linear optimization techniques may be employed in a policy context to maximize the impacts of the EOI strategy while "balancing" any number of other criteria.

7.4 *Maquiladoras* as a "ratchet" for regional development

As discussed in Chapter Two, regional policy plays an essential role in converting economic growth into regional economic development. In general, two functions were ascribed to regional policy – assuring a more equitable distribution of benefits and promoting structural change (Figure 2.1). As mentioned above, structural change is characterized by a shift in the mix of products, industries, firms and job opportunities that make up the regional economy (Malecki, 1991). Furthermore, promotion of stronger forward and backward linkages among firms and households represents a means of bringing about structural change.

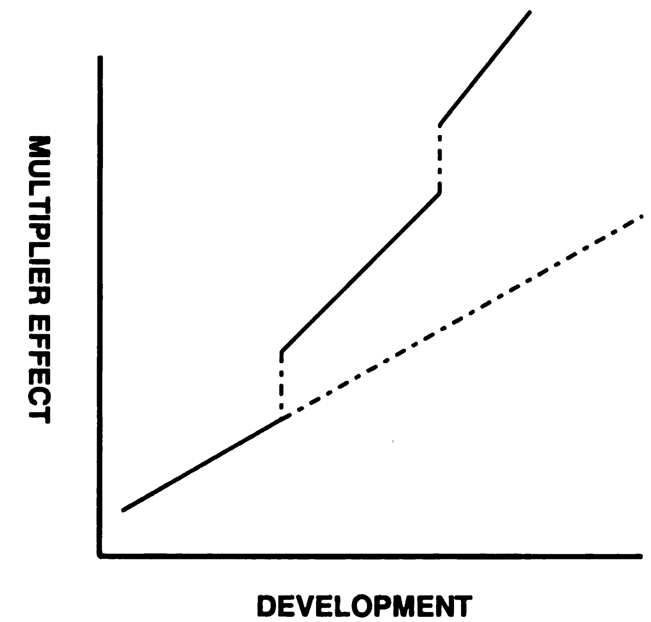

Figure 7.10 Impact of structural change on regional multiplier effect

Based on these definitions, then, structural change is ultimately a function of (changes in) multiplier effects. As Pred (1966) asserts, the regional multiplier is not a constant – it varies not only from place to place, but also from time to time. Krugman (1995) and Fujita et al. (1999) provide a relatively coherent explanation of how changes in multiplier effects and economic structure purportedly induce regional development within an export base context. In general, as regional exports increase, total regional income also increases. At some (unspecified) critical point, the regional economy grows to such an extent that goods that were imported previously may be replaced with local production.

Consequently, the share of income spent locally also increases.[3] As a result of increased local spending, a qualitative change occurs in which multiplier effects increase. Eventually, a cumulative process of regional development takes hold – structural change promotes expansion of the regional multiplier, further increasing income, inducing additional growth of the local market and concomitant structural change, etc.

Expansion of the regional multiplier effect may be envisioned as shown in Figure 7.10 above. The initial solid upward sloping line (starting at the origin) corresponds to economic growth as a consequence of multiplier effects. At some point (indicated by the disjunctures), structural changes are locked in place and the magnitude of the regional multiplier increases.

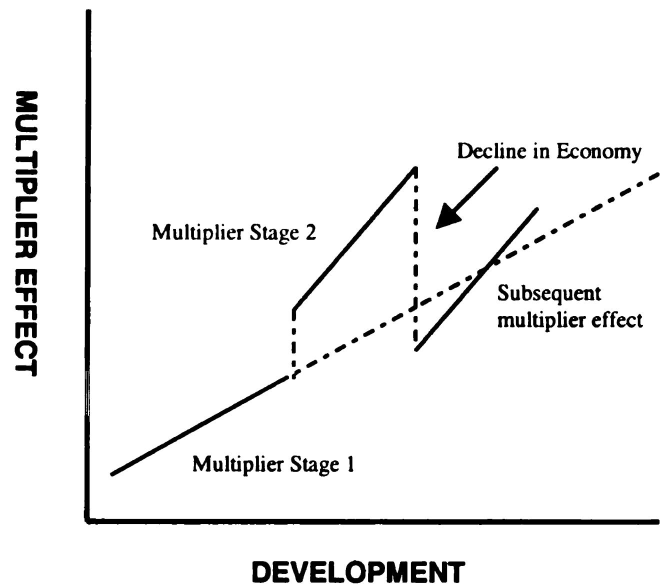

Figure 7.11 "Locking in" of regional economic development

The process described above was termed the "ratchet" effect by Thompson (1965) in referring to the stages of urban economic growth. Essentially, changes in the structure of the regional economy are viewed as cumulative and the ratchet effect serves to lock in

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[3] Based on central place theory, the share of income spent locally is assumed to depend on the size of the local market.

structural change at each stage of development. Even in the event of a decline in economic growth, the "locking in" of structural changes precludes any decline in regional multiplier effects (Figure 7.11).

In the case of Yucatán, policymakers have implemented the *maquiladora* strategy with the express purpose of ratcheting the regional economy to greater levels of development. As discussed in Chapter Four, the proliferation of export-oriented industries in Yucatán is a direct consequence of the ***1995-2001 State Development Plan***, which especially targets rural areas of the state. In the context of the "ratchet" model introduced above, *maquiladoras* are expected to create employment opportunities and provide a steady source of income for an historically underemployed rural population. Although a portion of rural incomes will undoubtedly flow back to Mérida, it is expected that some of these wages will be spent locally (at the *municipio* level). As mentioned above, increases in regional income and local spending purportedly will trigger greater investment in rural *municipios* as entrepreneurs establish businesses to meet the demands of *maquila* workers and their families. Furthermore, the local (non-basic sector) employment generated by *maquiladora* industries will result in a secondary multiplier effect due to additional purchases. Eventually, regional multiplier effects will expand as residents of rural *municipios* are able to meet a greater and greater share of their demand for goods and services locally.

Based on the analysis in Chapter Six, the export-oriented industrialization strategy may produce the ratchet effects desired by policymakers in Yucatán in some (isolated) instances. The *municipio* of Motul provides a good case study of the potential for promoting structural change by means of *maquiladora* production. In 1990, agriculture employed more than 37 percent of the local workforce. Manufacturing made up slightly more than 21 percent of all jobs; service industries and commerce accounted for remaining employment (almost 42 percent). Between 1990 and 2000, more than 5000 jobs were created by export-oriented firms in Motul. According to the 2000 Census of Population, jobs in agriculture had declined to less than 18 percent of total employment. Manufacturing now comprises more than 32 percent of employment and service industries employ almost one-half of the overall workforce.

However, analysis in the preceding chapter also suggests that the prospects for widespread structural change at the *municipio* level in Yucatán are somewhat bleak, at least in the short-term. As documented in Section 6.6, export-oriented industrialization has had a relatively limited impact on structural change, at least in terms of employment, since 1990. Although export-oriented industrialization has brought about a modest redistribution of income between urban and rural regions of Yucatán, results of spatial multiplier analysis (Section 6.7) suggest that the benefits of the EOI strategy have been highly concentrated at the local scale. Among rural *municipios* only a handful of locations (Motul, Tizimín, and Valladolid, for example) display especially prominent increases in local sector employment. These isolated cases of potential structural change, however, suggest the need for additional analysis at the *municipio* level in Yucatán.

7.5 Final remarks

Like other regions of the developing world, Yucatán has adopted the export-oriented industrialization strategy as a means of inducing economic development. As discussed in Chapter Two, previous development strategies – whether traditional resource-based exports or state-led import substitution – have ultimately failed. Unfortunately, the outlook for the *maquiladora* strategy may be equally pessimistic. Topik and Wells (1998), confirm the potential limitations of the current EOI strategy, noting its uncanny (unfortunate) resemblance to the resource-based development strategy of the 19th and early 20th centuries.

Notwithstanding the limitations of *maquiladora* production, policymakers in Yucatán have resorted to the EOI strategy in the pursuit of a "ratchet" for regional economic development. Although the ***1995-2001 State Development Plan*** officially concluded with the gubernatorial elections earlier this year, Yucatán's new (opposing party) governor appears equally committed to export-oriented industrialization. In light of the decision to link Yucatán's economy to *maquiladora* production, several policy prescriptions may be offered in order to augment the potential economic impacts of such a strategy.

Despite relatively robust linkages with "producer" services, *maquiladoras* in Yucatán are not strongly integrated with primary and secondary sectors of the state's economy. Needless to say, increased backward linkages with these industries would generate further benefit for the state's residents and economy by hastening structural change and expansion of the regional multiplier effect.

Furthermore, since Yucatan's economic development strategy emphasizes a single export-oriented industry (clothing and apparel *maquiladoras*), local policymakers should promote expansion of domestic sectors that traditionally supply commodity inputs to these firms. As Mexican border states have demonstrated, backward linkages could also be enhanced by requiring *maquiladoras* to purchase a greater share of local content. Eventually, even if export-oriented firms relocated, manufacturing in Yucatán would become more autonomous and the domestic economy would benefit from the resulting structural change. Preliminary simulations using the integrated model developed above indicate that a two-cent domestic content requirement would increase benefits to Yucatán's economy by ten percent. Furthermore, if export-oriented firms purchased local inputs at the same level as domestic firms, indirect economic impacts would expand by about 70 percent.

In addition, because consumption and production are intertwined, consumers in Yucatán would benefit from greater variety and lower costs if *maquiladoras* were induced to sell a limited amount of their final production locally. As discussed in Chapter Three, this recommendation is quite feasible since full-scale implementation of NAFTA eventually removes the existing disincentives that prompt export-oriented firms to export virtually all of their output.

Ultimately, the success of Yucatán's EOI development strategy is beyond the control of local officials. Yucatán is participating in a global economic process that operates at international, national, regional and local scales simultaneously. This internationalization of manufacturing as a consequence of the new international division of labor includes multinational enterprises, supranational political bodies, international financial institutions, national governments, regions of specific countries, and individual laborers and consumers. Yucatan's only "stable" comparative advantage lies in its relative proximity to markets in the United States and cheap wages relative to other locations in Mexico. The state's ability to expand *maquiladora* production and promote the desired ratchet effect depends on its ability to continue providing low-wage labor and subsidized infrastructure and training.

In a peripheral region such as Yucatán, export-oriented industrialization may be a viable, short-term economic development strategy. Since many sectors of the state's economy depend heavily on imported commodity inputs, *maquiladora* industries do not differ radically from domestic producers in terms of backward linkages. In addition, as income multipliers reveal, *maquiladoras* generate larger direct and indirect impacts than many other sectors of Yucatán's domestic economy. Furthermore, because the economic impacts of export-oriented firms are derived globally, rather than locally, *maquiladoras* may be capable of expanding output (and increasing salaries and employment, as a result) more easily than domestic firms.

However, because global capital is increasingly mobile and the locational decisions of trans-national firms more and more volatile, Yucatán may not be able to emulate the successes of other regions. *Maquiladoras* may relocate long before the state is able to improve wages, effect technology transfers, upgrade the skills of its workers, and integrate export-oriented production more fully into the local economy. In fact, anecdotal evidence exists of several *maquiladora* closings in Yucatán during the past six months as a result of the recent economic slowdown in the United States.

As the analysis above indicates, export-oriented industrialization has had significant positive effects on both urban and rural economies in Yucatán since 1990. However, local policymakers must recognize that the direct benefits of such a strategy are ephemeral. Consequently, state government must strive not only to attract *maquiladora* industries to Yucatán; officials must take advantage of their presence to expand output of domestic firms and promote structural change of local economies, particularly in rural areas of the state.

In conclusion, the export-oriented industrialization strategy offers Yucatán a short-term opportunity to effect a fundamental structural transformation of the state's economy. Regional policy plays a critical role in converting the benefits of *maquiladora* production into structural change. However, this regional economic alchemy – transformation of growth into development – is anything but automatic. Yucatán's current policy initiatives do not specifically contemplate the indirect impacts of the export-oriented production or the role of *maquiladora* industries in bringing about the desired ratchet effect. In addition, *maquiladoras* are not creating the local supply networks needed to promote structural change and resulting convergence. Consequently, the export-oriented development strategy runs the risk of emulating the failures of Yucatán's henequen boom of the late 19th and early 20th centuries.

APPENDICES

APPENDIX A

SURVEY INSTRUMENTS

Survey of Apparel and Clothing-based Maquiladoras in Yucatan, Mexico

When did this plant initiate operations in Yucatan?		1
What were the total costs (construction, equipment, etc.) of initiating operations?		2
What portion of these expenses were incurred in Yucatan?		2a
Did the plant owner (parent company) receive any special considerations or incentives from local and/or state governments?	Y N ?	3
If yes, what incentives were offered?		3a
What was the total value ($) of incentives?		3b
Has the plant made any improvements/investments in local infrastructure?	Y N ?	4
If yes, what kinds of improvements were made?		4a
What was the total value ($) of improvements?		4b
Has the plant made any other contributions to the local community?	Y N ?	5
If yes, what kinds of contributions were made?		5a
What was the total value ($) of contributions?		5b
Is this maquiladora owned by a: Mexican corporation / US corporation / Other / Joint venture		6
Does the plant owner operate other maquiladoras in Yucatan?	Y N ?	7
Does the plant owner operate other non-maquiladoras in Yucatan?	Y N ?	8
If yes, when were other plants established?		8a
If yes, what types of goods do these plants produce?		8b
Does the plant owner operate other maquiladoras in Mexico?	Y N ?	9
If yes, where?		9a
Does the plant owner operate other non-maquiladoras in Mexico?	Y N ?	10
If yes, where?		10a
If yes, when were other plants established?		10b
If yes, what types of goods do these plants produce?		10c
Has the plant owner relocated maquiladora production in the past decade?	Y N ?	11
If yes, from what state to what state?		11a
If yes, why was production relocated?		11b
How many persons did this plant employ in 1998?		12
How many perons were employed when the plant opened?		12a
What was your total payroll (salaries and benefits) in 1998?		12b
Where do the majority of plant employees live?		12c
What percentage of your employees are women?		12d
What was your annual employee turnover rate in 1998?		12e
What type of products does this plant manufacture?		13
What percentage of final production is exported?		13a
Does this plant sell any final production to consumers/companies in Yucatan?	Y N ?	13b
If yes, what percentage of total production is sold in Yucatan?		13c
What are the three primary destinations (cities) of the plant's final production?		14
What percentage of the plant's total raw materials and direct inputs is imported?		15
If less than 100%, does the plant purchase raw materials and inputs in Yucatan?	Y N ?	15a
Annually, what is the value ($) of raw materials and direct inputs bought in Yucatan?		15b
What kinds of goods does the plant purchase in Yucatan?		15c
If yes, what is the name of one of your main suppliers in Yucatan?		15d
If Q8 and/or Q10 yes, does plant purchase inputs from company's non-maquiladoras?	Y N ?	15e
Annually, what is the value of indirect inputs and operating expenses bought in Yucatan?		15f
What was the plant's total gross operating budget for 1998?		16

Figure A.1 Survey of *maquiladoras*

Survey of Domestic Firms
Yucatan, Mexico

What major goods and/or services does this firm produce? 1

During 1999, what types of raw materials and goods and services did this firm purchase? 2
What percentage of these goods/services were imported (supplied by firms outside Yucatán)? 2a
What percentage of these goods and services were supplied by firms in Mérida? 2b

	Goods and Services	Amount ($ or %)	Pct Imported	Pct Mérida
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

What percentage of your expenses was comprised of salaries/benefits? 3
What percentage was comprised of local, state and federal taxes? 4
How many people worked for this firm in 1999? 5
What percentage of these workers lived outside Mérida? 5a
What was your gross operating budget for 1999? 6
Who are the primary customers (industries) for your products? 7
What percentage of your output was exported (sold outside Yucatán)? 7a
What percentage of your output was sold in Mérida? 7b

	Customers	Amount ($ or %)	Pct Exported	Pct Mérida
1				
2				
3				
4				
5				
6				
7				
8				

Did you sell any of your output directly to consumers? Y N ? 8
If yes, how much? 9
Did you sell any of your output to government agencies? Y N ? 10
If yes, how much? 11

Figure A.2 Survey of domestic firms

Survey of Households
Yucatán, Mexico

Where do you live (municipio)? ______ 1

Number of household members ______ 2

Number of household members employed ______ 3

Total monthly household income ______ Less than $5000 (pesos) 4

______ Between $5000 and $15000

______ More than $15000

Percentage of HH income spent on following 5

EXPENSE	Percent	% Spent in Mérida
Food		
Housing		
Clothing		
Transportation		
Utilities		
Education & medical expenses		
Eating out		
Other entertainment		
Help around house		
Other services		
Taxes		
Savings		

Figure A.3 Survey of households

APPENDIX B

CINVESTAV REGIONAL INPUT-OUTPUT TABLE

	SECTOR	1	2	3	4	5	6	7	8	9
1	AGRICULTURA	0.1069	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	GANADERIA	0.0000	0.0537	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	SILVICULTURA	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4	CAZA Y PESCA	0.0000	0.0000	0.0000	0.0190	0.0000	0.0000	0.0000	0.0000	0.0000
5	CARBON Y DERIVADOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	EXTRACCION DE PETROLEO Y GAS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7	MINERAL DE HIERRO	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	MINERALES METALICOS NO FERROSOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
9	CANTERAS,ARENA, GRAVA Y ARCILLA	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
10	OTROS MINERALES NO METALICOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	PRODUCTOS CARNICOS Y LACTEOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
12	ENVASADO DE FRUTAS Y LEGUMBRES	0.0000	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
13	MOLIENDA DE TRIGO Y SUS PRODUCTOS	0.0000	0.0050	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
14	MOLIENDA DE NIXTAMAL Y PRODUCTOS DE MAIZ	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15	PROCESAMIENTO DE CAFÉ	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
16	AZUCAR Y SUBPRODUCTOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
17	ACEITES Y GRASAS VEGETALES COMESTIBLES	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
18	ALIMENTOS PARA ANIMALES	0.0000	0.3195	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
19	OTROS PRODUCTOS ALIMENTICIOS	0.0000	0.0000	0.0000	0.0161	0.0000	0.0000	0.0000	0.0000	0.0000
20	BEBIDAS ALCOHOLICAS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
21	CERVEZA	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22	REFRESCOS EMBOTELLADOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
23	TABACO Y SUS PRODUCTOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24	HILADO Y TEJIDO DE FIBRAS BLANDAS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25	HILADO Y TEJIDO DE FIBRAS DURAS	0.0000	0.0000	0.0000	0.0025	0.0000	0.0000	0.0000	0.0000	0.0001
26	OTRAS INDUSTRIAS TEXTILES	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000
27	PRENDAS DE VESTIR	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
28	CUERO Y SUS PRODUCTOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
29	ASERRADEROS INCLUSO TRIPLAY	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
30	OTRAS INDUSTRIAS DE LA MADERA	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
31	PAPEL Y CARTON	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
32	IMPRENTAS Y EDITORIALES	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
33	REFINACION DE PETROLEO	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
34	PETROQUIMICA BASICA	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
35	QUIMICA BASICA	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
36	ABONOS Y FERTILIZANTES	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
37	RESINAS SINTETICAS Y FIBRAS ARTIFICIALES	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
38	PRODUCTOS MEDICINALES	0.0000	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
39	JABONES,DETERGENTES, PERFUMES Y COSMETICOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
40	OTRAS INDUSTRIAS QUIMICAS	0.0044	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
41	PRODUCTOS DE HULE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
42	ARTICULOS DE PLASTICO	0.0002	0.0019	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
43	VIDRIO Y SUS PRODUCTOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
44	CEMENTO	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
45	OTROS PRODUCTOS DE MINERALES NO METALICOS	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
46	INDUSTRIAS BASICAS DEL HIERRO Y ACERO	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
47	INDUSTRIAS BASICAS DE METALES NO FERROSOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
48	MUEBLES Y ACCESORIOS METALICOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
49	PRODUCTOS METALICOS ESTRUCTURALES	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
50	OTROS PRODUCTOS METALICOS	0.0002	0.0000	0.0000	0.0314	0.0000	0.0000	0.0000	0.0000	0.0024
51	MAQUINARIA Y EQUIPO NO ELECTRICO	0.0144	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0054
52	MAQUINARIA Y APARATOS ELECTRICOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
53	APARATOS ELECTRO-DOMESTICOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
54	EQUIPOS Y ACCESORIOS ELECTRONICOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
55	OTROS EQUIPOS Y APARATOS ELECTRICOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
56	VEHICULOS AUTOMOVILES	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
57	CARROCERIAS Y PARTES AUTOMOTRICES	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
58	OTROS EQUIPOS Y MATERIAL DE TRANSPORTE	0.0000	0.0000	0.0000	0.0588	0.0000	0.0000	0.0000	0.0000	0.0000
59	OTRAS INDUSTRIAS MANUFACTURERAS	0.0000	0.0000	0.0000	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000
60	CONSTRUCCION E INSTALACIONES	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
61	ELECTRICIDAD, GAS Y AGUA	0.0087	0.0040	0.0000	0.0035	0.0000	0.0000	0.0000	0.0000	0.0389
62	COMERCIO	0.0478	0.0120	0.0000	0.0493	0.0000	0.0000	0.0000	0.0000	0.0115
63	RESTAURANTES Y HOTELES	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0196
64	TRANSPORTE	0.0179	0.0021	0.0000	0.0021	0.0000	0.0000	0.0000	0.0000	0.0030
65	COMUNICACIONES	0.0000	0.0007	0.0000	0.0017	0.0000	0.0000	0.0000	0.0000	0.0023
66	SERVICIOS FINANCIEROS	0.0012	0.0015	0.0000	0.0180	0.0000	0.0000	0.0000	0.0000	0.0150
67	ALQUILER DE INMUEBLES	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0074
68	SERVICIOS PROFESIONALES	0.0000	0.0042	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0087
69	SERVICIOS DE EDUCACION	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
70	SERVICIOS MEDICOS	0.0000	0.0022	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
71	SERVICIOS DE ESPARCIMIENTO	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
72	OTROS SERVICIOS	0.0000	0.0117	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0215

Table B.1 Technical coefficients, CINVESTAV regional input-output table

10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
0.0000	0.0000	0.1600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0273	0.0200	0.0001	0.0000	0.0005	0.0000	0.0000	0.1675
0.0000	0.6819	0.0078	0.0185	0.0000	0.0000	0.0000	0.0000	0.0000	0.0237	0.0003	0.0000	0.0000	0.0000	0.0001	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5140	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.1276	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0035	0.0051	0.0009	0.0000	0.0000	0.0000	0.0000	0.0046	0.0253	0.0001	0.0000	0.0002	0.0000	0.0000	0.0003
0.0000	0.0000	0.0268	0.0032	0.0000	0.0000	0.0000	0.0000	0.0008	0.0063	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0005	0.1291	0.0000	0.0000	0.0000	0.0000	0.0137	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.2934	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0005	0.0080	0.0440	0.0000	0.0000	0.0000	0.0002	0.0339	0.0023	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0001	0.0019	0.0039	0.0003	0.0026	0.0000	0.0000	0.0022	0.0030	0.0040	0.0017	0.0365	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0191	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0001	0.0000	0.0000	0.0005	0.0000	0.0006	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001	0.1350
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.0000	0.0001
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0016	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0017	0.0038	0.0003	0.0018	0.0000	0.0002	0.0000	0.0005	0.0063	0.0000	0.0017	0.0000	0.0002	0.0008
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0470	0.0003	0.0003	0.0000	0.0000	0.0006
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0003	0.0003	0.0184	0.0151	0.0030	0.0000	0.0000	0.0016	0.0008	0.0046	0.0000	0.0000	0.0171	0.0000	0.0000	0.0000
0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0002	0.0001	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0004	0.0000	0.0686	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0075	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0054	0.0001	0.0036	0.0005	0.0002	0.0001	0.0000	0.0002	0.0000	0.0002	0.0004	0.0016	0.0023	0.0000	0.0002	0.0009
0.0097	0.0001	0.0004	0.0009	0.0004	0.0003	0.0000	0.0002	0.0000	0.0005	0.0008	0.0024	0.0012	0.0000	0.0005	0.0016
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0007	0.0020	0.0121	0.0151	0.0179	0.0056	0.0000	0.0109	0.0088	0.0165	0.0094	0.0412	0.0088	0.0000	0.1994	0.0332
0.0248	0.2402	0.0762	0.0488	0.0380	0.1174	0.0000	0.1533	0.1657	0.1388	0.0858	0.0459	0.0498	0.0000	0.0542	0.0661
0.0014	0.0000	0.0010	0.0002	0.0000	0.0001	0.0000	0.0001	0.0015	0.0000	0.0001	0.0107	0.0019	0.0000	0.0002	0.0046
0.0227	0.0111	0.0175	0.0040	0.0017	0.0053	0.0000	0.0065	0.0090	0.0079	0.0061	0.0237	0.0096	0.0000	0.0028	0.0098
0.0186	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0004	0.0000	0.0000	0.0030	0.0005	0.0000	0.0000	0.0006
0.0692	0.0000	0.0008	0.0001	0.0000	0.0001	0.0000	0.0001	0.0022	0.0000	0.0001	0.0154	0.0027	0.0000	0.0001	0.0035
0.0000	0.0000	0.0014	0.0003	0.0000	0.0001	0.0000	0.0000	0.0003	0.0005	0.0003	0.0005	0.0012	0.0000	0.0000	0.0011
0.0017	0.0000	0.0004	0.0003	0.0000	0.0001	0.0000	0.0000	0.0024	0.0007	0.0011	0.0288	0.0146	0.0000	0.0001	0.0021
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0079	0.0002	0.0000	0.0000	0.0000	0.0000	0.0001	0.0006	0.0009	0.0022	0.0010	0.0000	0.0000	0.0001
0.0187	0.0000	0.0021	0.0004	0.0000	0.0001	0.0000	0.0001	0.0006	0.0003	0.0002	0.0027	0.0017	0.0000	0.0002	0.0047

26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0001	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0471	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0528	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0034	0.0103	0.0026	0.0000
0.0000	0.0000	0.0015	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0004	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005	0.0000	0.0000	0.0010	0.0036	0.0021	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0023	0.0000	0.0002	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0495	0.0008	0.0007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0002	0.0059	0.0003	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005
0.0000	0.0125	0.0000	0.0001	0.0000	0.0000	0.0001	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0002	0.0064	0.0270	0.0007	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0000
0.0001	0.0000	0.0002	0.0000	0.0042	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0002	0.0005	0.0000	0.0003	0.0000	0.0000	0.0001	0.0000	0.0023	0.0000	0.0000	0.0047	0.0000	0.0017	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0004	0.0001	0.0001	0.0002	0.0000	0.0001	0.0000	0.0008	0.0000	0.0000	0.0002	0.0009	0.0004	0.0002
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0028	0.0001	0.0208	0.0001	0.0423	0.0006	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0004	0.0044	0.0073	0.0000	0.0035	0.0005	0.0010	0.0006	0.0000	0.0222	0.0000	0.0000	0.0571	0.0002	0.0169	0.0000
0.0000	0.0000	0.0000	0.0000	0.0015	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0095	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0207	0.0000	0.0009	0.0000	0.0000	0.0001	0.0000	0.0068	0.0000
0.0000	0.0000	0.0000	0.0000	0.0010	0.0000	0.0002	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0001	0.0001	0.0003	0.0002	0.0043	0.0001	0.0003	0.0001	0.0000	0.0001	0.0000	0.0000	0.0002	0.0007	0.0009	0.0007
0.0003	0.0000	0.0003	0.0003	0.0007	0.0000	0.0006	0.0002	0.0000	0.0002	0.0000	0.0000	0.0001	0.0014	0.0015	0.0011
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0001	0.0006	0.0000	0.0000	0.0000	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0278	0.0149	0.0097	0.0123	0.0138	0.0132	0.0145	0.0268	0.0000	0.0484	0.0000	0.0000	0.0124	0.0131	0.0082	0.0285
0.0798	0.0573	0.0825	0.1149	0.1124	0.0295	0.0690	0.0421	0.0000	0.1030	0.0000	0.0000	0.0485	0.0645	0.0861	0.0870
0.0001	0.0030	0.0000	0.0032	0.0023	0.0006	0.0108	0.0022	0.0000	0.0009	0.0000	0.0000	0.0005	0.0001	0.0001	0.0066
0.0041	0.0109	0.0149	0.0145	0.0138	0.0027	0.0124	0.0094	0.0000	0.0133	0.0000	0.0000	0.0183	0.0065	0.0094	0.0169
0.0000	0.0004	0.0000	0.0004	0.0003	0.0001	0.0013	0.0010	0.0000	0.0001	0.0000	0.0000	0.0012	0.0000	0.0000	0.0008
0.0001	0.0023	0.0000	0.0024	0.0017	0.0005	0.0082	0.0043	0.0000	0.0007	0.0000	0.0000	0.0004	0.0001	0.0001	0.0050
0.0002	0.0021	0.0020	0.0007	0.0028	0.0002	0.0063	0.0003	0.0000	0.0004	0.0000	0.0000	0.0026	0.0003	0.0005	0.0017
0.0001	0.0017	0.0007	0.0014	0.0013	0.0003	0.0053	0.0052	0.0000	0.0004	0.0000	0.0000	0.0008	0.0008	0.0003	0.0033
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0028	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0004	0.0006	0.0000	0.0003	0.0000	0.0006	0.0000	0.0000	0.0001	0.0000	0.0000	0.0005	0.0007	0.0002	0.0004
0.0001	0.0019	0.0008	0.0026	0.0017	0.0008	0.0067	0.0042	0.0000	0.0017	0.0000	0.0000	0.0017	0.0004	0.0005	0.0052

42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0044	0.0937	0.0000	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0050	0.0000	0.0001	0.0002	0.0007	0.0000	0.0000	0.0001	0.0000	0.0000
0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0011	0.0007	0.0005	0.0012	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0002	0.0000	0.0000	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0164	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0002	0.0014	0.0000	0.0003	0.0000	0.0000	0.0000	0.0057	0.0001	0.0012	0.0001	0.0000	0.0000	0.0004	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0032	0.0226	0.0000	0.0002	0.0000	0.0000	0.0525	0.0205	0.0005	0.0033	0.0017	0.0000	0.0000	0.0572	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0062	0.0004	0.0000	0.0043	0.0000	0.0000	0.0056	0.0004	0.0010	0.0012	0.0057	0.0000	0.0000	0.0067	0.0000	0.0000
0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0040	0.1132	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0006	0.0001	0.0000	0.0677	0.0001	0.0000	0.0036	0.0000	0.0009	0.0012	0.0030	0.0000	0.0000	0.0063	0.0000	0.0000
0.0001	0.0000	0.0003	0.0090	0.2303	0.0000	0.0196	0.0217	0.0055	0.0178	0.0174	0.0000	0.0000	0.0075	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0007	0.0000	0.0000	0.0000	0.0215	0.0000	0.0033	0.0031	0.0000	0.0000	0.0000	0.0000	0.0000
0.0005	0.0004	0.0022	0.0017	0.0005	0.0000	0.0089	0.0048	0.0005	0.0020	0.0051	0.0000	0.0000	0.0006	0.0000	0.0000
0.0009	0.0009	0.0035	0.0016	0.0002	0.0000	0.0014	0.0008	0.0010	0.0074	0.0027	0.0000	0.0000	0.0004	0.0000	0.0000
0.0002	0.0000	0.0000	0.0004	0.0001	0.0000	0.0000	0.0002	0.0004	0.0001	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0351	0.0277	0.1070	0.0177	0.0301	0.0000	0.0157	0.0114	0.0145	0.0119	0.0139	0.0000	0.0000	0.0203	0.0000	0.0000
0.1090	0.0653	0.0301	0.0769	0.1854	0.0000	0.1336	0.1149	0.0641	0.1000	0.0411	0.0000	0.0000	0.0468	0.0000	0.0000
0.0057	0.0024	0.0131	0.0016	0.0001	0.0000	0.0036	0.0025	0.0040	0.0048	0.0082	0.0000	0.0000	0.0017	0.0000	0.0000
0.0191	0.0059	0.0098	0.0112	0.0093	0.0000	0.0168	0.0124	0.0102	0.0207	0.0019	0.0000	0.0000	0.0208	0.0000	0.0000
0.0007	0.0003	0.0036	0.0002	0.0000	0.0000	0.0004	0.0003	0.0005	0.0006	0.0010	0.0000	0.0000	0.0002	0.0000	0.0000
0.0044	0.0018	0.0187	0.0012	0.0002	0.0000	0.0027	0.0019	0.0030	0.0036	0.0062	0.0000	0.0000	0.0013	0.0000	0.0000
0.0034	0.0005	0.0009	0.0013	0.0002	0.0000	0.0039	0.0017	0.0020	0.0038	0.0032	0.0000	0.0000	0.0040	0.0000	0.0000
0.0034	0.0011	0.0163	0.0009	0.0001	0.0000	0.0020	0.0011	0.0023	0.0026	0.0038	0.0000	0.0000	0.0026	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0008	0.0000	0.0010	0.0002	0.0000	0.0000	0.0004	0.0000	0.0005	0.0005	0.0002	0.0000	0.0000	0.0016	0.0000	0.0000
0.0043	0.0037	0.0139	0.0029	0.0009	0.0000	0.0031	0.0019	0.0041	0.0055	0.0051	0.0000	0.0000	0.0037	0.0000	0.0000

58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005	0.0006	0.0002	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0502	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0004	0.0062	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0010	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0018	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0004	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0002	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0014	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0003	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0001	0.0002	0.0000	0.0000	0.0000	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0001	0.0006	0.0000	0.0001
0.0000	0.0000	0.0000	0.0002	0.0002	0.0001	0.0001	0.0002	0.0000	0.0000	0.0000	0.0003	0.0003	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0002	0.0051	0.0006	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0001	0.0000	0.0000	0.0001
0.0001	0.0007	0.0031	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0002	0.0001	0.0000
0.0000	0.0008	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0055	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0040	0.0004	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0002	0.0000	0.0008
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0059	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0003	0.0017	0.0152	0.0000	0.0050	0.0000	0.0000	0.0002	0.0000	0.0001	0.0000	0.0004	0.0000	0.0000	0.0001
0.0016	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0300	0.0001	0.0000	0.0000	0.0000	0.0007	0.0000	0.0001	0.0000	0.0015	0.0008	0.0000	0.0001
0.0000	0.0011	0.1870	0.0003	0.0000	0.0000	0.0000	0.0008	0.0000	0.0068	0.0000	0.0008	0.0014	0.0000	0.0057
0.0205	0.0014	0.1106	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0001	0.0611	0.0002	0.0000	0.0000	0.0001	0.0006	0.0000	0.0004	0.0000	0.0002	0.0000	0.0000	0.0007
0.0013	0.0006	0.0116	0.0013	0.0003	0.0001	0.0007	0.0004	0.0000	0.0003	0.0000	0.0002	0.0001	0.0001	0.0003
0.0018	0.0010	0.0007	0.0027	0.0002	0.0001	0.0015	0.0004	0.0000	0.0000	0.0000	0.0002	0.0001	0.0001	0.0003
0.0001	0.0000	0.0002	0.0007	0.0000	0.0000	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0006	0.0000	0.0001	0.0000	0.0001	0.0000	0.0002	0.0000	0.0003	0.0000	0.0011	0.0001	0.0001	0.0002
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0056	0.0238	0.0000	0.0197	0.0092	0.0057	0.0046	0.0076	0.0000	0.0171	0.0006	0.0487	0.1440	0.0752	0.0070
0.0695	0.0689	0.1340	0.0089	0.0043	0.0033	0.0100	0.0044	0.0000	0.0021	0.0013	0.0063	0.0045	0.0027	0.0045
0.0016	0.0019	0.0000	0.0016	0.0174	0.0060	0.0082	0.0146	0.0001	0.0063	0.0107	0.0080	0.0030	0.0062	0.0003
0.0113	0.0178	0.0028	0.0051	0.0317	0.0025	0.0142	0.0159	0.0001	0.0021	0.0103	0.0107	0.0034	0.0020	0.0079
0.0010	0.0002	0.0000	0.0016	0.0132	0.0088	0.0042	0.0266	0.0001	0.0013	0.0123	0.0129	0.0062	0.0086	0.0012
0.0024	0.0015	0.0000	0.0080	0.0469	0.0193	0.0108	0.0102	0.0001	0.0030	0.0118	0.0178	0.0063	0.0168	0.0019
0.0004	0.0035	0.0000	0.0001	0.0112	0.0120	0.0013	0.0130	0.0001	0.0000	0.0037	0.0072	0.0029	0.0132	0.0119
0.0030	0.0017	0.0000	0.0033	0.0770	0.0319	0.0293	0.0314	0.0003	0.0012	0.0383	0.0192	0.0097	0.0471	0.0023
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0013	0.0000	0.0000
0.0448	0.0000	0.0000	0.0011	0.0008	0.0000	0.0224	0.0000	0.0000	0.0000	0.0000	0.0259	0.0121	0.0030	0.0000
0.0001	0.0007	0.0000	0.0000	0.0050	0.0196	0.0005	0.0001	0.0000	0.0012	0.0151	0.0047	0.0018	0.0962	0.0003
0.0020	0.0020	0.0000	0.0054	0.0111	0.0107	0.0106	0.0256	0.0000	0.1316	0.0084	0.0178	0.0088	0.0167	0.0086

	SECTOR	1	2	3	4	5	6	7	8	9
1	AGRICULTURA	1.1198	0.0106	0.0000	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000
2	GANADERIA	0.0000	1.0582	0.0000	0.0007	0.0000	0.0000	0.0000	0.0000	0.0000
3	SILVICULTURA	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4	CAZA Y PESCA	0.0000	0.0004	0.0000	1.0281	0.0000	0.0000	0.0000	0.0000	0.0000
5	CARBON Y DERIVADOS	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000
6	EXTRACCION DE PETROLEO Y GAS	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000
7	MINERAL DE HIERRO	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000
8	MINERALES METALICOS NO FERROSOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000
9	CANTERAS,ARENA, GRAVA Y ARCILLA	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000
10	OTROS MINERALES NO METALICOS	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	PRODUCTOS CARNICOS Y LACTEOS	0.0000	0.0016	0.0000	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000
12	ENVASADO DE FRUTAS Y LEGUMBRES	0.0000	0.0013	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
13	MOLIENDA DE TRIGO Y SUS PRODUCTOS	0.0000	0.0114	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
14	MOLIENDA DE NIXTAMAL Y PRODUCTOS DE MAIZ	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15	PROCESAMIENTO DE CAFÉ	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
16	AZUCAR Y SUBPRODUCTOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
17	ACEITES Y GRASAS VEGETALES COMESTIBLES	0.0000	0.0120	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
18	ALIMENTOS PARA ANIMALES	0.0000	0.3382	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
19	OTROS PRODUCTOS ALIMENTICIOS	0.0000	0.0008	0.0000	0.0166	0.0000	0.0000	0.0000	0.0000	0.0000
20	BEBIDAS ALCOHOLICAS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
21	CERVEZA	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22	REFRESCOS EMBOTELLADOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
23	TABACO Y SUS PRODUCTOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24	HILADO Y TEJIDO DE FIBRAS BLANDAS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25	HILADO Y TEJIDO DE FIBRAS DURAS	0.0000	0.0001	0.0000	0.0030	0.0000	0.0000	0.0000	0.0000	0.0001
26	OTRAS INDUSTRIAS TEXTILES	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000
27	PRENDAS DE VESTIR	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
28	CUERO Y SUS PRODUCTOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
29	ASERRADEROS INCLUSO TRIPLAY	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
30	OTRAS INDUSTRIAS DE LA MADERA	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
31	PAPEL Y CARTON	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
32	IMPRENTAS Y EDITORIALES	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
33	REFINACION DE PETROLEO	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
34	PETROQUIMICA BASICA	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
35	QUIMICA BASICA	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000
36	ABONOS Y FERTILIZANTES	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
37	RESINAS SINTETICAS Y FIBRAS ARTIFICIALES	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
38	PRODUCTOS MEDICINALES	0.0000	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
39	JABONES,DETERGENTES, PERFUMES Y COSMETICOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
40	OTRAS INDUSTRIAS QUIMICAS	0.0050	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000
41	PRODUCTOS DE HULE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
42	ARTICULOS DE PLASTICO	0.0006	0.0029	0.0000	0.0005	0.0000	0.0000	0.0000	0.0000	0.0001
43	VIDRIO Y SUS PRODUCTOS	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
44	CEMENTO	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
45	OTROS PRODUCTOS DE MINERALES NO METALICOS	0.0001	0.0002	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0002
46	INDUSTRIAS BASICAS DEL HIERRO Y ACERO	0.0004	0.0000	0.0000	0.0019	0.0000	0.0000	0.0000	0.0000	0.0002
47	INDUSTRIAS BASICAS DE METALES NO FERROSOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
48	MUEBLES Y ACCESORIOS METALICOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
49	PRODUCTOS METALICOS ESTRUCTURALES	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
50	OTROS PRODUCTOS METALICOS	0.0003	0.0001	0.0000	0.0324	0.0000	0.0000	0.0000	0.0000	0.0025
51	MAQUINARIA Y EQUIPO NO ELECTRICO	0.0163	0.0002	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0056
52	MAQUINARIA Y APARATOS ELECTRICOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
53	APARATOS ELECTRO-DOMESTICOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
54	EQUIPOS Y ACCESORIOS ELECTRONICOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
55	OTROS EQUIPOS Y APARATOS ELECTRICOS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
56	VEHICULOS AUTOMOVILES	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
57	CARROCERIAS Y PARTES AUTOMOTRICES	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
58	OTROS EQUIPOS Y MATERIAL DE TRANSPORTE	0.0000	0.0000	0.0000	0.0605	0.0000	0.0000	0.0000	0.0000	0.0000
59	OTRAS INDUSTRIAS MANUFACTURERAS	0.0000	0.0001	0.0000	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000
60	CONSTRUCCION E INSTALACIONES	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
61	ELECTRICIDAD, GAS Y AGUA	0.0110	0.0093	0.0000	0.0062	0.0000	0.0000	0.0000	0.0000	0.0407
62	COMERCIO	0.0565	0.0735	0.0000	0.0608	0.0000	0.0000	0.0000	0.0000	0.0131
63	RESTAURANTES Y HOTELES	0.0014	0.0021	0.0000	0.0015	0.0000	0.0000	0.0000	0.0000	0.0204
64	TRANSPORTE	0.0228	0.0085	0.0000	0.0056	0.0000	0.0000	0.0000	0.0000	0.0043
65	COMUNICACIONES	0.0010	0.0022	0.0000	0.0028	0.0000	0.0000	0.0000	0.0000	0.0031
66	SERVICIOS FINANCIEROS	0.0045	0.0063	0.0000	0.0219	0.0000	0.0000	0.0000	0.0000	0.0168
67	ALQUILER DE INMUEBLES	0.0008	0.0012	0.0000	0.0009	0.0000	0.0000	0.0000	0.0000	0.0083
68	SERVICIOS PROFESIONALES	0.0054	0.0119	0.0000	0.0056	0.0000	0.0000	0.0000	0.0000	0.0113
69	SERVICIOS DE EDUCACION	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
70	SERVICIOS MEDICOS	0.0006	0.0026	0.0000	0.0030	0.0000	0.0000	0.0000	0.0000	0.0002
71	SERVICIOS DE ESPARCIMIENTO	0.0005	0.0007	0.0000	0.0005	0.0000	0.0000	0.0000	0.0000	0.0008
72	OTROS SERVICIOS	0.0013	0.0141	0.0000	0.0014	0.0000	0.0000	0.0000	0.0000	0.0237

Table B.2 Sectoral multipliers, CINVESTAV regional input-output table

10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
0.0000	0.0073	0.1891	0.0012	0.0000	0.0001	0.0000	0.0000	0.0310	0.0247	0.0002	0.0001	0.0015	0.0000	0.0000	0.2190
0.0000	0.7252	0.0128	0.0237	0.0000	0.0001	0.0000	0.0000	0.0038	0.0441	0.0005	0.0001	0.0018	0.0000	0.0000	0.0002
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0003	0.0011	0.0024	0.0002	0.0013	0.0000	0.0000	0.0012	0.5322	0.0022	0.0009	0.0196	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0001	0.0000	0.0099	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1.0000	0.0001	0.1346	0.0005	0.0000	0.0000	0.0000	0.0000	0.0001	0.0012	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	1.0047	0.0055	0.0013	0.0000	0.0001	0.0000	0.0000	0.0047	0.0259	0.0002	0.0001	0.0011	0.0000	0.0000	0.0003
0.0000	0.0009	1.0283	0.0039	0.0000	0.0000	0.0000	0.0000	0.0009	0.0067	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000
0.0000	0.0078	0.0008	1.1494	0.0000	0.0000	0.0000	0.0000	0.0158	0.0008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	1.4157	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0088	0.0087	0.0511	0.0000	0.0000	0.0000	1.0002	0.0348	0.0029	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000
0.0000	0.2318	0.0041	0.0076	0.0000	0.0000	0.0000	0.0000	1.0016	0.0141	0.0002	0.0000	0.0006	0.0000	0.0000	0.0001
0.0000	0.0006	0.0021	0.0046	0.0004	0.0024	0.0000	0.0000	0.0023	1.0116	0.0041	0.0018	0.0373	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0197	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000
0.0001	0.0001	0.0000	0.0007	0.0000	0.0000	0.0000	0.0000	0.0001	0.0018	0.0000	0.0000	0.0001	0.0000	0.0000	1.1576
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0000	0.0003	0.0001	0.0000	0.0001	0.0001
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0001	0.0000	0.0018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000
0.0002	0.0001	0.0020	0.0045	0.0005	0.0024	0.0000	0.0002	0.0001	0.0005	0.0066	0.0001	0.0018	0.0000	0.0000	0.0010
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0002	0.0484	0.0003	0.0003	0.0000	0.0000	0.0008
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0009	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001	0.0003	0.0000	0.0000	0.0001	0.0000	0.0000	0.0010
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0004	0.0035	0.0202	0.0182	0.0050	0.0006	0.0000	0.0024	0.0020	0.0060	0.0016	0.0003	0.0178	0.0000	0.0003	0.0005
0.0000	0.0000	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0002	0.0001	0.0000	0.0000	0.0000
0.0000	0.0000	0.0001	0.0000	0.0119	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0002	0.0002	0.0006	0.0001	0.1044	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0001	0.0001
0.0003	0.0000	0.0007	0.0001	0.0013	0.0000	0.0000	0.0000	0.0000	0.0010	0.0000	0.0099	0.0001	0.0000	0.0001	0.0002
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0001	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000
0.0055	0.0002	0.0047	0.0007	0.0006	0.0001	0.0000	0.0002	0.0002	0.0171	0.0006	0.0017	0.0030	0.0000	0.0003	0.0012
0.0099	0.0004	0.0047	0.0012	0.0009	0.0001	0.0000	0.0003	0.0006	0.0011	0.0010	0.0026	0.0014	0.0000	0.0006	0.0053
0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0000	0.0000	0.0001	0.0313	0.0001	0.0001	0.0012	0.0000	0.0000	0.0000
0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0017	0.0113	0.0181	0.0204	0.0305	0.0075	0.0000	0.0130	0.0121	0.0229	0.0137	0.0440	0.0115	0.0000	0.2041	0.0429
0.0270	0.2934	0.1011	0.0704	0.0641	0.1183	0.0000	0.1547	0.1770	0.1843	0.0952	0.0500	0.0600	0.0000	0.0565	0.0897
0.0025	0.0062	0.0037	0.0018	0.0019	0.0023	0.0000	0.0031	0.0051	0.0039	0.0021	0.0126	0.0035	0.0000	0.0015	0.0074
0.0248	0.0253	0.0297	0.0083	0.0063	0.0089	0.0000	0.0119	0.0162	0.0175	0.0105	0.0269	0.0129	0.0000	0.0062	0.0191
0.0198	0.0052	0.0045	0.0012	0.0011	0.0018	0.0000	0.0024	0.0032	0.0039	0.0015	0.0046	0.0017	0.0000	0.0012	0.0023
0.0714	0.0164	0.0162	0.0041	0.0040	0.0059	0.0000	0.0079	0.0112	0.0194	0.0051	0.0193	0.0066	0.0000	0.0045	0.0095
0.0009	0.0039	0.0032	0.0014	0.0011	0.0015	0.0000	0.0019	0.0025	0.0029	0.0016	0.0016	0.0022	0.0000	0.0008	0.0026
0.0056	0.0286	0.0108	0.0066	0.0060	0.0100	0.0000	0.0131	0.0176	0.0169	0.0094	0.0359	0.0210	0.0000	0.0055	0.0109
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0006	0.0025	0.0008	0.0003	0.0002	0.0003	0.0000	0.0004	0.0005	0.0021	0.0003	0.0007	0.0004	0.0000	0.0004	0.0006
0.0003	0.0023	0.0102	0.0008	0.0005	0.0009	0.0000	0.0012	0.0015	0.0021	0.0018	0.0036	0.0019	0.0000	0.0004	0.0010
0.0203	0.0134	0.0075	0.0021	0.0020	0.0018	0.0000	0.0025	0.0036	0.0042	0.0020	0.0047	0.0033	0.0000	0.0020	0.0077

26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
0.0000	0.0000	0.0007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0000	0.0000
0.0000	0.0000	0.0391	0.0000	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0030	0.0076	0.0019	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0012	0.0000	0.0001	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0494	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0007	0.0000
0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0541	0.0000	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0036	0.0104	0.0026	0.0000
0.0000	0.0000	0.0016	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005	0.0001	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0005	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0005	0.0000	0.0000	0.0012	0.0037	0.0021	0.0000
0.0000	0.0000	0.0125	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0010	0.0024	0.0006	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0023	0.0000	0.0002	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0495	0.0011	0.0007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1.0002	0.0060	0.0003	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005
0.0000	1.0129	0.0001	0.0000	0.0001	0.0000	0.0002	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002
0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0002	1.0066	0.0277	0.0007	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0000
0.0001	0.0000	0.0002	0.0000	1.0043	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0003	0.0005	0.0000	0.0003	1.0001	0.0001	0.0000	0.0000	0.0024	0.0000	0.0000	0.0050	0.0000	0.0018	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0001	0.0004	0.0000	0.0001	0.0002	0.0000	0.0002	0.0000	1.0009	0.0000	0.0000	0.0000	0.0010	0.0004	0.0002
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000
0.0000	0.0000	0.0029	0.0000	0.0212	0.0001	0.0429	0.0006	0.0000	0.0001	0.0000	0.0000	0.0002	0.0000	1.0001	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000
0.0007	0.0048	0.0082	0.0006	0.0045	0.0007	0.0021	0.0009	0.0000	0.0232	0.0000	0.0000	0.0597	0.0006	0.0177	0.0005
0.0000	0.0000	0.0000	0.0000	0.0016	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0121	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0008	0.0000
0.0000	0.0001	0.0003	0.0001	0.0002	0.0001	0.0004	0.0223	0.0000	0.0010	0.0000	0.0000	0.0001	0.0000	0.0074	0.0001
0.0000	0.0000	0.0001	0.0000	0.0014	0.0000	0.0003	0.0008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0003
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0002	0.0001	0.0004	0.0003	0.0045	0.0001	0.0004	0.0004	0.0000	0.0001	0.0000	0.0000	0.0005	0.0007	0.0009	0.0008
0.0005	0.0001	0.0005	0.0003	0.0008	0.0001	0.0008	0.0007	0.0000	0.0004	0.0000	0.0000	0.0002	0.0015	0.0016	0.0013
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000
0.0000	0.0001	0.0006	0.0000	0.0000	0.0000	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0396	0.0170	0.0124	0.0144	0.0168	0.0138	0.0168	0.0324	0.0000	0.0522	0.0000	0.0000	0.0163	0.0145	0.0106	0.0309
0.0836	0.0604	0.1022	0.1181	0.1217	0.0301	0.0750	0.0459	0.0000	0.1081	0.0000	0.0000	0.0594	0.0694	0.0918	0.0899
0.0018	0.0045	0.0022	0.0057	0.0050	0.0012	0.0128	0.0046	0.0000	0.0033	0.0000	0.0000	0.0021	0.0016	0.0021	0.0089
0.0074	0.0136	0.0200	0.0192	0.0193	0.0039	0.0161	0.0121	0.0000	0.0181	0.0000	0.0000	0.0226	0.0093	0.0133	0.0208
0.0014	0.0014	0.0017	0.0024	0.0023	0.0006	0.0028	0.0021	0.0000	0.0020	0.0000	0.0000	0.0023	0.0011	0.0015	0.0025
0.0046	0.0057	0.0055	0.0087	0.0082	0.0022	0.0127	0.0082	0.0000	0.0067	0.0000	0.0000	0.0040	0.0038	0.0049	0.0102
0.0013	0.0030	0.0034	0.0023	0.0045	0.0006	0.0076	0.0016	0.0000	0.0020	0.0000	0.0000	0.0037	0.0012	0.0018	0.0032
0.0073	0.0074	0.0100	0.0119	0.0122	0.0029	0.0128	0.0105	0.0000	0.0102	0.0000	0.0000	0.0068	0.0070	0.0083	0.0119
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0003	0.0004	0.0006	0.0006	0.0006	0.0001	0.0005	0.0032	0.0000	0.0006	0.0000	0.0000	0.0006	0.0003	0.0004	0.0006
0.0006	0.0010	0.0015	0.0010	0.0013	0.0002	0.0016	0.0006	0.0000	0.0009	0.0000	0.0000	0.0010	0.0013	0.0009	0.0013
0.0016	0.0035	0.0034	0.0049	0.0044	0.0014	0.0094	0.0068	0.0000	0.0040	0.0000	0.0000	0.0035	0.0018	0.0023	0.0075

42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0001	0.0000	0.0045	0.1018	0.0000	0.0000	0.0004	0.0000	0.0004	0.0001	0.0003	0.0000	0.0000	0.0007	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0001	0.0000	0.0003	0.0001	0.0001	0.0000	0.0000	0.0001	0.0001	0.0001	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0002	0.0000	0.0000	0.0001	0.0000	0.0000	0.0053	0.0000	0.0002	0.0003	0.0008	0.0000	0.0000	0.0000	0.0000	0.0000
0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0011	0.0008	0.0005	0.0013	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0002	0.0001	0.0001	0.0005	0.0001	0.0000	0.0002	0.0001	0.0001	0.0170	0.0002	0.0000	0.0000	0.0001	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0002	0.0015	0.0001	0.0003	0.0000	0.0000	0.0000	0.0059	0.0001	0.0013	0.0000	0.0000	0.0000	0.0004	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0032	0.0219	0.0000	0.0002	0.0000	0.0000	0.0539	0.0212	0.0005	0.0035	0.0018	0.0000	0.0000	0.0587	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1.0070	0.0008	0.0002	0.0051	0.0012	0.0000	0.0075	0.0016	0.0013	0.0019	0.0061	0.0000	0.0000	0.0084	0.0000	0.0000
0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0001	0.0000	1.0041	0.1228	0.0001	0.0000	0.0005	0.0000	0.0001	0.0002	0.0004	0.0000	0.0000	0.0008	0.0000	0.0000
0.0008	0.0002	0.0002	1.0732	0.0002	0.0000	0.0045	0.0002	0.0011	0.0015	0.0033	0.0000	0.0000	0.0074	0.0000	0.0000
0.0003	0.0001	0.0005	0.0129	1.3000	0.0000	0.0263	0.0291	0.0072	0.0240	0.0229	0.0000	0.0000	0.0099	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0001	0.0008	0.0001	0.0000	0.0000	1.0222	0.0000	0.0035	0.0033	0.0000	0.0000	0.0000	0.0000	0.0000
0.0007	0.0001	0.0024	0.0025	0.0008	0.0000	0.0093	0.0051	1.0005	0.0021	0.0053	0.0000	0.0000	0.0007	0.0000	0.0000
0.0011	0.0016	0.0040	0.0029	0.0005	0.0000	0.0017	0.0010	0.0011	1.0077	0.0029	0.0000	0.0000	0.0006	0.0000	0.0000
0.0003	0.0000	0.0001	0.0005	0.0001	0.0000	0.0000	0.0002	0.0004	0.0002	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0004	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0385	0.0295	0.1111	0.0390	0.0429	0.0000	0.0203	0.0151	0.0162	0.0154	0.0162	0.0000	0.0000	0.0238	0.0000	0.0000
0.1137	0.0689	0.0326	0.0926	0.2435	0.0000	0.1507	0.1281	0.0672	0.1106	0.0482	0.0000	0.0000	0.0575	0.0000	0.0000
0.0084	0.0044	0.0146	0.0075	0.0050	0.0000	0.0070	0.0052	0.0055	0.0074	0.0094	0.0000	0.0000	0.0033	0.0000	0.0000
0.0241	0.0088	0.0123	0.0176	0.0207	0.0000	0.0239	0.0180	0.0130	0.0260	0.0043	0.0000	0.0000	0.0247	0.0000	0.0000
0.0028	0.0012	0.0049	0.0026	0.0038	0.0000	0.0030	0.0024	0.0017	0.0025	0.0019	0.0000	0.0000	0.0013	0.0000	0.0000
0.0108	0.0053	0.0221	0.0104	0.0127	0.0000	0.0108	0.0086	0.0068	0.0098	0.0092	0.0000	0.0000	0.0049	0.0000	0.0000
0.0051	0.0010	0.0019	0.0037	0.0033	0.0000	0.0061	0.0035	0.0030	0.0055	0.0040	0.0000	0.0000	0.0051	0.0000	0.0000
0.0141	0.0076	0.0213	0.0125	0.0209	0.0000	0.0155	0.0124	0.0086	0.0130	0.0084	0.0000	0.0000	0.0085	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0007	0.0003	0.0004	0.0005	0.0007	0.0000	0.0007	0.0005	0.0004	0.0007	0.0002	0.0000	0.0000	0.0006	0.0000	0.0000
0.0020	0.0006	0.0020	0.0012	0.0018	0.0000	0.0017	0.0011	0.0012	0.0015	0.0008	0.0000	0.0000	0.0023	0.0000	0.0000
0.0072	0.0058	0.0161	0.0094	0.0052	0.0000	0.0065	0.0044	0.0058	0.0085	0.0068	0.0000	0.0000	0.0059	0.0000	0.0000

58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000
0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0010	0.0054	0.0003	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0008	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0001	0.0697	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0008	0.0000	0.0001	0.0002	0.0000	0.0006
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0005	0.0064	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0011	0.0000	0.0000
0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0022	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0006	0.0000	0.0000
0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0004	0.0017	0.0003	0.0000
0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0014	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0003	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0001	0.0002	0.0000	0.0000	0.0000	0.0001	0.0001	0.0003	0.0000	0.0000	0.0000	0.0001	0.0006	0.0000	0.0001
0.0000	0.0001	0.0001	0.0002	0.0002	0.0001	0.0001	0.0002	0.0000	0.0000	0.0000	0.0003	0.0004	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0003	0.0052	0.0007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0001	0.0000	0.0000	0.0001
0.0001	0.0008	0.0032	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0003	0.0001	0.0000
0.0001	0.0009	0.0002	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0055	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0041	0.0004	0.0004	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0002	0.0002	0.0001	0.0008
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0060	0.0000	0.0015	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0009	0.0022	0.0173	0.0001	0.0051	0.0000	0.0001	0.0003	0.0000	0.0002	0.0000	0.0005	0.0002	0.0000	0.0001
0.0016	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0001	0.0002	0.0531	0.0002	0.0000	0.0000	0.0001	0.0008	0.0000	0.0011	0.0000	0.0017	0.0010	0.0001	0.0008
0.0002	0.0013	0.2009	0.0004	0.0002	0.0002	0.0002	0.0011	0.0000	0.0081	0.0001	0.0011	0.0017	0.0003	0.0063
0.0271	0.0019	0.1481	0.0003	0.0001	0.0000	0.0001	0.0000	0.0000	0.0001	0.0000	0.0004	0.0001	0.0000	0.0001
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0001	0.0626	0.0003	0.0000	0.0000	0.0001	0.0006	0.0000	0.0005	0.0000	0.0003	0.0001	0.0001	0.0007
0.0014	0.0007	0.0128	0.0013	0.0004	0.0001	0.0007	0.0005	0.0000	0.0003	0.0000	0.0003	0.0003	0.0003	0.0003
0.0020	0.0012	0.0019	0.0028	0.0003	0.0002	0.0016	0.0004	0.0000	0.0001	0.0001	0.0004	0.0005	0.0004	0.0003
0.0002	0.0000	0.0003	0.0008	0.0000	0.0000	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0001	1.0007	0.0000	0.0001	0.0001	0.0001	0.0000	0.0002	0.0000	0.0003	0.0000	0.0011	0.0001	0.0001	0.0002
0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0148	0.0263	0.0209	1.0206	0.0112	0.0081	0.0087	0.0089	0.0000	0.0190	0.0025	0.0550	0.1497	0.0862	0.0079
0.0780	0.0732	0.1918	0.0099	1.0058	0.0038	0.0108	0.0054	0.0000	0.0039	0.0018	0.0081	0.0090	0.0044	0.0056
0.0035	0.0037	0.0066	0.0019	0.0192	1.0069	0.0091	0.0159	0.0001	0.0066	0.0116	0.0090	0.0038	0.0080	0.0007
0.0151	0.0214	0.0153	0.0058	0.0339	0.0034	1.0155	0.0176	0.0001	0.0037	0.0113	0.0122	0.0051	0.0039	0.0086
0.0027	0.0015	0.0035	0.0019	0.0151	0.0098	0.0052	1.0282	0.0001	0.0017	0.0135	0.0141	0.0071	0.0108	0.0015
0.0070	0.0057	0.0124	0.0089	0.0494	0.0207	0.0124	0.0119	1.0001	0.0039	0.0132	0.0197	0.0085	0.0206	0.0024
0.0016	0.0046	0.0035	0.0004	0.0124	0.0129	0.0019	0.0141	0.0001	1.0018	0.0046	0.0081	0.0035	0.0154	0.0121
0.0107	0.0087	0.0183	0.0046	0.0832	0.0353	0.0327	0.0353	0.0004	0.0025	1.0421	0.0226	0.0122	0.0557	0.0033
0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0014	0.0000	0.0000
0.0464	0.0006	0.0006	0.0013	0.0016	0.0002	0.0230	0.0004	0.0000	0.0001	0.0003	0.0266	1.0126	0.0035	0.0002
0.0010	0.0015	0.0016	0.0002	0.0074	0.0225	0.0015	0.0011	0.0000	0.0016	0.0177	0.0059	0.0024	1.1077	0.0004
0.0040	0.0042	0.0065	0.0060	0.0148	0.0136	0.0120	0.0292	0.0000	0.1334	0.0103	0.0206	0.0109	0.0221	1.0106

APPENDIX C

ECONOMIC POTENTIAL BY *MUNICIPIO*

MUNICIPIO	Potential
ABALA	2.9259
ACANCEH	4.2738
AKIL	2.6881
BACA	3.2853
BOKOBA	2.2767
BUCTZOTZ	1.9019
CACALCHEN	3.2754
CALOTMUL	1.1773
CANSAHCAB	2.6618
CANTAMAYEC	1.0339
CELESTUN	1.5479
CENOTILLO	1.3000
CONKAL	4.2364
CUNCUNUL	0.2947
CUZAMA	2.6428
CHACSINKIN	0.9016
CHANKOM	1.3406
CHAPAB	2.2697
CHEMAX	1.9995
CHICXULUB PUEBLO	2.7490
CHICHIMILA	2.1490
CHIKINDZONOT	0.7329
CHOCHOLA	2.7195
CHUMAYEL	1.8356
DZAN	2.9204
DZEMUL	2.6939
DZIDZANTUN	2.4221
DZILAM DE BRAVO	0.3792
DZILAM GONZALEZ	1.6938
DZITAS	1.4943
DZONCAUICH	1.3896
ESPITA	2.2627
HALACHO	2.9988
HOCABA	3.0338
HOCTUN	3.0484
HOMUN	2.8919
HUHI	2.2495
HUNUCMA	4.1228
IXIL	2.3837
IZAMAL	3.8946
KANASIN	5.9425
KANTUNIL	2.2401
KAUA	0.8037
KINCHIL	2.2415
KOPOMA	1.8404
MAMA	2.0278
MANI	2.5048
MAXCANU	3.2117
MAYAPAN	1.4520
MERIDA	7.1588
MOCOCHA	2.8244
MOTUL	4.5891
MUNA	3.2541
MUXUPIP	2.7670
OPICHEN	2.3398

OXKUTZCAB	3.3679
PANABA	1.5962
PETO	2.4346
PROGRESO	5.0477
QUINTANA ROO	0.3020
RIO LAGARTOS	0.3633
SACALUM	2.4362
SAMAHIL	2.6092
SANAHCAT	1.8244
SAN FELIPE	0.0000
SANTA ELENA	1.2506
SEYE	3.5257
SINANCHE	2.0322
SOTUTA	2.5868
SUCILA	1.0628
SUDZAL	0.8691
SUMA	2.0514
TAHDZIU	1.0597
TAHMEK	2.8663
TEABO	2.0346
TECOH	3.8363
TEKAL DE VENEGAS	1.6415
TEKANTO	2.7017
TEKAX	3.1336
TEKIT	2.8389
TEKOM	0.8569
TELCHAC PUEBLO	2.6701
TELCHAC PUERTO	1.1376
TEMAX	2.3872
TEMOZON	2.0873
TEPAKAN	2.0168
TETIZ	2.4000
TEYA	2.0068
TICUL	4.1667
TIMUCUY	3.9264
TINUM	2.0662
TIXCACALCUPUL	1.1421
TIXKOKOB	4.3730
TIXMEUAC	1.5082
TIXPEUAL	3.8148
TIZIMIN	2.8880
TUNKAS	1.4291
TZUCACAB	2.0664
UAYMA	1.0321
UCU	3.0917
UMAN	5.5564
VALLADOLID	3.3693
XOCCHEL	2.4277
YAXCABA	2.4595
YAXKUKUL	2.8012
YOBAIN	1.5920

Appendix C.1 Measures of economic potential by *municipio*

APPENDIX D

REGIONAL INPUT-OUTPUT TABLES AND MULTIPLIERS

	INDUSTRY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	HH	OTHER FD	Total Output
1	Agriculture	37058	0	71311	15415	0	0	0	0	0	0	0	0	0	0	0	0	0	0	137383	114617	375784
2	Mining	0	0	244	0	0	0	356	6287	0	0	0	17015	0	0	0	0	0	0	0	19099	43002
3	Food products	13301	2	6917	641	3	2	23	22	0	1	0	86	3	2558	175	126	1363	0	145906	186153	357283
4	Textile products	333	5	204	14082	7	7	25	41	1	4	5	88	11	2879	229	134	1111	0	127276	154442	300887
5	Wood products	234	3	379	178	1356	14	32	36	0	84	150	4587	20	2999	206	241	1233	0	24450	4855	41057
6	Paper products	0	0	311	88	3	1	17	31	0	46	6	0	0	44	0	0	0	0	27934	11425	39906
7	Chemical products	1146	7	1985	752	178	667	242	284	1	226	12	5366	12	7633	437	319	2241	0	18895	26300	66704
8	Non-metallic products	652	8	1467	415	13	7	125	4548	2	14	4	28031	15	8800	638	862	3431	0	1798	78598	129428
9	Basic metal products	335	4	305	214	5	4	11	89	331	27	1	3241	6	4580	312	225	1547	0	0	5168	16405
10	Machinery and equipment	1350	44	257	164	16	7	20	158	4	60	3	6010	35	2564	259	149	906	0	9165	10406	31576
11	Other manufacturing	15	1	0	15	0	7	1	0	0	1	4	0	2	5	10	39	145	0	6801	6223	13270
12	Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	254440	254440
13	Public utilities	254	344	831	2236	180	216	787	4581	378	174	121	0	363	0	0	1308	14563	862	32179	-10350	49026
14	Commerce, hotels and restaurants	22550	1077	41625	24820	4747	3383	7246	14680	6405	3537	1000	91259	602	56090	8833	4555	20808	1146	501100	574998	1390462
15	Transportation and communications	4804	540	2165	2866	585	569	1223	2683	325	482	258	1257	338	18088	8300	149	6928	2192	291759	17683	363193
16	Financial services and real estate	0	3529	0	0	352	1648	1053	5679	18	554	194	0	1128	53331	9217	0	9504	1046	204025	17026	308303
17	Personal and professional services	3304	689	2414	1319	111	377	458	2605	26	238	45	151	376	68561	15109	31484	32755	2898	542337	102143	807399
18	Maquiladora industries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	165416	165416
	Employment	110057	1752	12211	7734	2319	1465	2361	2586	119	2535	227	11452	3266	42815	6271	956	29295	2635			
	Labor	144144	118	56717	61683	2998	5541	6306	14074	1742	3300	2012	40947	28368	70848	41159	42858	152777	16521			
	Value added	71736	16776	38159	63267	27514	10218	19729	50108	2298	6411	2007	44984	-7439	211401	71214	119235	212242	16428			
	Total local inputs	85336	6253	130416	63207	7555	6910	11619	41724	7491	5448	1803	157090	2912	228134	43725	39591	96536	8144			
	Imported inputs	74568	19855	131992	112730	2991	17237	29050	23522	4874	16417	7448	11418	25185	880079	207095	106619	345844	124323			
	Total Outlays	375784	43002	357283	300887	41057	39906	66704	129428	16405	31576	13270	254440	49026	1390462	363193	308303	807399	165416	2071008		

Table D.1 Regional input-output table, 1988

	INDUSTRY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	HH	OTHER FD	Total Output
1	Agriculture	188395	0	223414	12376	0	0	1	0	0	0	2	0	0	0	0	0	1382	0	472626	394308	1292778
2	Mining	0	0	2111	0	0	0	565	15292	0	4	0	61948	0	0	0	0	0	0	0	63886	143845
3	Food products	45115	0	17265	241	1	0	26	0	0	0	0	0	1	0	0	0	1852	0	373327	476306	914173
4	Textile products	486	8	79	6454	10	11	28	44	0	7	22	0	37	571	233	38	833	0	58849	71410	139122
5	Wood products	71	0	476	19	2548	27	37	27	0	189	668	16068	76	189	31	760	926	0	46022	9139	77283
6	Paper products	0	0	799	41	6	1	25	74	0	103	27	0	0	130	0	0	0	0	61743	25252	88204
7	Chemical products	2379	3	4030	213	325	1464	342	554	0	506	49	18459	20	3219	60	106	536	0	28355	39469	100103
8	Non-metallic products	30	0	2268	1	11	0	157	10746	1	21	14	99261	19	2	177	3350	1718	0	4320	188878	311028
9	Basic metal products	1	0	7	0	2	1	1	118	341	56	4	11051	1	2	0	0	12	0	0	5335	16937
10	Machinery and equipment	4016	140	233	22	25	11	21	329	4	133	13	21207	148	130	408	203	226	0	20826	23645	71750
11	Other manufacturing	58	2	0	7	0	15	2	0	0	2	17	0	11	55	54	313	562	0	30269	27697	59063
12	Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	910582	910582
13	Public utilities	4639	1199	4657	1358	363	505	1232	11321	392	412	544	0	1786	7213	3345	15956	72559	2796	150784	-48499	229725
14	Commerce, hotels and restaurants	68348	3485	100300	10681	8875	7411	10748	34512	6607	7993	4435	322193	2608	44001	29470	21465	31160	3718	1138980	1306947	3160463
15	Transportation and communications	21704	1872	9020	1771	1134	1294	1907	6876	339	1121	1155	6967	1705	87950	45205	9071	51332	7108	1358919	82362	1691634
16	Financial services and real estate	17774	12131	5672	1745	830	3829	1932	15771	33	1379	904	0	5879	353123	75352	22668	162427	3390	1592779	132918	2406852
17	Personal and professional services	10237	2290	5416	513	201	825	672	6166	26	535	200	0	1736	145618	68944	244065	115568	9398	2006384	377878	2986986
18	Maquiladora industries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	318532	318532
	Employment	108583	1366	19406	19507	2388	2419	2015	4019	421	4397	900	5885	2145	81289	10319	1869	34356	5347			
	Labor	495886	23331	79274	28693	13314	21605	13593	31459	1022	15260	20075	146124	101092	597324	289975	133782	930607	53480			
	Value added	246788	76735	230133	31576	18306	22861	28771	100267	1843	20520	13426	160479	-89994	1495071	777856	893852	745077	10118			
	Total local inputs	363690	21113	376269	35477	14339	15396	17702	101855	7750	12466	8057	557769	14019	641541	223084	317641	440666	26410			
	Imported inputs	157229	22666	228225	43377	31324	28342	40037	76949	6321	21879	17505	46210	204609	426527	400720	1061577	746769	228524			
	Total Outlays	1292778	143845	914173	139122	77283	88204	100103	311028	16937	71750	59063	910582	229725	3160463	1691634	2406852	2986986	318532	7344183		

Table D.2 Regional input-output table, 1993

	INDUSTRY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	HH	OTHER FD	Total Output
1	Agriculture	237002	0	584086	69311	0	0	0	0	0	0	0	0	0	0	0	0	0	0	988216	824461	2703076
2	Mining	0	0	0	0	0	0	519	30479	0	0	0	27469	0	0	0	0	0	0	0	46714	105181
3	Food products	96005	0	67158	2052	8	0	63	160	0	36	5	3248	42	18630	5709	13867	34075	0	1394405	1779039	3414504
4	Textile products	1262	6	687	48311	21	21	60	143	3	42	55	478	74	4371	1529	2165	7064	0	440161	534108	1040561
5	Wood products	0	0	0	0	5198	4	2	0	0	765	1615	37932	0	0	1	0	0	0	94694	18805	159016
6	Paper products	0	0	1245	146	8	0	45	95	1	548	65	0	0	0	0	0	0	0	109944	44965	157061
7	Chemical products	0	0	2137	395	640	2579	656	714	0	2621	98	56557	0	0	0	0	0	0	58327	81188	205913
8	Non-metallic products	0	0	0	1	0	0	35	24107	0	0	0	292168	0	5	0	0	0	0	11597	507042	834955
9	Basic metal products	499	0	818	74	5	3	4	363	1993	319	11	44230	15	5538	1695	4118	8151	0	0	31197	99034
10	Machinery and equipment	9601	104	2792	340	56	23	50	997	23	762	35	85363	303	13783	5313	10637	20482	0	115021	130588	396272
11	Other manufacturing	94	1	0	52	0	26	3	0	0	11	42	0	20	0	66	788	1611	0	74886	68522	146123
12	Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3765620	3765620
13	Public utilities	1710	865	4646	8975	718	873	2488	29628	2283	2106	1322	0	3103	0	0	0	134872	41828	278537	-89591	424363
14	Commerce, hotels and restaurants	119962	2513	338012	76485	18181	13120	21975	90458	38604	43652	10905	1196372	4252	0	8699	0	0	55622	3249890	3729156	9017858
15	Transportation and communications	42413	1365	28955	12808	2323	2294	3905	18175	1977	6125	2850	21072	3077	217917	123282	4735	139205	106349	4010351	243061	4992239
16	Financial services and real estate	39395	8874	24748	13384	1715	6826	3968	42549	196	7665	2243	4332	10916	1032423	229989	91770	630109	50727	5148701	429662	7780212
17	Personal and professional services	25003	1680	25974	4368	427	1481	1403	16896	159	3033	506	6986	3295	455561	215741	818767	481137	140613	7333580	1381191	10917800
18	Maquiladora industries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3624687	3624687
	Employment	106170	1166	20149	31069	2853	2749	3881	3317	301	4177	1420	19631	3806	84122	12099	5976	44903	15899			
	Labor	1036851	12596	209692	304486	29643	25766	33476	79493	4445	41098	53963	810897	72685	1441045	673577	826077	3140574	380526			
	Value added	577033	35597	611436	168113	32877	31749	14888	379770	8073	94512	47410	773466	86901	4146825	1854992	3505244	3131462	230191			
	Total local inputs	572947	15407	1081257	236703	29300	27250	35196	254763	45239	67683	19752	1776208	25097	1748227	592025	946847	1456707	395139			
	Imported inputs	516245	41581	1512118	331259	67195	72296	122351	120929	41277	192979	24978	405049	239480	1681761	1871645	2502044	3189057	2618831			
	Total Outlays	2703076	105181	3414504	1040561	159016	157061	205913	834955	99034	396272	146123	3765620	424363	9017858	4992239	7780212	10917800	3624687	23308311		

Table D.3 Regional input-output table, 1998

YUCATAN	OUTPUT	INCOME	EMPLOYMENT
Agriculture	1.949	1.438	1.248
Mining	1.209	12.759	1.129
Food products	1.855	2.079	3.734
Textile products	1.633	1.528	2.645
Wood products	1.355	1.555	1.248
Paper products	1.441	1.434	1.463
Chemical products	1.378	1.533	1.414
Non-metallic products	1.618	1.819	2.169
Basic metal products	1.778	1.811	4.861
Machinery and equipment	1.388	1.471	1.187
Other manufacturing	1.410	1.382	2.008
Construction	2.082	1.670	1.884
Public utilities	1.939	1.259	1.673
Commerce, hotels and restaurants	1.306	1.849	1.349
Transportation and communications	1.335	1.441	1.768
Financial services and real estate	1.393	1.471	6.628
Personal and professional services	1.458	1.408	1.569
Maquiladora industries	1.218	1.359	1.151

Table D.4 Type II multipliers for Yucatán (1988)

YUCATAN	OUTPUT	INCOME	EMPLOYMENT
Agriculture	2.177	1.696	1.369
Mining	1.478	1.552	1.343
Food products	1.946	3.755	2.807
Textile products	1.801	1.878	1.326
Wood products	1.572	1.652	1.291
Paper products	1.665	1.529	1.292
Chemical products	1.499	1.727	1.302
Non-metallic products	1.684	2.309	1.721
Basic metal products	1.847	3.614	2.913
Machinery and equipment	1.625	1.580	1.247
Other manufacturing	1.764	1.453	1.581
Construction	2.253	2.415	4.809
Public utilities	1.804	1.372	2.138
Commerce, hotels and restaurants	1.606	1.606	1.319
Transportation and communications	1.481	1.566	1.934
Financial services and real estate	1.316	2.358	7.540
Personal and professional services	1.754	1.502	2.133
Maquiladora industries	1.405	1.511	1.102

Table D.5 Type II multipliers for Yucatán (1993)

YUCATAN	OUTPUT	INCOME	EMPLOYMENT
Agriculture	1.946	1.504	1.238
Mining	1.390	1.570	1.176
Food products	1.649	3.495	2.791
Textile products	1.831	1.596	1.301
Wood products	1.562	1.546	1.230
Paper products	1.505	1.549	1.186
Chemical products	1.501	1.552	1.174
Non-metallic products	1.592	2.042	1.937
Basic metal products	1.762	3.820	2.827
Machinery and equipment	1.413	1.703	1.265
Other manufacturing	1.764	1.385	1.514
Construction	2.051	1.817	1.951
Public utilities	1.346	1.376	1.227
Commerce, hotels and restaurants	1.523	1.593	1.260
Transportation and communications	1.380	1.534	1.719
Financial services and real estate	1.357	1.729	3.521
Personal and professional services	1.634	1.418	1.871
Maquiladora industries	1.322	1.591	1.113

Table D.6 Type II multipliers for Yucatán (1998)

APPENDIX E

INTER-REGIONAL INPUT-OUTPUT TABLES AND MULTIPLIERS

		MERIDA																		
	INDUSTRY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	HH
	1 Agriculture	14	0	1359	299	0	0	0	0	0	0	0	0	0	0	0	0	0	0	998
	2 Mining	0	0	0	0	0	0	0	11	0	0	0	32	0	0	0	0	0	0	0
	3 Food products	188	0	4764	450	1	2	11	15	0	1	0	59	2	1801	115	96	940	0	38315
	4 Textile products	5	0	148	10414	3	6	12	28	1	3	2	64	8	2136	159	107	807	0	80140
	5 Wood products	1	0	61	29	134	3	3	6	0	15	15	745	3	498	32	43	200	0	3444
	6 Paper products	0	0	256	74	2	1	9	24	0	41	3	0	0	37	0	0	0	0	19943
M	7 Chemical products	10	0	834	322	45	336	67	113	1	104	3	2255	5	3278	175	148	943	0	6888
E	8 Non-metallic products	9	0	1004	289	6	6	57	2958	2	10	2	19190	10	6157	417	651	2352	0	1068
R	9 Basic metal products	6	0	250	179	2	4	6	69	323	24	1	2655	5	3834	244	204	1269	0	0
I	10 Machinery and equipment	21	0	192	125	7	6	10	113	3	49	1	4504	25	1964	185	123	680	0	5960
D	11 Other manufacturing	0	0	0	7	0	4	0	0	0	0	1	0	1	3	4	20	67	0	2716
A	12 Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	13 Public utilities	4	1	565	1550	74	176	353	2961	306	130	49	0	235	0	0	982	9919	758	18997
	14 Commerce, hotels and restaurants	327	2	29403	17868	2033	2865	3379	9851	5393	2738	420	64472	406	40498	5951	3553	14716	1003	307160
	15 Transportation and communications	67	1	1473	1987	241	464	549	1734	264	360	104	855	220	12578	5385	112	4718	1927	172237
	16 Financial services and real estate	0	6	0	0	162	1503	529	4103	16	462	88	0	818	41458	6685	0	7236	919	134649
	17 Personal and professional services	45	1	1589	885	44	297	199	1630	21	172	18	99	236	46147	9489	22890	21594	2548	309905
	18 Maquiladora industries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Employment	5157	442	6731	4263	1264	808	1301	1425	66	1397	61	4842	1901	27855	2654	632	19364	1972	
	Labor	3315	18	44827	47952	1718	3097	3571	9239	1000	1802	1101	21103	20123	60373	21307	34101	123089	1202	
	Value added	1650	26	25999	59826	1032	10174	7977	43697	2286	5890	1716	36264	-6612	175139	57706	111515	166503	1413	
	1 Agriculture	615	0	57710	12714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42392
	2 Mining	0	0	202	0	0	0	194	4936	0	0	0	14064	0	0	0	0	0	0	0
	3 Food products	38	0	966	91	0	0	2	3	0	0	0	12	0	365	23	19	191	0	7768
	4 Textile products	1	0	21	1474	0	1	2	4	0	0	0	9	1	302	22	15	114	0	11344
	5 Wood products	3	0	252	121	548	12	14	23	0	62	60	3055	13	2041	131	177	822	0	14129
	6 Paper products	0	0		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	136
	7 Chemical products	10	0	810	313	44	327	65	110	1	101	3	2191	5	3185	170	144	916	0	6693
R	8 Non-metallic products	2	0	211	61	1	1	12	621	0	2	0	4031	2	1294	88	137	494	0	224
U	9 Basic metal products	0	0	3	2	0	0	0	1	4	0	0	30	0	43	3	2	14	0	0
R	10 Machinery and equipment	2	0	20	13	1	1	1	12	0	5	0	474	3	207	19	13	72	0	628
A	11 Other manufacturing	0	0	0	6	0	3	0	0	0	0	1	0	1	2	4	16	54	0	2172
L	12 Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	13 Public utilities	1	0	123	337	16	38	77	644	67	28	11	0	51	0	0	214	2158	0	4133
	14 Commerce, hotels and restaurants	56	0	5076	3084	351	495	583	1701	931	473	73	11129	70	6991	1027	613	2540	0	53024
	15 Transportation and communications	15	0	320	432	52	101	120	377	57	78	23	186	48	2737	1172	24	1027	0	37475
	16 Financial services and real estate	0	1	0	0	14	134	47	366	1	41	8	0	73	3695	596	0	645	0	12002
	17 Personal and professional services	12	0	410	228	11	77	51	420	5	44	5	26	61	11901	2447	5903	5569	0	79919
	18 Maquiladora industries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Employment	0	0	1333	647	0	623	17	413	48	792	0	3046	349	1867	1665	80	1845	411	
	Labor	0	0	8877	7278	0	2388	47	2678	728	1022	0	13276	3694	4047	13367	4317	11728	2689	
	Value added	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total local inputs	1451	11	108026	53357	3795	6861	6353	32834	7396	4946	888	130137	2300	193150	34543	36207	80057	7161	
	Imported inputs	2227	44	109331	95163	1502	17115	15884	18510	4812	14907	3669	8193	20759	753060	171370	96932	260495	9364	
	Total Outlays	8643	98	297061	263576	8047	39635	33831	106958	16223	28567	7374	208972	40265	1185768	298292	283071	641871	12965	1374460

		RURAL																				
	INDUSTRY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	HH	OTHER FD	Total Output
	1 Agriculture	838	0	282	55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2626	2172	8643
	2 Mining	0	0	0	0	0	0	0	3	0	0	0	7	0	0	0	0	0	0	0	44	98
	3 Food products	10871	2	987	83	1	0	9	4	0	0	0	12	1	326	30	9	193	0	100817	136957	297061
	4 Textile products	287	4	31	1922	3	0	10	8	0	0	2	13	2	387	42	10	166	0	28759	137885	263576
	5 Wood products	45	1	13	5	132	0	3	2	0	2	15	154	1	90	8	4	41	0	1236	1063	8047
	6 Paper products	0	0	53	14	2	0	7	7	0	4	3	0	0	7	0	0	0	0	7156	11993	39635
M	7 Chemical products	571	4	173	59	45	2	56	31	0	11	3	467	1	594	47	14	194	0	2472	13562	33831
E	8 Non-metallic products	529	7	208	53	5	0	47	801	0	1	2	3974	3	1115	111	61	484	0	383	64987	106958
R	9 Basic metal products	325	4	52	33	2	0	5	19	4	2	1	550	1	694	65	19	261	0	0	5110	16223
I	10 Machinery and equipment	1201	40	40	23	7	0	8	31	0	5	1	933	7	356	49	12	140	0	2139	9607	28567
D	11 Other manufacturing	8	0	0	1	0	0	0	0	0	0	1	0	0	0	1	2	14	0	975	3546	7374
A	12 Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	208972	208972
	13 Public utilities	205	282	117	286	73	1	293	802	4	13	50	0	63	0	0	92	2042	104	6817	-8040	40265
	14 Commerce, hotels and restaurants	18904	917	6094	3298	2014	20	2801	2667	69	278	433	13353	108	7335	1582	332	3029	138	110225	500128	1185768
	15 Transportation and communications	3878	443	305	367	239	3	455	469	3	36	107	177	58	2278	1432	10	971	265	61808	19709	298292
	16 Financial services and real estate	0	3234	0	0	161	11	438	1111	0	47	90	0	217	7509	1777	0	1490	126	48319	19907	283071
	17 Personal and professional services	2582	547	329	163	44	2	165	441	0	17	18	21	63	8358	2522	2140	4445	350	111210	90643	641871
	18 Maquiladora industries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	129657	129657
	Employment	0	660	0	0	14	0	0	0	0	0	64	0	0	0	0	0	0	11			
	Labor	0	50	0	0	17	0	0	0	0	0	351	0	0	0	0	0	0	228			
	Value added	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2292			
	1 Agriculture	35590	0	11961	2347	0	0	0	0	0	0	0	0	0	0	0	0	0	0	111545	92266	367141
	2 Mining	0	0	42	0	0	0	161	1337	0	0	0	2913	0	0	0	0	0	0	0	19055	42904
	3 Food products	2204	0	200	17	0	0	2	1	0	0	0	2	0	66	6	2	39	0	20438	27765	60222
	4 Textile products	41	1	4	272	0	0	1	1	0	0	0	2	0	55	6	1	24	0	4071	19519	37311
	5 Wood products	185	2	52	22	543	0	11	6	0	6	61	633	3	370	35	17	169	0	5070	4361	33010
	6 Paper products	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49	82	271
	7 Chemical products	555	3	168	58	44	2	54	30	0	10	3	454	1	577	45	13	189	0	2402	13178	32873
R	8 Non-metallic products	111	1	44	11	1	0	10	168	0	0	0	835	1	234	23	13	102	0	81	13653	22470
U	9 Basic metal products	4	0	1	0	0	0	0	0	0	0	0	6	0	8	1	0	3	0	0	57	182
R	10 Machinery and equipment	126	4	4	2	1	0	1	3	0	1	0	98	1	37	5	1	15	0	225	1012	3009
A	11 Other manufacturing	7	0	0	1	0	0	0	0	0	0	1	0	0	0	1	1	11	0	779	2835	5896
L	12 Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45468	45468
	13 Public utilities	45	61	26	62	16	0	64	174	1	3	11	0	14	0	0	20	444	0	1483	-1562	8761
	14 Commerce, hotels and restaurants	3263	158	1052	569	348	4	483	460	12	48	75	2305	19	1266	273	57	523	0	19028	86533	204694
	15 Transportation and communications	844	96	66	80	52	1	99	102	1	8	23	39	13	496	311	2	211	0	13448	4765	64901
	16 Financial services and real estate	0	288	0	0	14	1	39	99	0	4	8	0	19	669	158	0	133	0	4307	1868	25232
	17 Personal and professional services	666	141	85	42	11	1	43	114	0	4	5	5	16	2155	651	552	1146	0	28679	24123	165528
	18 Maquiladora industries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35759	35759
	Employment	104900	650	4147	2824	1041	34	1043	748	5	346	102	3564	1016	13093	1952	244	8086	211			
	Labor	140829	50	3013	6454	1263	56	2689	2158	14	476	560	6569	4551	6429	6485	4440	17960	1580			
	Value added	70086	16750	12160	3441	26482	44	11752	6411	12	520	291	8720	-827	36262	13508	7720	45739	0			
	Total local inputs	83885	6242	22390	9849	3760	49	5266	8890	95	501	915	26953	611	34984	9183	3385	16479	983			
	Imported inputs	72341	19811	22660	17567	1488	122	13166	5012	62	1511	3778	3226	4426	127019	35725	9687	85350	30676			
	Total Outlays	367141	42904	60222	37311	33010	271	32873	22470	182	3009	5896	45468	8761	204694	64901	25232	165528	35759	696548		

Table E. 1 Inter-regional input-output table, 1988

	INDUSTRY	MERIDA 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	HH
	1 Agriculture	502	0	10410	911	0	0	0	0	0	0	0	0	0	0	0	0	95	0	7763
	2 Mining	0	0	232	0	0	0	52	1617	0	1	0	7105	0	0	0	0	0	0	0
	3 Food products	2316	0	12824	283	1	0	16	0	0	0	0	0	0	0	0	0	2024	0	112406
	4 Textile products	25	1	60	7727	7	8	18	32	1	8	12	0	27	543	176	44	929	0	69163
	5 Wood products	3	0	307	20	1507	16	20	16	0	183	321	10791	47	153	20	746	878	0	25857
	6 Paper products	0	0	480	39	3	1	12	43	1	93	12	0	0	98	0	0	0	0	38774
M	7 Chemical products	94	0	2294	192	170	781	163	303	0	433	21	10951	11	2304	34	92	449	0	13867
E	8 Non-metallic products	1	0	1356	1	6	0	79	6175	2	18	6	61860	11	1	106	3050	1512	0	2060
R	9 Basic metal products	0	0	17	0	4	2	2	295	2942	219	7	29994	3	7	0	0	45	0	0
I	10 Machinery and equipment	308	39	259	38	26	11	19	351	16	223	11	24547	156	182	451	343	369	0	17513
D	11 Other manufacturing	2	0	0	5	0	6	1	0	0	1	5	0	4	28	21	192	332	0	16038
A	12 Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	13 Public utilities	144	134	2095	966	150	213	464	4895	707	279	182	0	765	4080	1500	10931	48050	584	56082
	14 Commerce, hotels and restaurants	3529	647	74929	12607	6084	5188	6713	24774	19596	8980	2472	250834	1854	41322	21942	24416	34260	777	803571
	15 Transportation and communications	789	245	4744	1472	547	638	839	3475	701	886	453	3819	854	58154	23698	7265	39738	1485	797650
	16 Financial services and real estate	793	1945	3660	1779	491	2315	1042	9779	72	1338	435	0	3610	286453	48461	22272	154260	708	1425456
	17 Personal and professional services	477	384	3654	547	125	521	379	3998	69	543	101	0	1114	123510	46361	250729	114760	1963	1639158
	18 Maquiladora industries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Employment	5088	339	10697	10753	1316	1334	1111	2215	329	2424	496	2488	1248	51671	6340	1424	23121	3432	
	Labor	22982	3824	62117	38414	7710	12218	7201	15404	2486	15171	10227	73641	54967	519514	160890	153545	864654	9831	
	Value added	14114	6399	161745	42362	12890	16576	18787	70067	5738	25984	8050	135913	-57859	1325916	535429	1048928	791095	2114	
	1 Agriculture	10205	0	173274	15165	0	0	1	0	0	0	1	0	0	0	0	0	1578	0	129210
	2 Mining	0	0	705	0	0	0	158	4905	0	2	0	21551	0	0	0	0	0	0	0
	3 Food products	544	0	3010	66	0	0	4	0	0	0	0	0	0	0	0	0	475	0	26378
	4 Textile products	8	0	19	2440	2	2	6	10	0	2	4	0	8	172	56	14	293	0	21839
	5 Wood products	1	0	49	3	238	3	3	3	0	29	51	1707	7	24	3	118	139	0	4091
	6 Paper products	0	0	10	1	0	0	0	1	0	2	0	0	0	2	0	0	0	0	849
	7 Chemical products	9	0	210	18	16	72	15	28	0	40	2	1004	1	211	3	8	41	0	1271
R	8 Non-metallic products	0	0	370	0	2	0	21	1684	0	5	2	16870	3	0	29	832	412	0	562
U	9 Basic metal products	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R	10 Machinery and equipment	48	6	40	6	4	2	3	55	0	35	2	3818	24	28	70	53	57	0	2724
A	11 Other manufacturing	0	0	0	1	0	1	0	0	0	0	1	0	1	3	3	23	40	0	1923
L	12 Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	13 Public utilities	30	28	435	201	31	44	96	1017	0	58	38	0	159	847	312	2270	9980	0	9871
	14 Commerce, hotels and restaurants	697	128	14804	2491	1202	1025	1326	4895	0	1774	488	49558	366	8164	4335	4824	6769	0	158764
	15 Transportation and communications	147	45	882	274	102	119	156	646	0	165	84	710	159	10806	4404	1350	7384	0	140393
	16 Financial services and real estate	18	44	84	41	11	53	24	223	0	31	10	0	82	6543	1107	509	3524	0	32560
	17 Personal and professional services	84	68	644	96	22	92	67	705	0	96	18	0	196	21775	8174	44205	20233	0	288991
	18 Maquiladora industries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Employment	0	0	2118	1632	384	389	310	619	92	677	139	2138	385	3504	2362	0	3675	521	
	Labor	0	0	12302	5829	2251	3567	2009	4302	695	4237	2856	63275	16939	35230	59936	0	137433	1342	
	Value added	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total local inputs	20775	3714	311859	47387	10750	11111	11699	69924	24107	15444	4740	495118	9464	565415	161266	374286	448627	5518	
	Imported inputs	8992	3984	189419	57994	23501	20456	26467	52840	19677	27118	10301	41065	138030	375527	289423	1249490	759526	47743	
	Total Outlays	66864	17922	737442	191986	57102	63927	66162	212537	52703	87953	36174	809012	161540	2821602	1206945	2826250	3001335	66547	5844784

	INDUSTRY	RURAL 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	HH	OTHER FD	Total Output
	1 Agriculture	7686	0	2177	331	0	0	0	0	0	0	0	0	0	0	0	0	20	0	14362	22608	66864
	2 Mining	0	0	49	0	0	0	5	435	0	0	0	1254	0	0	0	0	0	0	0	7173	17922
	3 Food products	35486	0	2682	103	0	0	1	0	0	0	0	0	0	0	0	0	433	0	207953	360913	737442
	4 Textile products	390	3	12	2805	1	0	2	9	0	1	2	0	6	117	29	1	199	0	17450	92179	191986
	5 Wood products	48	0	64	7	211	0	2	4	0	31	58	1904	11	33	3	15	188	0	6524	7113	57102
	6 Paper products	0	0	100	14	0	0	1	12	0	16	2	0	0	21	0	0	0	0	9783	14420	63927
M	7 Chemical products	1434	1	480	70	24	21	15	81	0	74	4	1933	3	496	6	2	96	0	3499	25768	66162
E	8 Non-metallic products	19	0	284	0	1	0	7	1660	0	3	1	10916	2	0	17	62	324	0	520	122474	212537
R	9 Basic metal products	3	0	4	0	1	0	0	79	0	37	1	5293	1	2	0	0	10	0	0	13737	52703
I	10 Machinery and equipment	4723	72	54	14	4	0	2	94	0	38	2	4332	36	39	74	7	79	0	4419	29105	87953
D	11 Other manufacturing	25	0	0	2	0	0	0	0	0	0	1	0	1	6	4	4	71	0	4046	15380	36174
A	12 Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	809012	809012
	13 Public utilities	2210	252	438	351	21	6	42	1316	0	47	33	0	176	878	246	223	10284	206	14150	-1560	161540
	14 Commerce, hotels and restaurants	54068	1215	15667	4577	850	138	614	6659	0	1524	444	44264	427	8894	3603	499	7332	274	202747	1123310	2821602
	15 Transportation and communications	12089	460	992	534	76	17	77	934	0	150	81	674	196	12517	3891	148	8505	524	201253	16373	1206945
	16 Financial services and real estate	12145	3654	765	646	69	62	95	2629	0	227	78	0	831	61656	7957	455	33015	250	359653	377191	2826250
	17 Personal and professional services	7314	721	764	198	17	14	35	1075	0	92	18	0	256	26584	7612	5121	24561	692	413572	324293	3001335
	18 Maquiladora industries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66547	66547
	Employment	0	515	0	0	0	0	0	0	0	0	0	0	0	0	0	96	0	68			
	Labor	0	3993	0	0	0	0	0	0	0	0	0	0	0	0	0	1500	0	630			
	Value added	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	745			
	1 Agriculture	156336	0	36231	5505	0	0	0	0	0	0	0	0	0	0	0	0	338	0	239041	346023	1112908
	2 Mining	0	0	147	0	0	0	14	1319	0	0	0	3803	0	0	0	0	0	0	0	21757	54362
	3 Food products	8327	0	629	24	0	0	0	0	0	0	0	0	0	0	0	0	102	0	48801	84696	173057
	4 Textile products	123	1	4	886	0	0	1	3	0	0	1	0	2	37	9	0	63	0	5510	29107	60622
	5 Wood products	8	0	10	1	33	0	0	1	0	5	9	301	2	5	1	2	30	0	1032	1125	9035
	6 Paper products	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	214	316	1399
	7 Chemical products	132	0	44	6	2	2	1	7	0	7	0	177	0	45	1	0	9	0	321	2363	6067
R	8 Non-metallic products	5	0	77	0	0	0	2	453	0	1	0	2977	1	0	5	17	88	0	142	33401	57961
U	9 Basic metal products	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R	10 Machinery and equipment	735	11	8	2	1	0	0	15	0	6	0	674	6	6	12	1	12	0	687	4529	13679
A	11 Other manufacturing	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	9	0	485	1844	4337
L	12 Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	142393	142393
	13 Public utilities	459	52	91	73	4	1	9	273	0	10	7	0	37	182	51	46	2136	0	2491	-2907	28432
	14 Commerce, hotels and restaurants	10682	240	3095	904	168	27	121	1316	0	301	88	8745	84	1757	712	99	1449	0	40057	226015	557472
	15 Transportation and communications	2246	85	184	99	14	3	14	174	0	28	15	125	36	2326	723	28	1580	0	35422	1505	212432
	16 Financial services and real estate	277	83	17	15	2	1	2	60	0	5	2	0	19	1408	182	10	754	0	8215	8639	64557
	17 Personal and professional services	1289	127	135	35	3	2	6	189	0	16	3	0	45	4687	1342	903	4330	0	72915	57655	529149
	18 Maquiladora industries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23461	23461
	Employment	103495	512	6590	7123	687	696	594	1185	0	1296	265	1259	512	26114	1617	349	7560	1326			
	Labor	440667	3970	7677	7206	1425	204	586	7615	0	2704	417	16946	11605	82015	25432	5423	143670	3309			
	Value added	216223	31934	60564	15159	2825	356	1987	17348	0	3752	1218	30827	-17112	272929	112998	24468	126909	0			
	Total local inputs	318263	6979	65208	17203	1502	295	1071	18795	0	2621	851	87373	2178	121700	26480	7645	96015	1945			
	Imported inputs	137756	7486	39607	21054	3283	544	2423	14203	0	4602	1850	7247	31762	80828	47523	25521	162554	16831			
	Total Outlays	1112908	54362	173057	60622	9035	1399	6067	57961	0	13679	4337	142393	28432	557472	212432	64557	529149	23461	1915263		

Table E. 2 Inter-regional input-output table, 1993

		INDUSTRY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
			MERIDA																
	1	Agriculture	430	0	19216	2202	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
	2	Mining	0	0	0	0	0	0	131	7068	0	0	0	7835	0	0	0	0	[illegible]
	3	Food products	3101	0	39352	1161	5	0	42	98	0	16	4	2449	25	11849	3863	10252	[illegible]
	4	Textile products	35	2	349	23692	11	13	35	76	2	16	35	313	38	2409	897	1387	[illegible]
	5	Wood products	0	0	0	0	3516	3	1	0	0	374	1276	31070	0	0	0	0	[illegible]
	6	Paper products	0	0	923	104	7	0	38	74	1	312	60	0	0	0	0	0	[illegible]
M	7	Chemical products	0	0	1490	266	474	2192	523	521	0	1402	65	50744	0	0	0	0	[illegible]
E	8	Non-metallic products	0	0	0	1	0	0	28	17206	0	0	0	256460	0	3	0	0	[illegible]
R	9	Basic metal products	21	0	632	55	4	3	4	294	1993	189	10	43967	12	4644	1512	4013	[illegible]
I	10	Machinery and equipment	245	25	1292	152	27	13	26	483	14	270	20	50816	142	6921	2838	6209	[illegible]
D	11	Other manufacturing	4	1	0	38	0	24	3	0	0	6	39	0	16	0	58	753	[illegible]
A	12	Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
	13	Public utilities	57	268	2821	5262	463	646	1727	18819	1794	981	996	0	1917	0	0	0	[illegible]
	14	Commerce, hotels and restaurants	4095	795	209351	45747	11966	9903	15556	58616	30945	20742	8386	953442	2680	0	6222	0	[illegible]
	15	Transportation and communications	1634	487	20234	8644	1725	1954	3119	13288	1788	3284	2473	18948	2188	165286	99480	4174	[illegible]
	16	Financial services and real estate	1630	3402	18582	9705	1368	6246	3422	33426	190	4415	2091	4186	8340	841396	199406	86935	[illegible]
	17	Personal and professional services	937	583	17669	2869	308	1228	1091	12025	140	1583	428	6115	2281	336356	169464	702687	[illegible]
	18	Maquiladora industries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
		Employment	4521	205	8821	13506	1249	1203	1699	1452	132	1829	622	9628	1862	50364	6664	4686	[illegible]
		Labor	44152	2821	117705	259063	17532	11862	14347	47527	1952	19012	24886	181998	51064	1105613	457262	783332	[illegible]
		Value added	24571	4876	437145	88578	26352	32655	17435	367255	8068	47731	46451	293720	71458	3137791	1521001	3415916	[illegible]
	1	Agriculture	9662	0	432059	49512	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
	2	Mining	0	0	0	0	0	0	327	17569	0	0	0	19474	0	0	0	0	[illegible]
	3	Food products	988	0	12535	370	2	0	14	31	0	5	1	780	8	3774	1231	3266	[illegible]
	4	Textile products	18	1	182	12354	6	7	18	40	1	9	18	163	20	1256	468	723	[illegible]
	5	Wood products	0	0	0	0	752	1	0	0	0	60	273	6641	0	0	0	0	[illegible]
	6	Paper products	0	0	38	4	0	0	2	3	0	13	2	0	0	0	0	0	[illegible]
	7	Chemical products	0	0	161	29	51	237	56	56	0	151	9	5482	0	0	0	0	[illegible]
R	8	Non-metallic products	0	0	0	0	0	0	4	2281	0	0	0	33998	0	0	0	0	[illegible]
U	9	Basic metal products	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	[illegible]
R	10	Machinery and equipment	164	16	866	102	18	9	18	323	9	181	14	34048	95	4637	1902	4160	[illegible]
A	11	Other manufacturing	0	0	0	1	0	1	0	0	0	0	1	0	0	0	1	16	[illegible]
L	12	Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
	13	Public utilities	16	73	769	1435	126	176	471	5130	489	267	272	0	523	0	0	0	[illegible]
	14	Commerce, hotels and restaurants	1013	197	51804	11320	2961	2451	3849	14505	7657	5133	2075	235930	663	0	1540	0	[illegible]
	15	Transportation and communications	173	51	2137	913	182	206	329	1403	189	347	261	2001	231	17457	10507	441	[illegible]
	16	Financial services and real estate	47	99	539	281	40	181	99	969	6	128	61	121	242	24383	5779	2519	[illegible]
	17	Personal and professional services	127	79	2399	390	42	167	148	1633	19	215	58	830	310	45673	23011	95415	[illegible]
	18	Maquiladora industries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
		Employment	0	0	2328	0	563	1274	1768	573	168	1542	722	14634	0	4977	2954	0	[illegible]
		Labor	0	0	31072	0	7904	12554	14930	18753	2493	16037	28920	270961	0	109269	202715	0	[illegible]
		Value added	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
		Total local inputs	24398	6078	835400	176609	24057	25659	31081	205936	45237	40119	18948	1765816	19732	1466046	528177	922950	[illegible]
		Imported inputs	21983	16402	1168291	159658	55170	68075	108042	97753	41275	114387	23962	1227726	191202	1410308	1806186	2438897	[illegible]
		Total Outlays	115104	30176	2589613	683928	131014	150804	185836	737223	99025	237286	143167	3740242	333456	7229027	4515342	7561095	[illegible]

Table E.3 Inter-regional input-output table, 1998

HH	RURAL																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	HH	OTHER FD	Total Output
17676	9662	0	5655	749	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31516	27995	115104
0	0	0	0	0	0	0	17	1676	0	0	0	46	0	0	0	0	0	0	0	13402	30176
319009	69711	0	11581	395	1	0	6	23	0	11	0	14	7	2281	467	265	3067	0	568744	1519036	2589613
181279	794	2	103	8062	2	1	5	18	0	11	1	2	10	464	108	36	551	0	44077	415000	683928
74784	0	0	0	0	766	0	0	0	0	257	54	183	0	0	0	0	0	0	18183	545	131014
115304	0	0	272	35	1	0	5	18	0	214	3	0	0	0	0	0	0	0	28036	5397	150804
41407	0	0	439	91	103	136	69	123	0	963	4	299	0	0	0	0	0	0	10068	74437	185836
7017	0	0	0	0	0	0	4	4079	0	0	0	1509	0	1	0	0	0	0	1706	449209	737223
0	478	0	186	19	1	0	1	70	0	130	0	259	3	894	183	104	967	0	0	31194	99025
36726	5505	38	380	52	6	1	4	114	0	186	1	299	39	1332	343	161	1455	0	8930	101413	237286
53333	88	1	0	13	0	2	0	0	0	4	2	0	4	0	7	19	187	0	12968	74206	143167
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3740242	3740242
157070	1286	411	830	1791	101	40	229	4462	0	674	42	0	521	0	0	0	12576	7040	38191	-25531	333456
2338075	92071	1220	61612	15566	2608	614	2060	13898	1	14251	356	5611	729	0	752	0	0	9362	568494	2717228	7229027
2571427	36728	747	5955	2941	376	121	413	3151	0	2256	105	112	595	31814	12026	108	14941	17900	625233	717112	4515342
4294490	36655	5222	5469	3302	298	387	453	7925	0	3034	89	25	2268	161950	24105	2251	72665	8538	1044190	117799	7561095
5145172	21077	895	5200	976	67	76	144	2851	0	1088	18	36	620	64741	20485	18194	50268	23666	1251030	1361477	9812548
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	395788	395788
	0	253	0	0	0	0	0	0	0	0	0	0	586	0	0	1108	0	503			
	0	2575	0	0	0	0	0	0	0	0	0	0	6574	0	0	36780	0	8759			
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38743			
397456	217247	0	127155	16847	0	0	0	0	0	0	0	0	0	0	0	0	0	0	708607	629423	2587972
0	0	0	0	0	0	0	43	4166	0	0	0	115	0	0	0	0	0	0	0	33312	75005
101617	22206	0	3689	126	0	0	2	7	0	4	0	5	2	726	149	85	977	0	181167	483871	824891
94528	414	1	54	4204	1	0	2	9	0	6	1	1	5	242	57	19	287	0	22984	216401	356633
15984	0	0	0	0	164	0	0	0	0	55	12	39	0	0	0	0	0	0	3886	116	28002
4784	0	0	11	1	0	0	0	1	0	9	0	0	0	0	0	0	0	0	1163	224	6257
4474	0	0	47	10	11	15	7	13	0	104	0	32	0	0	0	0	0	0	1086	8042	20077
930	0	0	0	0	0	0	0	541	0	0	0	200	0	0	0	0	0	0	226	59550	97732
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	9
24607	3686	25	255	35	4	1	2	77	0	124	1	200	26	893	230	108	975	0	5963	67949	158986
1101	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	268	1532	2956
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25378	25378
42821	351	112	226	488	28	11	62	1216	0	184	12	0	142	0	0	0	3428	0	10412	-3796	90907
578559	22783	302	15246	3852	645	152	510	3439	0	3526	86	1386	180	0	186	0	0	0	140675	676201	1788831
271586	3879	79	629	311	40	13	44	333	0	238	11	12	63	3360	1270	11	1578	0	66035	78856	476897
124452	1062	151	158	96	9	11	13	230	0	88	3	1	66	4693	699	65	2106	0	30260	3822	219117
698644	2862	122	706	133	9	10	20	387	0	148	2	5	84	8791	2782	2470	6826	0	169673	190168	1305252
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	610068	610068
	101649	708	9000	17581	1041	272	414	1292	1	806	76	132	1360	28781	3055	180	8879	9140			
	992699	7200	60914	132904	4208	1350	4196	13213	0	6049	178	3805	15247	226163	23909	5965	315749	55287			
	508310	30729	174292	79535	6525	444	1652	12516	5	46780	959	3957	15443	1009034	170781	89328	438220	0			
	548549	9330	245858	60094	5244	1591	4116	48826	2	27565	803	10392	5366	282182	63848	23897	172858	66506			
	538414	25171	343827	84100	12026	2871	10111	23177	2	78592	1016	7225	48277	271453	218359	63147	378425	440773			
17714316	2587972	75005	824891	356633	28002	6257	20077	97732	9	158986	2956	25378	90907	1788831	476897	219117	1305252	610068	5593995		

MERIDA	OUTPUT	Intra-regional	Inter-regional	Pct Local
Agriculture	1.839	1.594	0.245	70.8%
Mining	1.424	1.344	0.080	81.2%
Food products	1.892	1.520	0.372	58.3%
Textile products	1.627	1.451	0.175	72.0%
Wood products	1.940	1.711	0.229	75.6%
Paper products	1.444	1.348	0.097	78.3%
Chemical products	1.412	1.329	0.082	80.0%
Non-metallic products	1.600	1.447	0.153	74.5%
Basic metal products	1.780	1.641	0.139	82.1%
Machinery and equipment	1.382	1.303	0.079	79.4%
Other manufacturing	1.381	1.300	0.080	78.9%
Construction	2.099	1.819	0.280	74.5%
Public utilities	1.948	1.736	0.211	77.7%
Commerce, hotels and restaurants	1.308	1.249	0.060	80.6%
Transportation and communications	1.335	1.263	0.073	78.3%
Financial services and real estate	1.385	1.301	0.083	78.4%
Personal and professional services	1.492	1.387	0.105	78.8%
Maquiladora industries	1.247	1.203	0.044	82.2%

Table E.4 Type II output multipliers for Mérida (1988)

RURAL	OUTPUT	Intra-regional	Inter-regional	Pct Local
Agriculture	1.997	1.361	0.637	36.2%
Mining	1.209	1.032	0.177	15.2%
Food products	1.721	1.342	0.378	47.5%
Textile products	1.692	1.223	0.469	32.2%
Wood products	1.214	1.058	0.156	27.2%
Paper products	1.574	1.146	0.428	25.4%
Chemical products	1.349	1.082	0.267	23.4%
Non-metallic products	1.714	1.194	0.520	27.2%
Basic metal products	1.830	1.150	0.680	18.1%
Machinery and equipment	1.476	1.117	0.359	24.7%
Other manufacturing	1.449	1.109	0.341	24.2%
Construction	2.040	1.278	0.763	26.7%
Public utilities	1.923	1.270	0.654	29.2%
Commerce, hotels and restaurants	1.291	1.060	0.231	20.6%
Transportation and communications	1.356	1.084	0.271	23.7%
Financial services and real estate	1.474	1.126	0.348	26.6%
Personal and professional services	1.321	1.082	0.239	25.6%
Maquiladora industries	1.119	1.026	0.093	21.9%

Table E.5 Type II output multipliers for rural areas (1988)

MERIDA	INCOME	Intra-regional	Inter-regional	Pct Local
Agriculture	1.373	0.323	0.050	86.7%
Mining	1.356	0.328	0.029	91.9%
Food products	1.993	0.581	0.412	58.5%
Textile products	1.510	0.384	0.126	75.3%
Wood products	1.500	0.448	0.052	89.7%
Paper products	1.448	0.264	0.184	59.0%
Chemical products	1.504	0.448	0.056	88.9%
Non-metallic products	1.778	0.572	0.206	73.5%
Basic metal products	1.821	0.517	0.305	62.9%
Machinery and equipment	1.494	0.319	0.175	64.5%
Other manufacturing	1.352	0.322	0.029	91.7%
Construction	1.675	0.429	0.246	63.6%
Public utilities	1.252	0.202	0.049	80.3%
Commerce, hotels and restaurants	1.795	0.665	0.130	83.6%
Transportation and communications	1.438	0.274	0.164	62.5%
Financial services and real estate	1.467	0.387	0.081	82.7%
Personal and professional services	1.388	0.328	0.060	84.6%
Maquiladora industries	1.359	0.281	0.078	78.3%

Table E.6 Type II income multipliers for Mérida (1988)

RURAL	INCOME	Intra-regional	Inter-regional	Pct Local
Agriculture	1.497	0.429	0.068	86.3%
Mining	14.804	3.909	9.895	28.3%
Food products	4.109	2.476	0.633	79.6%
Textile products	1.733	0.590	0.143	80.4%
Wood products	1.660	0.492	0.168	74.6%
Paper products	1.426	0.353	0.073	82.9%
Chemical products	1.604	0.465	0.140	76.8%
Non-metallic products	2.101	0.722	0.378	65.6%
Basic metal products	2.195	0.753	0.442	63.0%
Machinery and equipment	1.437	0.360	0.077	82.5%
Other manufacturing	1.426	0.233	0.193	54.7%
Construction	1.753	0.549	0.204	72.9%
Public utilities	1.319	0.279	0.040	87.4%
Commerce, hotels and restaurants	2.326	0.811	0.515	61.2%
Transportation and communications	1.562	0.439	0.123	78.1%
Financial services and real estate	1.481	0.387	0.094	80.5%
Personal and professional services	1.540	0.426	0.114	79.0%
Maquiladora industries	1.421	0.308	0.114	73.0%

Table E.7 Type II income multipliers for rural areas (1988)

MERIDA	EMPLOY	Intra-regional	Inter-regional	Pct Local
Agriculture	1.096	1.027	0.069	28.3%
Mining	1.003	1.002	0.002	50.6%
Food products	4.599	1.608	2.991	16.9%
Textile products	3.220	1.650	1.570	29.3%
Wood products	1.223	1.125	0.098	55.9%
Paper products	1.514	1.228	0.286	44.4%
Chemical products	1.382	1.209	0.172	54.9%
Non-metallic products	2.329	1.669	0.661	50.3%
Basic metal products	5.146	3.287	1.858	55.2%
Machinery and equipment	1.201	1.099	0.102	49.2%
Other manufacturing	2.745	1.917	0.828	52.6%
Construction	2.107	1.581	0.526	52.5%
Public utilities	1.771	1.330	0.440	42.9%
Commerce, hotels and restaurants	1.416	1.230	0.186	55.3%
Transportation and communications	1.987	1.437	0.550	44.3%
Financial services and real estate	7.448	4.344	3.104	51.9%
Personal and professional services	1.628	1.310	0.318	49.4%
Maquiladora industries	1.139	1.069	0.070	49.6%

Table E.8 Type II employment multipliers for Mérida (1988)

RURAL	EMPLOY	Intra-regional	Inter-regional	Pct Local
Agriculture	1.320	1.254	0.067	79.2%
Mining	1.172	1.072	0.100	41.9%
Food products	2.350	2.159	0.190	85.9%
Textile products	1.736	1.561	0.175	76.2%
Wood products	1.309	1.170	0.140	54.9%
Paper products	1.249	1.164	0.085	65.8%
Chemical products	1.526	1.309	0.216	58.9%
Non-metallic products	1.907	1.499	0.408	55.0%
Basic metal products	2.168	1.543	0.625	46.5%
Machinery and equipment	1.222	1.141	0.081	63.5%
Other manufacturing	1.771	1.455	0.316	59.0%
Construction	1.559	1.295	0.264	52.7%
Public utilities	1.548	1.395	0.152	72.2%
Commerce, hotels and restaurants	1.172	1.088	0.084	51.0%
Transportation and communications	1.582	1.361	0.221	62.1%
Financial services and real estate	3.903	2.856	1.046	64.0%
Personal and professional services	1.375	1.238	0.137	63.4%
Maquiladora industries	1.270	1.171	0.099	63.3%

Table E.9 Type II employment multipliers for rural areas (1988)

MERIDA	OUTPUT	Intra-regional	Inter-regional	Pct Local
Agriculture	2.163	0.810	0.353	69.6%
Mining	1.646	0.561	0.086	86.7%
Food products	2.007	0.592	0.415	58.8%
Textile products	1.831	0.604	0.227	72.7%
Wood products	1.582	0.488	0.095	83.8%
Paper products	1.670	0.563	0.107	84.1%
Chemical products	1.507	0.423	0.083	83.6%
Non-metallic products	1.672	0.549	0.123	81.7%
Basic metal products	1.851	0.796	0.054	93.6%
Machinery and equipment	1.637	0.534	0.103	83.8%
Other manufacturing	1.795	0.661	0.133	83.2%
Construction	2.274	1.046	0.228	82.1%
Public utilities	1.814	0.675	0.139	83.0%
Commerce, hotels and restaurants	1.614	0.530	0.083	86.4%
Transportation and communications	1.506	0.426	0.081	84.1%
Financial services and real estate	1.315	0.267	0.048	84.7%
Personal and professional services	1.775	0.653	0.121	84.3%
Maquiladora industries	1.406	0.353	0.053	86.9%

Table E.10 Type II output multipliers for Mérida (1993)

RURAL	OUTPUT	Intra-regional	Inter-regional	Pct Local
Agriculture	2.244	0.411	0.833	33.0%
Mining	1.432	0.069	0.363	15.9%
Food products	1.828	0.364	0.465	43.9%
Textile products	1.732	0.239	0.493	32.6%
Wood products	1.534	0.105	0.429	19.6%
Paper products	1.576	0.104	0.472	18.1%
Chemical products	1.446	0.084	0.362	18.8%
Non-metallic products	1.740	0.150	0.590	20.2%
Basic metal products	0.000	0.000	0.000	0.0%
Machinery and equipment	1.643	0.126	0.517	19.6%
Other manufacturing	1.475	0.086	0.389	18.1%
Construction	2.201	0.223	0.978	18.6%
Public utilities	1.817	0.183	0.634	22.4%
Commerce, hotels and restaurants	1.577	0.096	0.481	16.7%
Transportation and communications	1.399	0.075	0.325	18.7%
Financial services and real estate	1.386	0.072	0.314	18.6%
Personal and professional services	1.752	0.150	0.601	20.0%
Maquiladora industries	1.420	0.073	0.347	17.4%

Table E.11 Type II output multipliers for rural areas (1993)

MERIDA	INCOME	Intra-regional	Inter-regional	Pct Local
Agriculture	1.791	0.618	0.173	78.2%
Mining	1.573	0.516	0.057	90.0%
Food products	3.571	1.330	1.241	51.7%
Textile products	1.826	0.601	0.225	72.7%
Wood products	1.666	0.499	0.167	74.9%
Paper products	1.539	0.404	0.135	75.0%
Chemical products	1.732	0.552	0.180	75.4%
Non-metallic products	2.423	1.056	0.366	74.3%
Basic metal products	3.706	2.191	0.515	81.0%
Machinery and equipment	1.581	0.439	0.142	75.5%
Other manufacturing	1.452	0.341	0.111	75.4%
Construction	2.390	0.895	0.495	64.4%
Public utilities	1.381	0.283	0.099	74.1%
Commerce, hotels and restaurants	1.603	0.516	0.087	85.5%
Transportation and communications	1.573	0.411	0.162	71.7%
Financial services and real estate	2.426	1.196	0.231	83.8%
Personal and professional services	1.490	0.396	0.094	80.8%
Maquiladora industries	1.526	0.435	0.092	82.6%

Table E.12 Type II income multipliers for Mérida (1993)

RURAL	INCOME	Intra-regional	Inter-regional	Pct Local
Agriculture	1.740	0.591	0.149	79.9%
Mining	1.570	0.246	0.324	43.2%
Food products	5.896	3.401	1.495	69.5%
Textile products	2.460	1.030	0.430	70.6%
Wood products	1.690	0.504	0.186	73.0%
Paper products	1.778	0.548	0.230	70.5%
Chemical products	1.935	0.626	0.309	67.0%
Non-metallic products	2.126	0.721	0.405	64.0%
Basic metal products	0.000	0.000	0.000	0.0%
Machinery and equipment	1.665	0.490	0.176	73.6%
Other manufacturing	1.994	0.655	0.339	65.9%
Construction	2.854	0.995	0.858	53.7%
Public utilities	1.429	0.351	0.078	81.9%
Commerce, hotels and restaurants	1.763	0.542	0.221	71.1%
Transportation and communications	1.700	0.511	0.189	73.0%
Financial services and real estate	1.861	0.490	0.370	57.0%
Personal and professional services	1.600	0.457	0.143	76.2%
Maquiladora industries	1.556	0.367	0.189	66.0%

Table E.13 Type II income multipliers for rural areas (1993)

MERIDA	EMPLOY	Intra-regional	Inter-regional	Pct Local
Agriculture	1.456	0.123	0.333	27.0%
Mining	1.423	0.246	0.176	58.3%
Food products	3.381	0.476	1.905	20.0%
Textile products	1.395	0.143	0.252	36.1%
Wood products	1.359	0.208	0.152	57.8%
Paper products	1.406	0.221	0.184	54.6%
Chemical products	1.399	0.227	0.171	57.0%
Non-metallic products	1.793	0.460	0.333	58.0%
Basic metal products	2.676	1.387	0.288	82.8%
Machinery and equipment	1.309	0.173	0.136	56.0%
Other manufacturing	1.765	0.404	0.360	52.9%
Construction	5.283	2.565	1.719	59.9%
Public utilities	2.301	0.640	0.661	49.2%
Commerce, hotels and restaurants	1.377	0.214	0.164	56.7%
Transportation and communications	2.020	0.533	0.487	52.3%
Financial services and real estate	9.080	4.900	3.179	60.6%
Personal and professional services	2.242	0.657	0.585	52.9%
Maquiladora industries	1.096	0.056	0.041	57.7%

Table E.14 Type II employment multipliers for Mérida (1993)

RURAL	EMPLOY	Intra-regional	Inter-regional	Pct Local
Agriculture	1.436	0.326	0.109	74.9%
Mining	1.345	0.178	0.167	51.5%
Food products	1.954	0.774	0.179	81.2%
Textile products	1.232	0.157	0.075	67.7%
Wood products	1.153	0.078	0.074	51.2%
Paper products	1.022	0.011	0.011	51.1%
Chemical products	1.089	0.044	0.045	49.1%
Non-metallic products	1.647	0.320	0.327	49.4%
Basic metal products	0.000	0.000	0.000	0.0%
Machinery and equipment	1.141	0.074	0.066	52.9%
Other manufacturing	1.154	0.073	0.081	47.5%
Construction	3.723	1.126	1.596	41.4%
Public utilities	1.985	0.620	0.366	62.9%
Commerce, hotels and restaurants	1.187	0.104	0.083	55.7%
Transportation and communications	1.909	0.511	0.398	56.2%
Financial services and real estate	1.931	0.487	0.444	52.3%
Personal and professional services	1.981	0.582	0.399	59.3%
Maquiladora industries	1.131	0.073	0.058	55.5%

Table E.15 Type II employment multipliers for rural areas (1993)

MERIDA	OUTPUT	Intra-regional	Inter-regional	Pct Local
Agriculture	1.945	1.715	0.230	75.7%
Mining	1.427	1.378	0.049	88.5%
Food products	1.658	1.386	0.272	58.6%
Textile products	2.020	1.783	0.237	76.8%
Wood products	1.575	1.479	0.096	83.3%
Paper products	1.501	1.420	0.081	83.8%
Chemical products	1.492	1.406	0.086	82.6%
Non-metallic products	1.547	1.446	0.102	81.4%
Basic metal products	1.764	1.635	0.129	83.1%
Machinery and equipment	1.481	1.400	0.081	83.2%
Other manufacturing	1.780	1.638	0.142	81.8%
Construction	1.912	1.748	0.164	82.0%
Public utilities	1.317	1.274	0.043	86.4%
Commerce, hotels and restaurants	1.548	1.482	0.065	88.1%
Transportation and communications	1.397	1.340	0.057	85.7%
Financial services and real estate	1.353	1.305	0.048	86.4%
Personal and professional services	1.646	1.550	0.096	85.2%
Maquiladora industries	1.324	1.289	0.034	89.4%

Table E.16 Type II output multipliers for Mérida (1998)

RURAL	OUTPUT	Intra-regional	Inter-regional	Pct Local
Agriculture	1.971	1.288	0.683	29.6%
Mining	1.380	1.061	0.320	15.9%
Food products	1.644	1.266	0.378	41.3%
Textile products	1.881	1.238	0.643	27.0%
Wood products	1.520	1.101	0.419	19.4%
Paper products	1.716	1.130	0.586	18.1%
Chemical products	1.635	1.125	0.509	19.7%
Non-metallic products	1.946	1.190	0.756	20.0%
Basic metal products	1.309	1.051	0.258	16.6%
Machinery and equipment	1.319	1.054	0.265	16.8%
Other manufacturing	1.498	1.084	0.414	16.8%
Construction	1.865	1.165	0.700	19.1%
Public utilities	1.460	1.087	0.372	19.0%
Commerce, hotels and restaurants	1.427	1.067	0.360	15.8%
Transportation and communications	1.277	1.039	0.237	14.2%
Financial services and real estate	1.473	1.069	0.404	14.7%
Personal and professional services	1.577	1.111	0.466	19.2%
Maquiladora industries	1.328	1.044	0.284	13.4%

Table E.17 Type II output multipliers for rural areas (1998)

MERIDA	INCOME	Intra-regional	Inter-regional	Pct Local
Agriculture	1.506	0.431	0.075	85.1%
Mining	1.780	0.696	0.085	89.1%
Food products	3.730	1.317	1.413	48.2%
Textile products	1.577	0.491	0.086	85.0%
Wood products	1.544	0.373	0.171	68.6%
Paper products	1.561	0.311	0.250	55.4%
Chemical products	1.569	0.318	0.251	55.9%
Non-metallic products	2.030	0.732	0.299	71.0%
Basic metal products	3.845	1.860	0.985	65.4%
Machinery and equipment	1.590	0.351	0.240	59.4%
Other manufacturing	1.395	0.203	0.191	51.5%
Construction	2.243	0.696	0.547	56.0%
Public utilities	1.386	0.355	0.031	92.0%
Commerce, hotels and restaurants	1.595	0.500	0.095	84.0%
Transportation and communications	1.521	0.360	0.161	69.1%
Financial services and real estate	1.743	0.647	0.096	87.1%
Personal and professional services	1.422	0.317	0.105	75.1%
Maquiladora industries	1.603	0.443	0.161	73.4%

Table E.18 Type II income multipliers for Mérida (1998)

RURAL	INCOME	Intra-regional	Inter-regional	Pct Local
Agriculture	1.531	0.441	0.090	83.1%
Mining	1.528	0.313	0.214	59.4%
Food products	3.066	1.552	0.514	75.1%
Textile products	1.506	0.415	0.091	81.9%
Wood products	1.637	0.478	0.159	75.0%
Paper products	1.604	0.457	0.147	75.6%
Chemical products	1.561	0.431	0.129	76.9%
Non-metallic products	2.186	0.747	0.439	63.0%
Basic metal products	0.000	0.000	0.000	0.0%
Machinery and equipment	2.454	0.853	0.601	58.7%
Other manufacturing	2.439	0.849	0.590	59.0%
Construction	1.973	0.655	0.319	67.3%
Public utilities	1.369	0.225	0.144	61.0%
Commerce, hotels and restaurants	1.627	0.467	0.161	74.4%
Transportation and communications	2.051	0.683	0.368	65.0%
Financial services and real estate	1.511	0.102	0.409	19.9%
Personal and professional services	1.466	0.374	0.092	80.2%
Maquiladora industries	1.618	0.406	0.212	65.7%

Table E.19 Type II income multipliers for rural areas (1998)

MERIDA	EMPLOY	Intra-regional	Inter-regional	Pct Local
Agriculture	1.233	1.073	0.160	31.5%
Mining	1.281	1.165	0.116	58.7%
Food products	3.576	1.475	2.101	18.4%
Textile products	1.534	1.192	0.342	35.9%
Wood products	1.317	1.173	0.144	54.6%
Paper products	1.216	1.114	0.102	52.9%
Chemical products	1.189	1.096	0.093	50.8%
Non-metallic products	2.283	1.663	0.619	51.7%
Basic metal products	2.879	2.138	0.741	60.5%
Machinery and equipment	1.244	1.130	0.113	53.6%
Other manufacturing	1.622	1.282	0.340	45.3%
Construction	2.067	1.622	0.445	58.3%
Public utilities	1.307	1.170	0.138	55.3%
Commerce, hotels and restaurants	1.325	1.180	0.145	55.4%
Transportation and communications	2.019	1.513	0.506	50.3%
Financial services and real estate	3.967	2.745	1.222	58.8%
Personal and professional services	2.000	1.497	0.502	49.7%
Maquiladora industries	1.111	1.066	0.045	59.3%

Table E.20 Type II employment multipliers for Mérida (1998)

RURAL	EMPLOY	Intra-regional	Inter-regional	Pct Local
Agriculture	1.289	1.215	0.074	74.4%
Mining	1.184	1.103	0.081	56.1%
Food products	1.989	1.806	0.182	81.6%
Textile products	1.205	1.143	0.062	69.5%
Wood products	1.123	1.063	0.060	51.3%
Paper products	1.129	1.067	0.062	52.0%
Chemical products	1.247	1.136	0.110	55.3%
Non-metallic products	1.499	1.261	0.238	52.3%
Basic metal products	1.020	1.007	0.012	37.3%
Machinery and equipment	1.470	1.200	0.270	42.6%
Other manufacturing	1.146	1.065	0.081	44.7%
Construction	2.335	1.615	0.719	46.1%
Public utilities	1.160	1.097	0.064	60.2%
Commerce, hotels and restaurants	1.159	1.093	0.066	58.5%
Transportation and communications	1.227	1.118	0.110	51.8%
Financial services and real estate	1.458	1.212	0.246	46.2%
Personal and professional services	1.632	1.393	0.239	62.2%
Maquiladora industries	1.134	1.068	0.066	50.7%

Table E.21 Type II employment multipliers for rural areas (1998)

APPENDIX F

TRADITIONAL ECONOMIC BASE MULTIPLIERS

MUNICIPIO	**Multiplier**
ABALA	1.3014
ACANCEH	1.6387
AKIL	1.2982
BACA	1.5643
BOKOBA	1.2290
BUCTZOTZ	1.2283
CACALCHEN	2.0715
CALOTMUL	1.1415
CANSAHCAB	2.1217
CANTAMAYEC	1.1826
CELESTUN	1.1584
CENOTILLO	1.1630
CONKAL	1.5589
CUNCUNUL	1.1708
CUZAMA	1.4581
CHACSINKIN	1.1795
CHANKOM	1.0674
CHAPAB	1.2082
CHEMAX	1.1373
CHICXULUB PUEBLO	2.0495
CHICHIMILA	1.1466
CHIKINDZONOT	1.0873
CHOCHOLA	2.9489
CHUMAYEL	1.3551
DZAN	1.1780
DZEMUL	1.6790
DZIDZANTUN	1.3160
DZILAM DE BRAVO	1.2082
DZILAM GONZALEZ	1.1818
DZITAS	1.2431
DZONCAUICH	1.1413
ESPITA	1.1561
HALACHO	1.8670
HOCABA	1.8221
HOCTUN	1.7823
HOMUN	1.9384
HUHI	3.4467
HUNUCMA	2.6604
IXIL	1.3278
IZAMAL	1.8225
KANASIN	1.2458
KANTUNIL	1.2134
KAUA	1.2207
KINCHIL	1.1950
KOPOMA	1.3736
MAMA	1.3056
MANI	1.2325
MAXCANU	1.7081
MAYAPAN	1.2001
MERIDA	1.6299
MOCOCHA	2.0005
MOTUL	1.3006
MUNA	1.3108
MUXUPIP	1.4150

OPICHEN	1.1946
OXKUTZCAB	1.3496
PANABA	1.1813
PETO	1.6180
PROGRESO	1.2297
QUINTANA ROO	1.1468
RIO LAGARTOS	1.2600
SACALUM	1.2660
SAMAHIL	1.1505
SANAHCAT	1.3803
SAN FELIPE	1.1472
SANTA ELENA	1.3041
SEYE	2.2730
SINANCHE	1.2102
SOTUTA	1.2997
SUCILA	1.2223
SUDZAL	1.1359
SUMA	1.5021
TAHDZIU	1.1488
TAHMEK	1.5148
TEABO	1.4348
TECOH	2.5223
TEKAL DE VENEGAS	1.1536
TEKANTO	1.4637
TEKAX	3.0948
TEKIT	1.1790
TEKOM	1.2176
TELCHAC	1.5283
TELCHAC PUERTO	1.2432
TEMAX	1.5951
TEMOZON	1.1331
TEPAKAN	1.5967
TETIZ	1.1944
TEYA	1.2341
TICUL	1.2186
TIMUCUY	2.2259
TINUM	1.1733
TIXCACALCUPUL	1.0969
TIXKOKOB	1.4718
TIXMEHUAC	1.1227
TIXPEHUAL	1.7617
TIZIMIN	1.3837
TUNKAS	1.1374
TZUCACAB	1.2189
UAYMA	1.1630
UCU	1.3879
UMAN	1.3157
VALLADOLID	1.4130
XOCCHEL	1.4638
YAXCABA	1.0852
YAXKUKUL	1.8624
YOBAIN	1.1730

Table F.1 Traditional economic base multipliers, 1998

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