

ECONOMIC DEVELOPMENT  
AND  
FACTORS AFFECTING  
INDUSTRIAL LOCATION  
ON THE  
TEXAS GULF COAST

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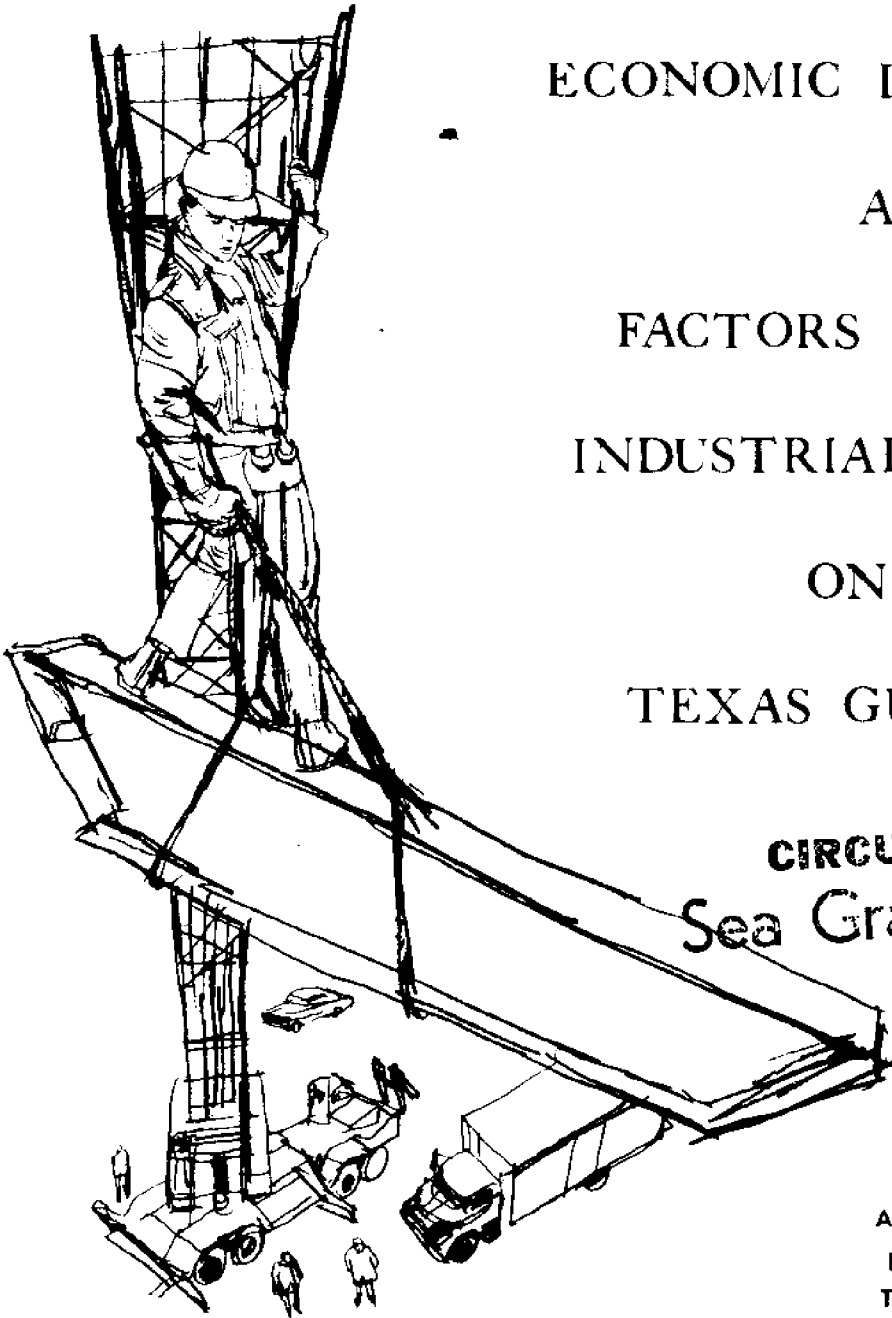
PREPARED BY

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TEXAS A & M UNIVERSITY  
JUNE 1971



SEA GRANT PROGRAM  
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## FOREWORD

This report examines the major economic characteristics of five regions within the 36-county Texas Gulf Coast Area to determine the influence of major factors which affect the location decisions of firms recently settling within the area. Also, the resources and industrial activities of the Texas Gulf Coast Region are considered in the light of modern economic development theory to facilitate an understanding of the current expansion and to help anticipate the direction and magnitude of future adjustments. This study will be useful to industries seeking areas which meet their requirements in terms of markets, materials, labor, land, transportation facilities and other criteria. It will also be helpful to local governments in identifying the location criteria used by specific industries and to indicate which types of industries they are most likely to attract.

The Industrial Economics Research Division is grateful for the assistance of all the firms and individuals who provided information and other assistance in the development of the study. The authors are especially indebted to John Miloy of the Industrial Economics Research Division for his suggestions, comments and editorial assistance.

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James R. Bradley, Head  
Industrial Economics  
Research Division

June 1971

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## SUMMARY

This study examines the current strengths and activities of the five state planning regions in the Texas Gulf Coast Area and suggests the future types of economic development likely to occur in the different regions.

Seventy-five percent of the firms surveyed was associated with the petroleum, chemical, aluminum, and machine tool industries. These firms considered location factors to be: proximity to raw materials, suitable transportation network, proximity to product markets, skilled labor supply, and land availability.

The share of the total state's economic activity for the 36-county study area increased from 35.78 to 37.96 percent between 1964 and 1969. The Gulf Coast Region, which includes the Houston-Galveston area, accounted for approximately 25 percent of the state's total and approximately 66 percent of the study area's total economic activity.

There was approximately a 30 percent increase in employment in the study area between 1964 and 1969. With the exception of the Gulf Coast Region, primary activities in the remaining four regions either decreased or increased at a smaller rate than their secondary and tertiary economic activities.

The Gulf Coast Region of the study area is the largest and most rapidly growing Region while the Southeast Texas Region experienced the lowest growth rate. The Golden Crescent Region is making the largest relative shift away from primary activities into secondary and tertiary activities.

Retirement living is becoming increasingly important to the study area as indicated by the 44 percent increase in the number of people over 64 years of age during the five-year interval while the total population of the area increased only 19 percent.

The relative importance of the secondary and tertiary activities for all regions seem likely to expand due to the rising expenditures for tourism, recreation, and retirement living.

## INTRODUCTION

"The United States has come to appreciate the esthetic as well as the economic values of its precious natural coastline. Forty-five percent of the Nation's population is concentrated in coastal counties. Future burgeoning megalopoli will further crowd the coast and intensified use will generate conflict between those who wish to transport bulk cargoes of ore, fuel, and chemicals through the Nation's marine gateways, those who wish to live, swim, fish, and sail along the coast, and those who seek to dump municipal and industrial waste into convenient estuarine sinks."<sup>1</sup>

The people of the United States, as indicated by the above quotation, are becoming increasingly cognizant of the importance and potential of the country's marine resources and activities. This increased awareness is causing many government and business leaders to devote additional attention to the development of our marine resources. In 1966 Congress devised its first marine resource program when it created the National Sea Grant College and Program Act which was to encourage the development of the nation's marine resources, augment the skilled manpower and equipment needed to utilize these untapped resources, and to provide greater economic opportunities and technical means for marine resource development.

The State of Texas has more than 1,000 miles of coastal shoreline and a vital interest in the development of the marine resources in the Texas Gulf Coast Region. The Sea Grant Program within the Center for

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<sup>1</sup>Marine Science Affairs, Annual Report of the President to the Congress on Marine Resources and Engineering Development, U. S. Government Printing Office, April 1970, p. 7.



Marine Resources at Texas A&M University is assisting the National program to increase economic activity in the industries associated with marine resources on the Texas Gulf Coast.

Before policies to stimulate regional economic development can be implemented, there must be an evaluation of the area's resources, characteristics, and future potential. By analyzing the factors affecting industrial location along the Gulf Coast Area and assessing the influence of the marine-related activities on industrial location, this project will simultaneously help fulfill the objective of the Sea Grant Program and assist the process of economic development. With analysis of the area's future potential and advanced planning, the Texas Gulf Coast Region can reap the maximum benefits from marine resources in the decades ahead.

#### OBJECTIVES

The objective of this study is to determine the relative importance of various factors affecting industrial location along the Gulf Coast Region and to assess the influence of marine-related activities on the industries locating in this area. This study will place in perspective the marine segment of the Texas Gulf Coast economy and form a basis upon which further studies of the Gulf Coast marine industrial base can be accomplished.

## STUDY AREA

In 1966 the Division of Planning Coordination for the State of Texas began a study of governmental structure in Texas in an attempt to create regions based on functional economic unity rather than on political boundaries. The need for coordinated planning and improved communication among local, state, and federal government bodies is being presently met by 21 state planning regions. The major criteria for selecting these regions were:

1. Each region must have a commonality of public and private interests, resources, problems, and opportunities, and must be potentially capable of benefiting from coordinative efforts on behalf of the entire region.
2. Each region must, to as great an extent as possible, meet the requirements set forth by the U. S. Public Health Service for comprehensive area-wide health planning districts.
3. Each region must represent an identifiable and feasible unit for planning and for program development.
4. Each region must have as its focal point a major urban center.
5. Urban centers, when feasible, must include the central cities of Texas' Standard Metropolitan Statistical Areas.
6. Urban centers which are not part of a Standard Metropolitan Statistical Area must meet minimum size, locational, and service requirements.
7. The county will represent the basic unit within a designated multi-county planning region.
8. Each county in the State shall be included within a designated regional area.<sup>2</sup>

The counties were included in a region according to geographic, social, and economic characteristics. A Regional Council of Governments was

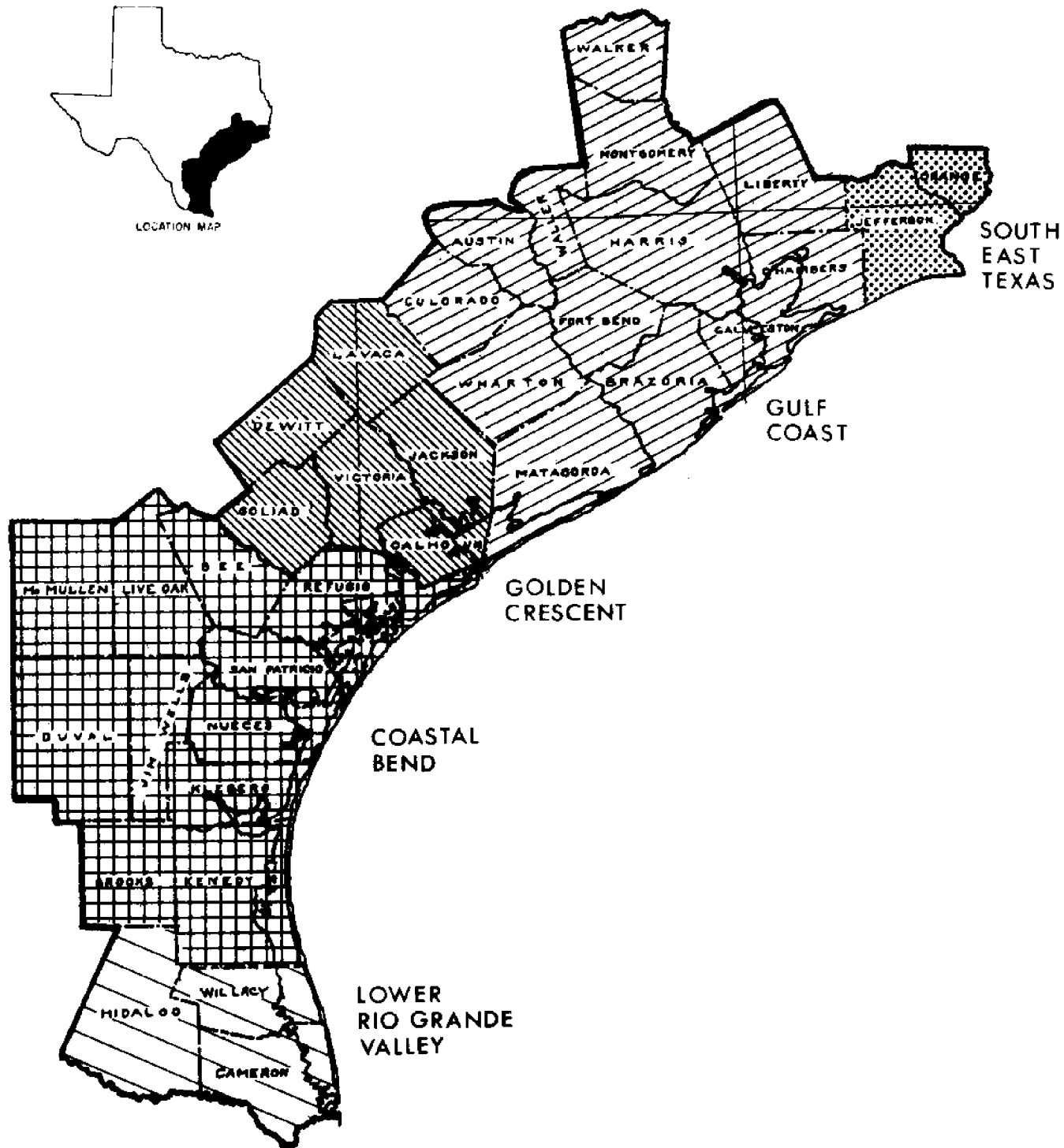
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<sup>2</sup>Planning Region for the State of Texas, Division of Planning Coordination, Austin, Office of the Governor, December 1968, p. ii.

established in each planning region to serve as a link between the State and Federal Governments and the local community to assist in planning for their own future development.

The 36 counties studied in this report constitute five of the state's planning regions and represent a wide variety of industries, resources, and activities. The regions and counties are listed below and are shown in Figure 1:

1. Lower Rio Grande Valley: Cameron, Willacy, Hidalgo
2. Coastal Bend: McMullen, Live Oak, Bee, Refugio, Aransas, San Patricio, Duval, Jim Wells, Nueces, Kleberg, Brooks, Kenedy
3. Golden Crescent: Lavaca, Jackson, DeWitt, Victoria, Goliad, Calhoun
4. Gulf Coast: Fort Bend, Brazoria, Austin, Walker, Montgomery, Liberty, Waller, Colorado, Wharton, Matagorda, Harris, Chamber, Galveston
5. South East Texas: Orange, Jefferson.



**FIGURE 1**

AREA OF STUDY AND THE STATE PLANNING REGIONS

## METHOD OF ANALYSIS

The basic analysis of this study is presented in three parts. The first is a brief discussion of some of the major concepts of economic development theory.

The second part is an analysis of employment data for the three major types of economic activities, regional economic index figures, and the results of a questionnaire mailed to firms which had recently located or expanded facilities within the 36-county study area. Questionnaires were mailed to 245 firms which had located or expanded in the area during 1968 and 1969 to determine the major location considerations of these firms and to ascertain the advantages and disadvantages of the locations chosen. In addition, information was obtained on the type of product, volume of sales, employment, and the major activities of the firms. A copy of the questionnaire is found in Appendix A.

The final part of the analysis is a descriptive inventory of the people, resources, and characteristics of the area on a county basis. There is an evaluation of the present conditions and the amount of changes that have occurred in the past few years, as well as a discussion of the regional changes expected to occur in the future.

## LIMITATIONS OF THE STUDY

As with any research project, the assumptions made and the framework used to reach the conclusions affect what the final conclusions are. In order to critically evaluate and correctly use the results, the reader must understand the methods and material utilized so as to know the limitations of the analysis for some problems. Also, as the report was being completed, additional data and concepts were considered; some of these were partially incorporated into this study while others are mentioned in the section on "Recommendations for Future Research."

Employment data was used as an index of economic activity development because it is readily available and is more accurate than estimates of output, value added, or taxable income for small governmental units. However, it does not allow for changes in the ratio of output to employment caused by technology and the substitution of capital for labor. Also, changes in the skills-composition of the labor force are not measured. Nevertheless, the data provides much useful information regarding the different regions and their potential. In addition, these limitations are not thought to be significant due to the relatively short five-year period used in this report.

The types of economic activity used in this study area were classified as primary, secondary, and tertiary. Only selected occupations were included in each level of activity and those which overlap between activities were omitted. Thus the employment used in this study indicates only the proportions among the different activities and the change over time; they do not represent total employment. Also, since tertiary industries tend to be labor intensive and primary industries

capital intensive, conclusions drawn using employment data as a measurement of economic activity may be slightly different from conclusions drawn using other measurements.

The economic index of the Texas Education Agency was used to complement the employment data. The method of completion of this index is briefly explained in the report. The assessed property valuation plays an important part in this index, and there is no reason to believe that the standards for such valuation are uniform throughout the region. Personal income is also included in the index without regard to the local price levels and non-money incomes received. In spite of the conceptional problem of this index, it does provide a practical way of estimating the relative contribution of each region to the state's total economy and the study area.

A mail questionnaire was used in gathering information for a part of the study. Approximately 27 percent of the total firms surveyed returned completed questionnaires. Of the 65 firms responding, 48 were located in the Gulf Coast Region which indicates the dominance of Houston and Harris County. However, since approximately two-thirds of the study area's economic activity is generated in this Region, the number of firms is proportional to the region's influence in the area. None of the above considerations significantly affect the results of the study, but they should be recognized when evaluating the results of the study.

ECONOMIC DEVELOPMENT  
CONSIDERATIONS

One way to measure regional economic development is to analyze the number of firms involved in the various types of economic activities. There are three major stages of economic development which an economy generally experiences; these stages are concerned with the amount of involvement of firms in primary, secondary, or tertiary levels of economic activities.<sup>3</sup>

The primary industries are those based on the natural resources of the earth such as, agriculture, forestry, fisheries, mining, and extraction activities. Secondary industries consist of those involved in manufacturing, processing, and construction. Tertiary industries consist of those firms which provide services to the primary and secondary industries. Typically, an area will first experience the development of natural resources, and most of the industrial activity is involved with the production or preparation of crops and livestock, lumber, fish products, and mineral and fuel extraction. As the industrial development of the area becomes more sophisticated, the secondary industries begin developing due to the economic linkage effects of vertical integration and economies of scale in the production and manufacturing systems. With the expansion of the secondary industries comes the demand for many additional supporting services of the tertiary industries in the areas of transportation, communication, wholesale

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<sup>3</sup>Colin Clark, The Conditions of Economic Progress, Third Edition, MacMillan and Company, Ltd., London, 1957. Leif Johansen, A Multi--Sectoral Study of Economic Growth, Yale University Press, New Haven and London, 1966, and Harvey Perloff and Vera W. Dodds, How a Region Grows, CED supplementary paper #17, 1963.



and retail trade, finance, and recreational and professional services. The typical development process requires that the region be able to shift emphasis from one resource base to another. For example, the primary activities are basically oriented to the location of the natural resource inputs; whereas, the secondary activities are more concerned with the factors of proximity to markets, raw material, labor, semi-processed inputs, or other factors determining the profitable operation of their firms. Finally, tertiary activities are mainly oriented towards population and consumer marketing centers.

Regions where primary industry employment dominates are generally rural and endowed with relatively valuable natural resources. The future industrial trend of the area depends on the future value of these resources, their supply, and the development of other industrial opportunities in the region. The current prevalence of primary industries does not necessarily limit nor assure future development of the region's economic base. If a region has a strong competitive advantage in the production of a certain primary product but few ways of profitably processing the resource, the region may continue to emphasize the primary activities indefinitely and have a good standard of living if the population does not expand too fast.

The rate of recent growth in the secondary industries is generally a good measure of traditional industrial development. In order for the labor force to be heavily oriented toward secondary industries, the region must generally be a net exporter of manufactured goods and possess a reasonably viable service sector. Employment in tertiary industries is almost always less than in the secondary group and is generally larger in regions where incomes are relatively high.

There are many factors which govern the location choices of an individual industry and thus affect the growth rate of a given region. Industries involved in "weight losing" activities (e.g., food processing, lumber mills, or petroleum refining) tend to be located near their source of raw materials mainly because of the importance of the transportation cost consideration. Similarly, firms and industries which have a large proportion of their cost of production associated with a specific type of labor (e.g., textiles and wearing apparel) are basically labor oriented. The preceding examples of resource oriented activities are in contrast to the market oriented activities (e.g., bakeries, breweries, retail sales, and consumer services) that are oriented to consumer markets. There are also many activities that are linked to both the raw materials and the consumer markets and are intermediately oriented between the two extremes; firms which require processed or semi-processed materials (e.g., machine shops, wholesale trade, and the manufacturers of durable goods) are found in this category. Finally, some activities which have no strong locational patterns (e.g., house trailer production or certain branches of electronics) are frequently referred to as "foot-loose" industries and tend to locate in areas which offer attractive living conditions.

All of the preceding considerations relate to "internal economies" which can be defined as the increase in efficiency within the firm or industry which was brought about through better organization or differences in the scale of operation. In addition to these considerations there are also "external economies" which refer to the increases in efficiency within the producing unit, resulting from actions outside the unit proper and are not paid for by the unit. One of the major ways external economies arise is from the proximity of other firms whose

products are closely related to the production of a specific firm. By being in an area where certain specialized services are available from others, a firm may find it less expensive and more efficient to turn over some of its calculating and routine functions to outside firms rather than performing them internally. The savings resulting from these external economies leads to the clustering of the various firms and industries which depend upon one another for the continuing productivity; these economies tend to coincide with large population centers and thus their effect frequently is to strengthen the existing tendencies to market orientation. It is the opinion of some economists that the relative importance of resources and inputs has declined over the past several decades and that the service sector has moved into the dominant position as technology and other changes have brought about a long-range reduction in the preparation of raw materials to total output. Thus the linkage of economic activities to the resource inputs has been weakened, and the "market magnet" now operates as a dominant location force.<sup>4</sup>

Economic development depends primarily upon the amount of goods and services a region produces; the greater the production, the larger the aggregate amount paid for wages, rents, interest, and profits. However, the demand for the region's production comes from internal and export sources.

A region's growth typically has been promoted by its ability to produce export goods or services at a competitive advantage with respect to other regions. The ability to export induces a flow of income into the region which tends to expand its internal markets for both national and region-serving goods and services. The extent of this so-called multiplier effect is

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<sup>4</sup>Harvey Perloff and Vera W. Dodds, How a Region Grows, CED supplementary paper #17, 1963, p. 44.

related to certain internal features that characterize the economic and social structure of the region. Regions tend to differ substantially in the degree of development that becomes associated with the growth of the export industries and in what happens to the income that flows in from the export sales.

Some of these internal features are related to the nature of the export industries and particularly to the localized industrial linkages; services attaching to the export sector are also important. Thus, the shipment of heavy export products from a region may influence the development of substantial transportation facilities and services within the region. The manufacture of machinery often brings a variety of servicing operations into being; so does the manufacture of style goods.

The quantity and type of labor required by the export industries and the relative levels of wages paid has, of course, an obvious relationship to a region's internal development. Another important feature is the income distribution that tends to be associated with a given type of regional export product.

Internal regional development takes the form both of internal structural changes (such as an increase in the proportion of the labor force employed in "advanced" manufacturing and service industries) and an expansion of the local market for all sorts of goods and services. As the regional market expands and region-serving activities proliferate, conditions may develop for self-reinforcing regional growth, and new internal factors may become important in determining the rates of regional growth. This happens when more and more industries are attracted by the external economies associated with social overhead capital and the agglomeration of industries, as well as by the desired internal economies of scale which can be achieved when producing through a branch plant on a large enough scale.

The export and internal determinants of regional economic expansion can be brought together in the concept of cumulative advantage. It is cumulative advantage, and not an unusual advantage in any one aspect, which is determining of over-all sustained economic growth.<sup>5</sup>

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<sup>5</sup>Ibid., pp. 34-35.

## FINDINGS AND ANALYSIS

In an attempt to present the findings of this study in a concise and logical manner, the information is discussed in the following sequence: employment data, economic index, questionnaire results, and a narrative evaluation of each of the five planning regions based on the above considerations.

### Employment Data

Using employment data as a measure of economic activity, this study analyzes the relative magnitude and growth trends of each of the three major industrial activity groups in the region. Although employment is not a precise indicator of income or output, when the data spans a period of several years and covers a large number of firms the results are meaningful and indicative of the region. Employment data for a certain number of key industries in each of the three types of economic activity are presented in Tables 1, 2, and 3 for each of the state planning regions within the study area. The growth for the five-year period is shown as a percentage of the 1964 total which is the earliest year for which data of this detail is available.

The contents of the first three tables are self-explanatory. Therefore, only a general discussion of the information they contain and a summary of their major points will be discussed.

Table 1 shows that for the 36-county area as a whole, nearly two-thirds of the people employed in key sectors were working for firms which were in the secondary types of economic activity. Approximately 30 percent of the people employed was in the tertiary sector and slightly more than five percent of the people was working in the

TABLE 1

EMPLOYMENT BY TYPE OF  
ECONOMIC ACTIVITY\*

REGION	PRIMARY		SECONDARY		TERTIARY		TOTAL					
	1964	1969	1964	1969	1964	1969	1964	1969				
		PERCENT CHANGE		PERCENT CHANGE		PERCENT CHANGE		PERCENT CHANGE				
Lower Rio Grande Valley	933	880	- 5.6	27,026	32,761	+21.2	11,663	14,044	+20.4	39,622	47,685	+20.3
Coastal Bend	8,818	9,208	+ 4.4	33,708	38,825	+15.2	20,504	25,756	+25.6	63,090	73,789	+14.6
Golden Crescent	1,932	1,523	-21.2	12,023	14,958	+24.4	5,264	6,614	+25.6	19,219	23,095	+20.1
Gulf Coast	19,456	29,220	+50.1	264,359	362,988	+37.3	120,274	159,201	+32.3	404,089	551,409	+36.5
South East Texas	2,258	2,425	+ 7.4	49,032	53,181	+ 8.5	20,895	24,218	+15.9	72,185	79,824	+10.6
Total	33,397	43,256	+29.5	386,148	502,713	+30.2	178,600	229,833	+28.6	598,145	775,802	+29.7

\* Figures are based only on the number of employees in selected industrial classifications as presented in County Business Patterns and indicates only the relative proportions among the activities and the change over time. They do not represent the total employment in the region.

SOURCE: County Business Patterns 1964 and 1969, and Industrial Economics Research Division, Texas A&M University, College Station, Texas.

primary industries. While the total work force increased by 29.7 percent, employment in the secondary industries increased over 30 percent. Concurrently, the total number employed in the tertiary sector rose 28.6 percent. All three factors have experienced a growth rate of approximately 30 percent during this five-year period; however, the proportion of the work force employed in the primary sector has stayed constant while the secondary industry has increased with a minor decrease in the tertiary sector.

Economic theory would suggest that in earlier days a larger proportion of the labor force was working in primary industries and less in secondary and tertiary industries. Perloff's study indicates that the proportion of the labor force in primary industries decreased from 41 percent in 1930 to less than 11 percent in 1960 for the southwestern states of Texas, Oklahoma, New Mexico, and Arizona.<sup>6</sup> In this study, the manufacturing industries remained virtually constant at 14 percent while the tertiary activities almost doubled. The figures are not precise, but they do suggest that the four states in the southwest have experienced the typical development phases.

Table 1 reveals several interesting characteristics about the thirty-six county area and its five regions. From this table the following information can be obtained.

1. The number of people in each region working in selected industries of each type of economic activity and the percentage change in employment between 1964 and 1969
2. The regions with the highest and lowest number of employees in each type of economic activity
3. The aggregate number of employed in selected industries for each region and the percentage change in this total between 1964 and 1969

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<sup>6</sup> Ibid., p. 48.

4. The regions with the highest and lowest percentage change in employment in each type of activity

The 13 counties in the Gulf Coast Region had the largest number of people employed in 1964 and also the largest percentage increase in employment during the subsequent five years. The adjacent South East Texas Region had the smallest growth rate of all regions with only a 10 percent increase. The table also indicates that the Gulf Coast Region had the most people employed in each of the three levels of economic activity (primary, secondary, and tertiary). In addition, this Region had the largest percentage gain in employment in each of these activities with a 50 percent increase in the primary sector, a 37 percent increase in the secondary sector, and a 32 percent increase in the tertiary sector. The Golden Crescent Region had the smallest number of people employed in the secondary, tertiary, and in total activities. The Southeast Texas Region had the smallest percentage increase in these three areas, and the Lower Rio Grande Valley Region had the smallest number of people employed in primary activity with a 5.6 percent decrease in employment over the five-year interval.

The conclusion to be drawn is that the Gulf Coast Region is not only the largest but also the most dynamic of all the regions in all three types of economic activities. The rapid expansion of the primary industries has been due to the increased development of the mining and extractive activities which accounted for 47 percent of the 50 percent increase in primary employment activities. The South East Texas Region's mining and extractive activities accounted for only two of the 7.4 percent increase in primary activities between 1964 and 1969. This is probably explained by the fact that the Region grew rapidly during World War II and was near an optimum population level prior to the time period covered in this study. In this instance, employment may be a poor



indication of economic growth because of the highly technical and capital intensive industrial processes prevalent in the Region.

It is interesting to note that the Lower Rio Grande Valley Region, which has frequently been associated with agricultural production and primary types of economic activities, has only a small proportion of its labor force in this area with a downward trend while there has been a considerable expansion in secondary and tertiary activities. This trend can be explained by the increased cost of agricultural labor due to the elimination of the Bracero Program, the increasing mechanization and size of agricultural operations, and the increased efforts of the area to develop its recreational and retirement living facilities and border industry advantages. The same pattern was amplified in the Golden Crescent Region which experienced a 21 percent decrease in the amount of employment in its primary economic activities, an approximate 25 percent increase in each of its secondary and tertiary types of economic activities, and slightly more than a 20 percent increase in its total employment in all three activities.

Both the Golden Crescent Region and the Lower Rio Grande Valley Region exhibit what might be called typical economic growth trends in which the amount of employment in the primary activities declines while there is a substantial development in the secondary and tertiary types of activities. The rapid expansion of the mining and extractive industries in the Gulf Coast Region has postponed the typical development process; but there is a limit to the amount of expansion of these resources. Future growth is almost certain to occur mainly in the secondary and tertiary activities. The typical growth pattern is exhibited in the Coastal Bend Region and the South East Texas Region; however, instead of having a decrease in the amount of employment in

the primary activities, there was a relatively smaller increase in employment in the primary activities than there was in the secondary and tertiary activities.

The above tendency is the same as the one found by Kuznets in a study in which he examined several decades; the general findings of his study can be summarized as follows.<sup>7</sup>

1. The share of the agricultural sector in total product declined in 12 of 13 countries, the only significant exception was Australia, in which a share of the agricultural sector remained practically constant for some eight decades. Apparently, the highly developed capital-intensive agriculture of Australia was able to maintain its share because of the network of close relations with the more industrialized mother country. This same analysis can perhaps be applied to the Gulf Coast Region, in which there is a very close relationship between the extractive industry and the rest of the industrialized economy.
2. In twelve countries, the industrial (i.e., secondary) sector share of the country's total product increased.
3. While the downward trend in the share of the agricultural sector and the upward trend in that of the industrial sector are prominent and affect all countries except Australia, the movement in the share of the service (i.e., tertiary) sector are neither marked nor consistent among countries or over long periods within a given country. The general conclusion is that the downward trend in the share of the agricultural sector was offset by the upward trend in the share of the industrial sector -- leaving no marked trend in the share of the residual service sector in the total product.

Table 2 utilizes the same data as Table 1 but expresses it as a percent of the region's labor force employed in each type of economic activity (rather than the absolute amount of employment in each activity) and the percentage change within the five-year period. This percentage change is composed of two parts:

1. General growth of the area

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<sup>7</sup>Simon Kuznets, Modern Economic Growth, Yale University Press, New Haven, 1966, pp. 86-97.

TABLE 2

PERCENT OF THE REGION'S LABOR FORCE EMPLOYED  
IN EACH TYPE OF ECONOMIC ACTIVITY

REGION	PRIMARY		SECONDARY		TERTIARY		TOTAL				
	PERCENT 1964	CHANGE 1969	PERCENT 1964	CHANGE 1969	PERCENT 1964	CHANGE 1969	PERCENT 1964	CHANGE 1969			
Lower Rio Grande Valley	2.4	1.8	-0.6	68.2	68.7	+ 0.5	29.4	29.5	+0.1	100	100
Coastal Bend	14.0	12.5	-1.5	53.5	52.6	- 0.9	32.5	34.9	+2.9	100	100
Golden Crescent	10.0	7.5	-2.5	62.6	73.3	+10.7	27.4	32.4	+5.0	100	100
Gulf Coast	4.8	5.3	+0.5	65.4	65.8	+ 0.4	29.8	28.9	-0.9	100	100
South East Texas	3.1	3.0	-0.1	68.0	66.6	- 1.4	28.9	30.4	+1.5	100	100
WEIGHTED AVERAGE	5.6	5.6	0.0	64.6	64.8	+ 0.2	29.8	29.6	-0.2	100	100

\* Figures are based only on the number of employees in select industries as presented in County Business Patterns and indicates only the relative proportions among the activities and the change over time. They do not represent the total employment in the region.

SOURCE: County Business Patterns 1964 and 1969, and Industrial Economics Research Division, Texas A&M University, College Station, Texas.

2. The changing relative importance of the different types of economic activities to each region.

Table 2 allows for the change in economic activity for each region and then indicates the relative importance of each type of activity for each region. Although the two tables have many similarities, there are substantial differences in the information presented.

In the primary sector, the Lower Rio Grande Valley had the fewest people and the smallest percentage of work force in this activity in 1969 while the Gulf Coast Region had the largest number of people and a work force with the largest percentage increase. Simultaneously, the Gulf Coast Region in 1969 had only 5.3 percent of the total work force in the primary sector; whereas the Coastal Bend Area had the largest of all five regions with 12.5 percent. Although the Gulf Coast Region had the largest number of employed in primary activities, this activity was the least important of the three types to the Region. It should also be noted that for the South East Texas Region, there was a 7.4 percent increase in employment in the primary activities between 1964 and 1969. However, the Region's proportion of the labor force employed in the primary sector declined from 3.1 to 3.0 percent during the five-year interval. Although there was a growth in employment in that sector for the South East Region, the relative importance of the primary activities to the Region declined.

Secondary economic activity was the most important source of employment for all five regions in the study area. However, it was the least important to the Coastal Bend Region which utilized about 53 percent of the labor force in these activities in 1969, which was approximately one percentage point less than it was in 1964. Simultaneously, these activities were most important to the Golden Crescent Region which had over 73 percent of the labor force working in secondary industries in 1969. The Coastal Bend Region had experienced a slight decline in employment in these activities between 1964 and 1969, while the Golden Crescent Region had almost an 11 percentage point increase. Again, the South East Texas Region, while experiencing an 8.5 percent increase in the number of people employed in secondary activities, experienced a decrease in the relative importance of these activities of 1.4 percentage points between 1964 and 1969 and a 1.5 percentage point increase in tertiary employment.

The situation indicated by percentages and absolute numbers in the tertiary sector is conflicting. The Gulf Coast Region has nearly 160,000 people employed in tertiary activities which was more than two-thirds of all the people employed in that sector by the entire 36-county study area. However, this constitutes only 28.9 percent of the Region's total employment and is less than half as important to the Region as are secondary activities. Simultaneously, the 6,614 people employed in tertiary activities in the Golden Crescent Region constitute more than 32 percent of the Region's total economic importance. Although the Gulf Coast Region experienced a 32 percent increase in employment in tertiary activities in the five-year interval, the .9 percentage point decline in Table 2 of the share of employment in tertiary jobs suggests that these activities are becoming slightly less important to the Region.

There were wide shifts in the relative importance of the three major activities among the regions. However, for the 36-county area as a whole, the relative importance of the three activities was virtually unchanged. The primary sector's relative importance experienced no change at all during the five-year period; whereas, the secondary increased 0.2 percentage points and the tertiary activities influence decreased 0.2 percentage points. This stability is in contrast to of the dynamic changes occurring within the regions, particularly the Golden Crescent Region, which experienced both the largest decrease in relative importance in the primary sector (2.5 percentage points) and simultaneously had the largest increase in the relative importance of secondary activities (11 percentage points).

Table 3 shows the proportion of each region's labor force involved in each type of economic activity. That is, each region's relative level of involvement in each type of economic activity as well as the magnitude and direction of change between 1964 and 1969 are shown. Nearly 68 percent of the people working in the primary sector were in the Gulf Coast Region; whereas, only two percent of the people were in the Lower Rio Grande Valley Region. Tables 2 and 3 both indicate that the Gulf Coast Region was the only one in which there was a relative increase in the importance of the primary activities. Employment in the primary sector within the Gulf Coast Region was almost 10 percent more in 1969 than it was in 1964; whereas, the relative importance of employment in this sector for all the other regions was less in 1969 than it was in 1964. However, this same general relation exists for the secondary and tertiary activities; the Gulf Coast Region was the only region to experience a relative increase in the share of labor force in each type of activity between 1964 and 1969. The results of this table can

TABLE 3

PERCENT OF THE LABOR FORCE IN EACH TYPE  
OF ECONOMIC ACTIVITY BY REGION

REGION	PRIMARY		SECONDARY		TERTIARY		
	PERCENT 1964	PERCENT 1969	PERCENT 1964	PERCENT 1969	PERCENT 1964	PERCENT 1969	CHANGE
Lower Rio Grande Valley	2.8	2.0	7.0	6.5	6.5	6.1	-0.4
Coastal Bend	25.4	21.3	8.7	7.7	11.5	11.2	-0.3
Golden Crescent	5.8	3.5	3.1	3.0	3.0	2.9	-0.1
Gulf Coast	58.3	67.6	68.5	72.2	67.3	69.3	+2.0
South East Texas	6.7	5.6	12.7	10.6	11.7	10.5	-1.2
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	

\* Figures are based on the number of employees in select industries as presented in County Business Patterns and indicate only the relative proportions among the activities and the change over time. They do not represent the total employment in the region.

SOURCE: County Business Patterns, 1964 and 1969, and Industrial Economics Research Division, Texas A&M University, College Station, Texas.

be misleading due to the overwhelming growth in employment in the Gulf Coast Region in all types of activities. The decrease shown for each of the other four regions does not mean that there was a decline in the number employed in this activity for the Region but merely that the increase was so small relative to the increase of the Gulf Coast figure that the latter overshadowed the importance of the former. For example, all regions experienced expanded employment in the secondary and tertiary activities between 1964 and 1969; however, in Table 3 each region except the Gulf Coast showed a decline in the relative share of the labor force in these two types of economic activities. In a sense, Table 3 shows how much the Gulf Coast Region has dominated the entire study area, and it appears that this dominance is increasing.

Economic Index. The County Economic Index is defined as a weighted average of the ratios of county to state assessed property valuation, public school population, and county income. The relative weights are 20 percent, eight percent, and 72 percent, respectively. County income is the sum of value added by manufacture, value of minerals, agricultural products produced, and total payrolls of retail, wholesale, and service establishments.

This index is computed annually by the State Board of Education based on average data for the three most recent years as published by various federal and state agencies. Basically, the index shows each county's percentage share of Texas' total economy and is defined as a "ratio of each county's economy to the total state economy."<sup>8</sup>

Table 4 shows the 1964 and 1969 Economic Indexes for each of the five state planning regions relative to the State of Texas and the

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<sup>8</sup>1970 - 1971 Texas Almanac, The Dallas Morning News, Dallas, p. 240.



36-county study area. Each number should be interpreted as the planning region's share of the state or study area's total economy; thus, the Gulf Coast Region accounted for 24.88 percent of the 1970 state's economic activity or 65.54 percent of the 36-county Texas Gulf Coast area's activity. The dynamics of the study area are indicated by the fact that the area's share of the total state economy increased 2.18 percentage points in the five-year interval to 37.96 percent.

TABLE 4  
REGIONAL ECONOMIC INDEX\*

STATE PLANNING REGION	STUDY AREA			STATE OF TEXAS		
	1964 PERCENT	1969 PERCENT	CHANGE	1964 PERCENT	1969 PERCENT	CHANGE
Lower Rio Grande Valley	4.90	4.01	-0.89	1.75	1.52	-0.23
Coastal Bend	13.73	12.66	-1.07	4.92	4.81	-0.11
Golden Crescent	4.96	4.64	-0.32	1.77	1.76	-0.02
Gulf Coast	63.34	65.54	+2.20	22.66	24.88	+2.22
South East Texas	13.07	13.15	+0.08	4.68	4.99	+0.31
TOTAL	100.00	100.00	--	35.78	37.96	+2.18

\* The 1964 and 1969 figures represent a three year average consisting of the stated year, the preceding year, and the following year.

SOURCE: Texas Education Agency, Austin, Texas, and Industrial Economics Research Division, Texas A&M University, College Station, Texas.

Questionnaire Results. The Bureau of Business Research of the University of Texas at Austin lists more than 300 firms that planned to locate or expand their facilities in the study area during 1968 and 1969. Of this total only 245 firms had located or expanded their facilities at the time the questionnaire was mailed. The questionnaire pertained to the nature of their business and their location considerations. Approximately three weeks after the initial questionnaire was mailed a follow-up was mailed to all the firms that did not reply to the first mailing. A total of 65 questionnaires was returned representing a 26.5 percent response. The questionnaire asked each firm to rank 15 factors presented in their order of importance to the firm making a location choice. Because the response to this question was only partially completed on some of the returned questionnaires, the results presented are based upon the frequency with which a factor was identified as being an important location consideration.

Table 5 presents the frequency with which each factor was ranked as one of the responding firm's five most important location considerations. The five most frequently mentioned factors were (1) near raw materials, (2) good transportation, (3) near product markets, (4) skilled labor supply, and (5) land availability. Conversely, the factors least frequently identified in the top five considerations were favorable tax structure, climate, laws and regulations, recreational and cultural activities, and educational facilities.

TABLE 5

## RELATIVE IMPORTANCE OF THE LOCATION FACTORS FOR 65 FIRMS

RANK	FACTOR	RANK	FACTOR
1.	Near raw materials	9.	Water supply
2.	Transportation network	10.	Power supply
3.	Near product markets	11.	Favorable tax structure
4.	Skilled labor supply	12.	Climate
5.	Land availability	13.	Laws and regulations
6.	Unskilled labor supply	14.	Recreational and cultural facilities
7.	Near related industries	15.	Educational facilities
8.	Office and plant space availability		

SOURCE: Industrial Economics Research Division, Texas A&M University, College Station, Texas.

Table 6 shows the five most important location factors for the 30 petro-chemical firms, the 19 firms involved with metals, machine tools, part fabrication, and the remaining 16 other firms as a group. As would be expected, there are considerable differences between the five most important factors for all 65 firms and the three sub-groups; however, most of the differences are within the ranking of the five items listed for all firms, rather than consisting of different location factors. The five least important factors for all three sub-groups are virtually identical to the five least important factors that are shown in Table 5 for the 65 firm aggregate.

TABLE 6

MOST IMPORTANT LOCATION  
FACTORS FOR SELECTED TYPES OF INDUSTRY

FIRMS	RANK OF LOCATION FACTOR
Petro-Chemical	near raw materials good transportation skilled labor supply land availability water supply
Metals-Machine Tools	near product markets good transportation unskilled labor supply skilled labor supply land availability
All Others	unskilled labor supply near product market skilled labor supply land availability office and plant space availability

SOURCE: Industrial Economics Research Division, Texas A&M University  
College Station, Texas.

Table 7 shows that the size of the firms' operation altered the importance of the different location factors. The firms whose annual gross revenues exceeded \$10 million emphasized the importance of raw materials, good transportation, and a skilled labor supply; these firms were generally involved in the production of chemicals, fertilizers, plastics, and petroleum related products. The intermediate size firms tended to emphasize the same location considerations but were more involved in manufacturing and wholesale distribution activities such as food processing, electronic components, metal parts and machine tools. The smaller firms stressed the importance of proximity of products markets, and unskilled labor supply and the availability of existing

office and plant space. These firms were engaged in a variety of activities relating to petro-chemicals, leather goods, paper, and plumbing fixtures and pipe.

TABLE 7  
INFLUENCE OF FIRM SIZE UPON  
LOCATION CONSIDERATIONS

<u>FIRMS WITH GROSS REVENUE</u>		
BELOW \$250,000	\$250,000 TO \$10 MILLION	ABOVE \$10 MILLION
1. Near product market	1. Near product markets	1. Near raw materials
2. Unskilled labor supply	2. Good transportation facilities	2. Good transportation facilities
3. Office and plant space availability	3. Land availability	3. Skilled labor supply
4. Good transportation facilities	4. Skilled labor supply	4. Land availability
5. Skilled labor force	5. Unskilled labor force	5. Water supply

SOURCE: Industrial Economics Research Division, Texas A&M University, College Station, Texas.

The firms were also asked to list the main disadvantages associated with their Gulf Coast site. Table 8 shows that 34 firms responded and cited six general problem areas. Most disadvantages reported were related to markets, labor and transportation/communication, and a few dealt with climate, cultural and educational facilities, and political jurisdictions. Twenty of the firms said they were not aware of one or more of the cited disadvantages when they located, and six indicated that they knew of the area's disadvantage before locating in the area.

TABLE 8

LISTING OF THE MAIN DISADVANTAGES OF  
THE TEXAS GULF COAST AREA

FREQUENCY	DISADVANTAGES
12	Markets -- foreign competition, distance to input and output markets, lack of machine tools, parts and other services
8	Labor -- shortage of skilled and specialized labor, particularly building trades, high wages and "unfavorable" labor attitudes, "highly structured" labor supply
5	Transportation/ Communication -- need better direct air routing and tracing service, better rail service, and direct dialing long distance telephone service
3	Legal/Political -- multi-agency regulation of operation
3	Climate -- hurricanes, weather
3	Cultural and Educational Activities -- lack of activities, poor seashore recreation, poor schools

SOURCE: Industrial Economics Research Division, Texas A&M University, College Station, Texas.

An insight into the economic base and stability of the firms questioned was obtained by studying their market areas. Approximately 40 percent of the inputs utilized by these firms was obtained within 100 miles of the plant, and approximately 60 percent came from less than 500 miles away. Only 22 percent of these resources originated more than 1,000 miles away from the study area. The distribution of the output was

more diffused over the nation than were the inputs, with only 24.9 percent of the products destined for a market within 100 miles of the plant and 30.7 percent shipped more than 1,000 miles.

This trend of greater sales than purchases to the more distant markets indicates a growing export base with relatively broad-based markets. Such a market structure provides additional stability to the fluctuations of local economic and political activities as well as providing a multiplier effect within the study area. The distance of the source and destination of material data are shown in Table 9.

TABLE 9  
DISTANCES OF INPUTS AND OUTPUTS

MILES	PERCENT OF INPUTS	PERCENT OF OUTPUTS
0-100	38.9	24.9
100-500	20.9	19.9
500-1,000	18.2	24.5
over 1,000	<u>22.0</u>	<u>30.7</u>
TOTAL	100.0	100.0

SOURCE: Industrial Economics Research Division, Texas A&M University, College Station, Texas.

An analysis of markets must also include a study of the transportation links between markets. Table 10 shows that the firms included in the sample relied most heavily upon trucks for the movement of both inputs and outputs, with railroads as the next most important mode of transportation. Approximately 41 percent of the inputs and outputs were transported by truck; while air, rail, and water carriers were used more for outputs than inputs, and the pipelines were used relatively less for outputs. The rather low percentage of products transported by pipelines is indicative of the fact that the spectrum of products

exported out of the study area is broad and consists of many products other than natural gas and fuel oil.

TABLE 10

MODE OF TRANSPORTATION  
FOR INPUTS AND OUTPUTS

MODE	PERCENTAGE	
	INPUT	OUTPUT
Air	4.21	7.90
Rail	22.90	25.90
Truck	41.04	40.50
Pipeline	21.40	11.95
Water	<u>10.45</u>	<u>13.75</u>
TOTAL	100.00	100.00

SOURCE: Industrial Economics Research Division, Texas A&M University, College Station, Texas.

The firms surveyed tended to employ a skilled labor force. Questionnaire returns indicate that the labor force was described as 60 percent skilled, 25 percent semi-skilled, and 15 percent unskilled. The high proportion of skilled employees is due in part to the large influence of the petro-chemical firms in the Houston area which are capital intensive and utilize primarily skilled labor.

The industries represented and the size of the firms varied considerably. Table 11 shows the variety of industries represented and the predominance of the petroleum-chemical, aluminum, and machine tool sectors which accounted for 75 percent of the total number of firms. The typical firm employed 315 persons on a full-time basis; however, the income data indicates that there was substantial variation in the size of operations. Of the firms reporting operational revenues, ten firms earned a gross revenue of less than \$250,000 in 1969, eight



earned between \$250,000 and \$1 million, 14 were in the \$2 to \$5 million category, and 11 had revenues in excess of \$10 million.

TABLE 11  
RESPONDENTS BY INDUSTRY GROUP

NUMBER OF FIRMS	INDUSTRY GROUP
30	Petroleum, chemical, rubber, plastics, and related products
10	Machine tools and parts fabrication
9	Metals, aluminum parts and construction materials
4	Fixtures, pipe, marble, and synthetic-marble goods
3	Electronic hardware and instruments
3	Paper goods
3	Apparel and leather goods
1	Marine transportation industry
1	Business services and advertising
1	Seafoods
<u>65</u>	

SOURCE: Industrial Economics Research Division, Texas A&M University, College Station, Texas.

The primary interest of most of the surveyed firms was in the wholesale activities of finished goods. Seventy-three percent of the collective roles of reporting firms involved wholesale transactions, with the remaining 27 percent consisting of retail sales. Coincidentally, 73 percent of the output of these firms was in final form ready for their ultimate users, while 27 percent was sold in semi-finished form to subsequent processors. Ninety-one percent of the firms' gross

revenue was derived from the sale of goods with only nine percent coming from the sale of services.

It is clear from the study of the types of responding firms that the factor ranking reported has meaning only for the types of industries involved. Large segments of Texas Gulf Coast marine industry are not represented in the sample; these are industries whose growth and expansion are not directly related to plant expansion and acreage development. The \$1.7 billion marine transportation industry is reported to be the largest single segment of the Texas marine-related industry group with 29 percent of the total Texas ocean market.<sup>9</sup> Growth of the marine transportation industry is related more closely to ship construction and acquisition and port facility use than to traditional physical plant expansion. The second largest share of the Texas marine market is that of the tourism and recreation industry with an estimated 1970 sales of \$1.6 billion or 27 percent of the total market. Similarly, the growth of this industry is related to public as well as private facilities, climatic and ecological conditions of existing beaches and parks, income levels, population, mobility, and the available leisure time of consumers. The industrial components of the Texas ocean market are shown in Table 12.

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<sup>9</sup>Texas Industry and the Ocean, Report, House of Representatives Interim Study Committee on Oceanography, November 30, 1970, p. 3.

TABLE 12  
TEXAS' MARINE MARKETS

MARKET	BILLIONS
Transportation	\$ 1.700
Tourism and recreation	1.600
Ocean construction	.790
Oil and gas	.640
Waterfront development	.500
High technology	.250
Fisheries-mariculture & aquaculture	.220
Chemicals and minerals	.110
TOTAL	<u>\$ 5.810</u>

SOURCE: Sixty-second Legislature, Texas House of Representatives Interim Study Committee on Oceanography, Austin, 1971.

While the ocean-market data is for the whole state, it does give some indication of the relative importance of those industries whose contribution to the marine economy may be great, yet not directly related to plant expansion as measured in this study. Thus identification of all factors important to overall growth and efficient development of all regional marine resources will require further study of each of the predominant marine-related industries.

Summary of Questionnaire. The results of the surveyed firms give some indication on the nature and direction of industrial location considerations in the Gulf Coast area. A large proportion of the new and expanding firms is involved in the production of physical goods in the petroleum, chemical, aluminum, and machine tool industries. Although there is bound to be an expansion of the area's marine resource activities in the future, their relative importance will remain rather small due to the dynamic growth in other industries.

Nearly three-fourths of the products produced by the surveyed firms are in final form ready for use, and almost the same proportion of the firm's revenue was derived from wholesale activities of goods being shipped out of the region. Most of the firms were in secondary types of economic activities and engaged in exporting the region's resources in the form of finished products to other parts of the United States. The extent of the region's exporting activities is indicated by the fact that almost 40 percent of the inputs used by these firms comes from a source less than 100 miles away, but only 25 percent of these firms' output is sold within that same distance. Also, the fact that more than 21 percent of the input is transported by pipeline while less than 12 percent of the output is carried by this means reinforces the hypothesis that petroleum is the major input for many of the chemical, rubber, plastic, and related products.

The five most important attractions of the region to the newly located firms were the nearness of raw materials, the existing transportation facilities, the proximity of product markets, the availability of a skilled labor supply, and the availability of land. It is interesting to note that these five items are factors which tend to be associated with the general area, while the least frequently mentioned items relate more to special situations offered by a certain site. The rapid growth of the study area can be explained to a large extent by its favorable situation regarding all of the most frequently mentioned factors; however, the question of why a firm selects a certain site within the region is a different question. Local communities have little control or influence over such factors as proximity to raw materials, types of transportation available, and proximity and size of markets; these factors are primarily the attributes of a

region. After a firm has selected a general area based on these considerations, the specific site selected will be affected by appeal of the various communities within the region and the factors over which they do have some control such as the educational facilities, recreational and cultural activities available, suitable power and water supplies, and taxing policies. Communities located in an area, such as the Texas Gulf Coast, that possess the major items industries seek when locating a plant should also experience substantial growth if they are to improve the attractiveness of their local resources and be competitive with other expanding communities in an expanding area.

The most frequently mentioned disadvantages of the area involved markets, labor, and transportation facilities. This emphasizes again how important these factors are to industries and suggests that the Texas Gulf Area offers a competitive advantage regarding these factors relative to other areas; however, the firms within the study area would like to see lower labor costs, closer markets, and better communications. Despite the disadvantages cited, 62 of the 65 responding firms said they would choose the same site again.

SOCIO-ECONOMIC CHARACTERISTICS  
OF STATE PLANNING REGIONS<sup>10</sup>

This section combined some of the preceding data with additional regional information so as to provide a more comprehensive understanding of the present status of each of the five regions and their probable future type of development.

South East Texas State Planning Region. The South East Texas State Planning Region consists of Orange and Jefferson Counties located at the east border of Texas on the Gulf Coast. The Region is primarily industrial with 90 percent of the population living in urban areas. The agricultural sector is the smallest of any region of the study area. The low lands around Sabine Lake form one of the most important rice producing areas of the United States.

The minerals of the Region have dominated its economic growth since January 10, 1901, when the oil field "Spindletop" came into oil production near Beaumont. The result has been one of the largest petrochemical complexes in the world with plants of virtually every large firm in the industry located along the various waterways which provide access to the Gulf and the world. Sulphur and salt are produced in large quantities. Shipbuilding is big business in the Region and a "moth ball fleet" of 86 ships is kept at the Port of Orange. Three ports serve the Region at Port Arthur, Orange, and Beaumont; and the Gulf Intracoastal Waterway provides barge access all along the United States Gulf Coast from Brownsville to Florida.

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<sup>10</sup>This section is based on the analysis of data produced by the Bureau of the Census, Texas Crop & Livestock Reporting Service, Texas Mid-Continent Oil and Gas Association, City-County Data Book 1967, County Business Patterns and the Texas Almanac.

The Region grew very rapidly during World War II due to the need for numerous petro-chemical products. As a result, the current trends do not reflect the recent growth of the Region in productivity and income. The current population of the Region is 313,000, up 2.3 percent from the 1960 figure with Orange County growing 16 percent and Jefferson County declining one percent. The population is dense with an average of 240 people per square mile throughout the Region. The median educational level is above the state average of 10.8 years, and the relatively high median family income of \$6,000 is the highest of any region in the study area. In this region 55.5 percent of the population is in the working age range of 18-64, while 5.8 percent is older, and 38.7 percent is younger. Twenty percent of the people is non-white, and only 2.7 percent is of Spanish surname.

The agricultural sector of the economy is small by regional standards, but large in terms of state and national rice production. The Texas Crop and Livestock Reporting Service estimated the 1968 income from cash crops, mostly rice, is \$20 million annually; from livestock sales approximately \$5 million, and government payments add only \$57,000.

The Region is characterized by low, open terrain, with some pine forests in Orange County. The average annual rainfall is the heaviest in the state of 50-55 inches, and the average number of frost-free days is 250 each year. The soil is slightly acidic loam and clay with some calcium content.

Data in Appendix B shows that in the late 1960's the annual income from manufacturing was more than \$917 million, while the value of

minerals extracted was almost \$92 million, and farm income was less than \$25 million. The 1969 estimated effective buying income per capita was \$2,811 which is the highest of all five regions.<sup>11</sup>

The three ports of the Region handle large amounts of cargo, mostly in the form of liquid petro-chemical products. Exports are much larger in quantity than imports, and 80 percent of both are transported to and from the ports by rail. The most important imports are alumina, fabricated steel parts, and coffee. Commercial fishing is not a large enterprise in the Region.

The economy of the Region is stable being based on large proven reserves of petroleum resources and a highly developed industrial complex. Table 4 shows that the South East Texas Region accounts for almost five percent of the state's economic activity and 13 percent of that of the study area.

A study of employment trends in key industries of the primary, secondary, and tertiary economic activities reveals that recent growth has been orderly and steady, suggesting that regional resources have been developed to near capacity and that growth is resulting from technological advances rather than from new discovery or development of natural resources. The overall increase in employment in the selected industries was 10.6 percent during the five-year study period. This was the lowest growth rate for any of the regions and well below the study area's 30 percent growth rate. However, as seen in Table 1, the growth was well balanced with tertiary activities increasing employment by 16 percent, secondary by almost nine percent, and primary

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<sup>11</sup>(c) 1970, Sales Management, Survey of Buying Power; further reproduction is forbidden.



by seven percent. It seems that the future economic development of the Region will be slow and steady, supported by the public need for energy and chemicals. Another factor important to the Region is the federal government regulation of oil production and imports. As long as current policies are maintained, the economic base of the Region is virtually insulated from adverse market forces.

Early success of current research in the field of nuclear power generation could significantly influence the regional economy. However, the rapidly expanding demand for energy of all forms is so great that the development of nuclear energy will be a supplement rather than a substitute for the demand for petroleum for the next several decades.

Gulf Coast State Planning Region. The Gulf Coast State Planning Region is located on the Texas Gulf Coast near the southeastern corner of the state. The Region includes thirteen counties: Fort Bend, Brazoria, Austin, Walker, Montgomery, Liberty, Waller, Colorado, Wharton, Matagorda, Harris, Chambers, and Galveston. The Region is centered around the Houston metropolitan area and includes the cities of Galveston, Texas City, Brazoria, and Freeport. Both Houston and Galveston-Texas City are Standard Metropolitan Statistical Areas.

The terrain is coastal prairie with light vegetation, consisting mainly of post oak, with a dark acidic soil and some sandy loam. The elevation reaches 300 feet. The Region receives 40-50 inches of rainfall annually and has 260-280 frost-free days per year.

The 1970 population of this 12,428 square mile Region was 2,268,379, which was 34 percent larger than the 1960 level. In this Region, 6.6 percent of the population is over 64 years of age and 56.1 percent is between the ages of 18 and 65. The median educational level is 11 years, compared to the state average of 10.4 years. Racial composition of the population is 20 percent non-white and seven percent Mexican-American. Appendix C shows that the population is 85 percent urban and the effective buying income per capita was \$2,761.

Secondary activities were the most important type of activity in this Region also in terms of income as well as employment. However the strong influence of the primary activities is indicated by the \$850 million worth of minerals extracted in 1967. The value of the manufacturing activities in Appendix C is almost \$2.6 billion while farm income for the Region is almost \$248 million.

The agricultural sector of the regional economy is more than twice as large (in terms of income) as the agricultural sector of any other

region in the study area with the major products being cotton, rice, and cattle. In 1968, income from crops was \$144 million, income from livestock products was \$94 million, and government payments amounted to \$10 million.<sup>12</sup>

The industrial sector of the Region is centered around the petroleum, transportation, and aerospace industries. The Region contains four major ports at Houston, Galveston, Texas City, and Freeport, whose 1969 tonnage reached a record 81,131,020 short tons.<sup>13</sup> The goods imported at these ports represent a wide variety of industries, the most important being fish meal from Peru, steel and automobiles from Europe, coffee from South America, and some chemicals. Chemicals, fertilizers, and other petroleum products constitute the bulk of exports with grains and flour also being significant. Fishing is relatively unimportant in the Region due to both the effluents from petroleum and chemical facilities throughout the area and the proximity of fertile seabeds near Brownsville.

The economic activity of the Gulf Coast State Planning Region constitutes almost one-quarter of that of the state; economic activity rose from 22.6 percent of the state's total in 1966 to 24.8 percent in 1969 as was shown in Table 4. The dominance of this Region in the state economy is due to both the petroleum resources and to the mix of advanced technology industries which support a highly paid urban population.

A study of regional employment growth by type of economic activity reveals the importance of the extractive industries. Table 1 indicated

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<sup>12</sup>Texas Almanac 1970-71, The Dallas Morning News, Dallas, pp. 398-399.

<sup>13</sup>United States Army Corps of Engineers, Waterborne Commerce of the United States, 1969, Part II.

that during the period 1964-1969, industrial employment increased by 36 percent. The primary industries (agricultural services, mining, forestry, and fisheries) increased their employment by 50 percent, although they still comprised only 5.3 percent of the Region's total employment. Nearly two-thirds of the employees in the Region worked in the secondary industries (manufacturing and construction), which showed a 37 percent increase in the five-year period, while the tertiary activities expanded 32 percent during the study period.

Regional goals are heavily influenced by the air and water pollution problems generated by industry, and public and private efforts on behalf of environmental quality are likely to affect future expansion and development within the Region. However, because of the area's proximity to product markets, raw materials, good labor supply, adequate transportation facilities of all forms, and capacity for further economic development, the Region will probably continue to be one of the most dynamic for the next several decades.

Golden Crescent State Planning Region. The Golden Crescent State Planning Region is located in the center of the Texas Gulf Coast around Victoria with access to the Gulf at Port Lavaca. The Region consists of 5,309 square miles including the counties of Calhoun, Lavaca, Jackson, Victoria, Goliad, and DeWitt. Victoria is the largest city with a 1970 population of 39,000; the Port Lavaca-Point Comfort area is inhabited by 11,000 people. While these areas are the most populous of the Region, they include only one-fourth of the regional population of 122,360, which is 52 percent urban. This Region has the smallest ratio of urban to rural population of any in the study area as shown in Appendix B; the 1969 effective buying income per capita was \$2,415.

The regional population declined slightly during the 1960's to 122,360 in 1970. The population of the Region is generally older and less educated than that of the other regions. The median educational level is 8.8 years, almost two years less than the state average. In this Region 8.7 percent of the people is over 64 years of age, while 40 percent is under 18 years of age. Ten percent of the people is non-white, and 19 percent is of Mexican-American stock.

The vegetation of the Region is sparse, with some mesquite and post oak in the south and west. The soil is generally dark acetic loams and clays not nearly so fertile as the soil to the south near the Rio Grande Valley. The terrain is rolling prairie, reaching an elevation of 300 feet along the northwest border of DeWitt and Lavaca Counties. Average annual rainfall is 35-40 inches, and the average yearly number of frost-free days is 280.

The income data in Appendix B shows that the \$146 million annual income from mineral extraction was larger than the \$134 million

produced by manufacturing or the \$72 million from farm income. Because of the capital intensive nature of the primary activities their importance to the Region was not revealed by the labor data in Table 1, which shows that there are several times more people employed in secondary than in primary activities. The most important minerals of the Region are petroleum, natural gas, and shell.

The agriculture sector of the economy is small compared to most of the other regions; the major farm products are cattle, rice, and cotton. Appendix B shows the Region's farm income to be nearly \$73 million in 1968. Livestock sales accounted for \$42 million, crop income amounted to \$26 million, and government payments totaled almost \$5 million.<sup>14</sup> Livestock production has been so profitable that oil companies have had difficulty exploiting the oil and natural gas reserves in some parts of the Region.

The industrial sector is almost wholly devoted to processing of the aluminum ores. The port facility at Port Lavaca-Point Comfort is the focal point of this activity, where most of the non-agricultural income is generated. Port Lavaca is known as a fishing and sailing resort, as well as being an important port for mineral products. The port is located 25 miles from the Gulf Intracoastal Waterway on the Matagorda Ship Channel. Point Comfort is nearby, and both port facilities are served by a 36-foot dredged channel. Freight traffic in 1969 was over five million tons, most of which was imported alumina and non-metallic ores.<sup>15</sup> The Aluminum Company of America and Union Carbide

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<sup>14</sup>Texas Almanac 1970-1971, Dallas Morning News, Dallas, pp.396-97.

<sup>15</sup>United States Army Corp of Engineers, Waterborne Commerce of the United States, 1969, Part II.

Corporation are the principal industrial taxpayers of the port area. Alcoa's ore imports constitute more than one-half of the activity of the port. Most of the company's finished products are consumed within the United States and are shipped by rail. Basic chemicals produced by Union Carbide account for the second largest part of the port activity, but it is only 10 percent of the total annual traffic. Numerous metal and non-metal ores and products are exported in small quantity.

The relative growth of the Golden Crescent Region has been practically dormant in recent years. During the period from 1966 until 1969, the Region's portion of the total economic activity in the study area declined slightly from 4.9 percent to 4.6 percent, and the growth rate of the Region was less than that of the 36-county study area in terms of employment.

A study of employment trends by type of economic activity, as was shown in Table 1, reveals that both the secondary and tertiary industries increased their employment by about 25 percent during the study period, while primary industry employment decreased 20 percent. This reduction was due to the expansion of the minimum wage law to include agriculture, the continuing mechanization of farm operations, and the capital intensive nature of the extractive industries.

Regional goals are oriented toward improving regional markets and protecting environmental resources. There is concern for vocational education and for the establishment of a four-year college within the Region; presently Victoria College, a public two-year school, has an enrollment of 1,500.

The current rate of economic growth of the Region is low. The Region is now in a period of transition from an agricultural based

economy to one based on industry. Presently, a thriving commercial nucleus exists in the Port Lavaca-Point Comfort area, but the western counties of the Region have few non-agricultural activities. With time, an expanding population, and rising per capita income, these counties should grow; however, due to their lack of significant natural resources, industrial opportunities, or transportation facilities, the rate of growth for these counties will probably be rather slow and will tend to offset the higher growth rates of the coastal area.



Coastal Bend State Planning Region. The Coastal Bend State Planning Region is located on the southern part of the Gulf Coast and is centered around Corpus Christi and Padre Island. The counties included in this Region occupy over 12,000 square miles and consist of: McMullen, Live Oak, Bee, Refugio, Aransas, San Patricio, Duval, Jim Wells, Nueces, Kleberg, Brooks, and Kenedy. Vegetation is sparse and dominated by mesquite forests, and the elevation reaches 500 feet in McMullen County. With an annual rainfall of approximately 35 inches, the long growing season has an annual average of 280-300 frost-free days with the major agricultural products being cotton, livestock, and vegetables. Soils are generally fertile consisting of dark clays and loams with a saline problem existing only near the coast. Primary minerals of the Region are oil, sulphur, salt, and lime.

The Coastal Bend Region contains only one large city, Corpus Christi, yet 76 percent of the population lives in urban areas with one-half of the regional population in the Corpus Christi metropolitan area. Population in the Region is approximately 410,000 and has grown only one percent during the preceding ten years; the city of Corpus Christi grew by eight percent during the same period.

Median adult educational level is 9.4 years, one full year less than the state average, and the effective buying income per capita is shown in Appendix D to have been \$2,286. Age distribution of the population is similar to that of the other regions and the state: people between 18 and 64 years of age account for 52.8 percent of the population, persons under 18 years of age comprise 40.0 percent, and those individuals 65 years of age and over total 7.2 percent of the population. Non-whites constitute only 3.7 percent of the population while Mexican-Americans represent 42 percent of the total.

Manufacturing was the primary source of income in the Region and accounted for \$2.4 billion. The minerals extracted added \$548 million more, and farm incomes totaled an additional \$107 million.

The agricultural sector of the economy is based on cotton, vegetables, and livestock. The famous King Ranch is located within the Region and shares in the \$52 million annual income from livestock; income from cash crops is \$42 million, while government payments add an additional \$13 million.

The industrial sector is centered around the seafood industry, petroleum resources of the Region, and the transportation hub at the Port of Corpus Christi. The Port of Corpus Christi is the major port of the Region and ranks ninth in size in the nation with ten percent of the Intracoastal Canal traffic moving through this Port and its 40-foot deep channel. Annual tonnage through the Port is 30 million, of which 23 million is liquid cargo. Major imports are steel from West Germany and zinc from Japan. Petroleum is the major export, much of which is bound for Southeast Asia. Cotton and grains are also shipped in large quantities to Europe and Japan.<sup>16</sup>

The rich seabeds near the Region provide a large source of income. Ports in the Region land the second largest Texas shrimp catch each year. The 1968 catch had a value of \$12 million which represented 25 percent of the state's total.<sup>17</sup>

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<sup>16</sup> An Economic Feasibility Study for the Future Expansion of the Port of Port Lavaca-Point Comfort, Industrial Economics Research Division, Texas A&M University, College Station, 1969, p. 26.

<sup>17</sup> John Miloy and E. A. Copp, Economic Impact Analysis of Texas Marine Resources and Industries, Industrial Economics Research Division, Texas A&M University, College Station, 1970, p. 94.

The economy of the Coastal Bend counties is growing slightly faster than that of the state, as was shown in Table 4. The Region now accounts for five percent of the state's economic activity and over 13 percent of the study area's economy. Although employment in the Region grew 14.6 percent between 1964 and 1969, it experienced the second lowest growth of the five regions examined and grew at a rate slightly less than 50 percent of the 36-county study area.

The Region includes the Aransas National Wildlife Refuge and the Padre Island National Seashore which contribute to the recreational value of regional resources. Port Aransas is known as a sport fishing resort because of its weather and proximity to excellent deep water fishing in the Gulf.

Educational institutions in the Region include Texas A&I University at Kingsville and the University of Corpus Christi and Del Mar College, both located in Corpus Christi. Regional leaders recognize the need for the establishment of a new public four-year college.

The primary goals of the Region are directly related to the continuing efforts for economic development as well as concern for environmental quality. It appears that the industrial success and the associated environmental problems of the Houston-Galveston area are being closely examined by the Coastal Bend leaders who are cautiously entering their highly industrialized era. One of the high priorities of the Region is the enforcement of strict water quality standards and the further development of water economy and reclamation measures. A form of the Texas Water Plan is supported to provide adequate water for agricultural use.

The goals of creating a South Texas Trade Association and of encouraging tourist trade through the development of highways, parks, and convention facilities will serve to stimulate the Region. Each of these goals, if implemented, would help develop the Region and improve inter-regional trade.

Lower Rio Grande Valley State Planning Region. The Lower Rio Grande Valley Region is composed of Cameron, Willacy, and Hidalgo Counties and is located on the southernmost tip of Texas covering a 3,030 square mile area. The Region includes the Standard Metropolitan Statistical Area of McAllen-Pharr-Edinburg and has a total 1970 population of 325,407, which is eight percent less than the 1964 figure.

The median adult educational level and the effective buying income per capita of \$1,638 are the lowest in the study area. The population is 70 percent urban, one percent non-white, and 68 percent Mexican-American. More than 45 percent of the population is between the ages of 18 and 64 years, with the people 65 years of age and over constituting 8.5 percent of the population up from 5.8 percent in 1960. The last two figures reflect the area's efforts to entice retirees to live in the Region.

The income data in Appendix B indicates that agriculture provides the major source of income to the area. Annual farm income recently totaled \$133 million, the value of manufacturing was approximately \$75 million, and mineral extractions accounted for an additional \$53 million. Although the primary activities employ a small and declining percentage of the labor force, their importance to the Region in terms of income generated is significant.

The 1968 agricultural gross income of the Region was \$98 million from crops, \$14 million from livestock, and \$21 million from government payments.

The Port of Brownsville, the southernmost Texas deep-sea port, is the southern terminus of the Gulf Intracoastal Waterway system, which spans the entire northern shore of the Gulf to the State of Florida. The Port connects with the Mexico National Railway and allows a low switching rate, contributing to large annual shipments of fluor spar, manganese, barites, lead, and zinc to the Central and Eastern United States. In 1969, 2,040,450 tons of freight were moved through the Intracoastal Waterway of the Region, and 5,271,102 tons of exports and imports were loaded at the Ports of Brownsville and Port Isabel.<sup>18</sup> Much of the water traffic is in crude oil, including all of the Port Isabel traffic which is strictly a pipeline facility. The combined tonnage of the two Ports increased by 12 percent between 1964 and 1969.

Fishing is also an important source of income in the Region. Over 2,000 tons of prepared fish were shipped from the Region's ports in 1969.<sup>19</sup> The 400 fishing trawlers operating from the Brownsville Port catch more shrimp each year than any other fleet in the nation. Recent concern about oil spills and environmental problems has tended to shift the emphasis from industrial development to more concern with promoting tourism, retirement living, and recreation. The continued expansion of the Region's fishing industry will tend to complement these other areas of expansion.

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<sup>18</sup>Waterborne Commerce of the United States, United States Army Corps of Engineers, 1969, Part II, p. 125.

<sup>19</sup>Ibid, p. 49.

The economy of the Region grew at a slower rate than the state from 1964-1969. As was shown in Table 4, the Region accounted for 1.75 percent of the state's economic activity in 1966 and 1.52 percent in 1969. Population declined during the same period as did employment in primary activities. This change was due in part to mechanization of primary activities, increase in the minimum wage law as applied to agricultural workers, and the termination by the United States of the "bracero" migrant labor program in late 1964. Employment in secondary and tertiary activities increased by 20 percent during the study period.

Local organizations have been active in planning for the future economic growth and development of the Region. McAllen Trade Zone, Inc., was founded in 1966 to work for the establishment of a Federal Foreign-Trade Zone in the Region which was established in October, 1970, to enable the Region to take advantage of resources and natural surroundings. By January, 1971, eleven firms were committed to production sites in the new Zone. A Foreign-Trade Zone is an area in the United States near a port of entry where local or foreign firms may import foreign merchandise duty free for refinement, storage, sorting, repackaging, assembly, or manufacturing. The resulting products which are then re-exported to other countries are not subject to any United States duty. Those products shipped within the United States are subject to standard duties only when they leave the Zone. This device is particularly efficient for firms which need to operate in a politically stable environment or whose duties are greatly reduced by the opportunity to refine and discard incoming materials in the United States. The Foreign-Trade Zone is an alternative to

a plant location in another country. For some smaller firms, access to the Zone may make possible operations that would not be within their capabilities if actual international operations were otherwise required.<sup>20</sup> A similar device is being employed by the Republic of Mexico in an attempt to foster the economic growth along the Mexican border area entitled the "Programa de Industrialization Fronteriza."

The implications of the border zone program for the development of the Texas Lower Rio Grande Valley State Planning Region could be important to the long-run economic development of the Region. Already, shrimp packaging plants are in operation and many industrial assembly operations are feasible at the low labor costs prevailing in the border zone. The growth of these industries could contribute significantly to the internal economy of the Region in the future.

Future development of the Region would appear to be based mainly upon the expansion of secondary and tertiary types of economic activities rather than the primary types. In the future there should continue to be more light industry, foreign trade, tourism, recreation, and retirement living facilities.

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<sup>20</sup>Selected Data Sheets on McAllen Foreign-Trade Zone, McAllen Trade Zone, Inc. 1970.



## CONCLUSIONS

The process of economic development varies with each economy; however, there are certain characteristics and patterns that are frequently experienced by a developing region. One of these patterns is concerned with the relative importance of the primary, secondary, and tertiary levels of economic activity to the region. Typically, the natural resources are mined, extracted, caught, or grown and then exported to other areas. Later the secondary activities are developed to manufacturing and processing the natural resources locally rather than exporting the raw materials. These activities, in turn, require many supporting or tertiary services. Thus, the transportation, wholesale and retail trade, financing and professional services are expanded.

In general, the Texas Coastal Area has followed this pattern of development. There was nearly a 30 percent increase in employment in all three types of economic activities between 1964 and 1969 with the Gulf Coast Region, which includes the Houston-Galveston area, being the largest and most rapidly growing. With the exception of the Gulf Coast Region, all the regions' primary activities either decreased or increased at a smaller rate than their secondary and tertiary industrial activities increased. Conversely, the Gulf Coast Region experienced a 50 percent increase in employment in primary activities. However, this large increase in the primary sector was due almost entirely to the expansion of the petroleum extractive activities, and in the future it appears that the relative importance of the primary activities in this Region also will decline as the industrial and commercial activities continue to expand. The influence of the Gulf Coast Region is overwhelming regardless of the unit of measurement used. The Region

accounted for approximately 25 percent of the economic activity of the state and 66 percent of the economic activity of the study area, and the trend is upward.

Both the Lower Rio Grande Valley and the Golden Crescent Region experienced aggregate employment growths in excess of 20 percent during the five-year interval while having an absolute decrease in the number of employees in the primary activities. The ten percent expansion of the South East Texas Region was the lowest growth rate of the five regions and had the least differences among the three types of activities.

In terms of the relative distribution of the regions' labor force, the primary activities were most important to the Coastal Bend Region (12.5 percent) and least important to the South East Texas Region (3.0 percent). However, of the five regions, the Golden Crescent Region had the largest decline in the proportion of employees in the primary activities, the largest increase (73 percent) of workers in the secondary activities, and the second largest share of workers (32 percent) in the tertiary employment. The employee distribution for the entire study area was approximately 5, 65, and 30 percent, respectively, for the primary, secondary, and tertiary activities.

In the future, the Gulf Coast Region will continue to become the center of economic activities in the coastal area. However, the Golden Crescent Region is rapidly shifting from primary activities into the secondary activities of refining and manufacturing; the Lower Rio Grande Valley is experiencing the same pattern of growth, but manufacturing activities are more labor intensive and the importance of tourism and retirement living is greater. The South East Texas Region will continue to have a moderate expansion in all types of economic

activities while the Coastal Bend Region should have a high rate of development due to the more diversified base of the Region and the expansion of the secondary and tertiary activities.

Approximately 41 percent of the raw materials and final products was transported by truck. This fact combined with the importance of a good transportation network in affecting plant location decisions indicates that the Texas highway system has played a major role in the development of the coastal area.

The five most important factors affecting industrial location within the region were: nearness to raw materials, good transportation, nearness to product markets, skilled labor supply, and land availability. The five factors identified as being least important were: favorable tax structure, climate, laws and regulations, and recreational facilities.

Seventy-five percent of the firms surveyed was associated with the petroleum, chemical, aluminum, or machine tool industries with 39 percent of the raw materials obtained within 100 miles of the firms. However, many of the products were produced for markets outside the study area with 31 percent of the finished goods being shipped more than 1,000 miles. Thus, the study area has an important and growing export base in expanding industries which lends stability to the fluctuations of the economy and provides an employment and income multiplier.

## RECOMMENDATIONS FOR FURTHER RESEARCH

Hopefully, this study has provided some new insights into the past growth and future tendencies of the Texas Gulf Coast area. However, because of its general nature, there are several areas of research which should be more fully developed and understood.

1. "Projections of the Changing Product Mix of the Gulf Coast Area." The changing life style of people seem certain to have a large effect upon the nature and rate of economic development in the coastal area in general and some of the presently less industrialized regions in particular. The type of goods and services produced in the area will change to meet the future wants of society; the impact is already being felt but the magnitude and direction of these trends need to be more fully understood.
2. "An Impact Analysis of the Tourism, Recreation, and/or Retirement Living to a Region Along the Coast." The amount of money received by a region from these different activities as well as the impact of increased spending from each of these activities to the region should be determined to suggest the types of development the region should try to encourage.
3. "The Potential of an Additional Federal Foreign Trade Zone in the Gulf Coast Area." Although a zone has been established in the McAllen area, the future impact has not been thoroughly evaluated with respect to the type of firms attracted, the nature of their operations, and products, the location of their raw materials and product markets, and the additional income provided to the region. Consideration for additional zones should be given to the present and future needs in other coastal regions.
4. "The Present Status and Future Implications of the Gulf Coast Region's Water Shortage to Regional Economic Development." The expanding consumption of water for municipal, industrial, and recreational purposes will have different consequences on different sectors of the region; the growth of certain industries may be severely hampered due to the scarcity of fresh water. These industries should be identified and the cost of water from various alternative sources should be determined to allow for future development of the region.

5. "A Flow Study of the Present Texas Gulf Coast Marine Transportation Network and Future Development."  
As the coastal area assumes a larger population, industrial base, and recreation-retirement facilities, the importance of the various Texas ports, the intracoastal waterway, and the need of additional facilities (such as a deep sea port facility) will change. The effects of these changes to the area should be identified and planned for to provide maximum regional benefits.

## APPENDIX A

CONFIDENTIAL

INDUSTRIAL ECONOMICS RESEARCH DIVISION

Questionnaire

1. Rank in numerical order the most important factors in your choice of a Texas Gulf Coast location:

- |                                       |                                      |                             |                       |
|---------------------------------------|--------------------------------------|-----------------------------|-----------------------|
| ___ good transportation               | ___ near product markets             | ___ near related industries | ___ land availability |
| ___ skilled labor supply              | ___ near raw materials               | ___ water supply            | ___ climate           |
| ___ unskilled labor supply            | ___ favorable tax structure          | ___ power supply            | ___ laws & regulation |
| ___ office & plant space availability | ___ recreation & cultural activities | ___ educational facilities  | ___ others _____      |

2. List the main disadvantages of your new Texas Gulf Coast location:

\_\_\_\_\_

Were you aware of these disadvantages when the site selection was made? \_\_\_\_\_

3. List the main products or services produced at the new facility. \_\_\_\_\_

\_\_\_\_\_

4. What percentage of the output of the new facility was sold:

a) in final form ready for use? \_\_\_\_\_ b) in semi-finished form needing further processing? \_\_\_\_\_

5. What percentage of (calendar or fiscal) 1969 gross revenue was derived from:

retail sales _____	sale of services _____
wholesale sales _____	sale of goods _____
100%	100%

6. What was the gross revenue for the new facility for 1969?

_____ \$0 - \$250,000	_____ \$500 - \$750,000	_____ \$1 - \$2,000,000	_____ \$5 - \$10,000,000
_____ \$250 - \$500,000	_____ \$750 - \$1,000,000	_____ \$2 - \$5,000,000	_____ over \$10,000,000

7. What is the average number of full-time equivalent employees? \_\_\_\_\_

8. What percentage of the labor force at your new location is:

\_\_\_\_\_ skilled \_\_\_\_\_ semi-skilled \_\_\_\_\_ unskilled

9. What percentage of the materials you handle are shipped the following distances?

<u>miles</u>	<u>materials (inputs)</u>	<u>product (output)</u>
0 - 100	_____	_____
100 - 500	_____	_____
500 - 1,000	_____	_____
more than 1,000	_____	_____
	100%	100%

10. What percentage of the goods you handle are shipped by the following carriers?

	<u>materials (inputs)</u>	<u>product (output)</u>
airlines	_____	_____
railroads	_____	_____
trucking firms	_____	_____
pipelines	_____	_____
water carriers	_____	_____
	100%	100%

11. Under conditions today, would you again choose the same site for your new facility? \_\_\_\_\_ If not, please comment \_\_\_\_\_

What was your second alternative site? \_\_\_\_\_

12. Was your location decision influenced by any financial aid, tax benefit, or other special consideration?

\_\_\_\_\_ If so, please comment \_\_\_\_\_

13. Please give general comments on the advantages and disadvantages of a Texas Gulf Coast location for your type business. \_\_\_\_\_

**APPENDIX B**



DATA FOR THE GOLDEN CRESCENT,  
LOWER RIO GRANDE VALLEY  
AND SOUTH EAST TEXAS REGIONS

COUNTY	EFFECTIVE 1969 BUYING INCOME PER CAPITA	1968 FARM INCOME \$000	MANUFAC- TURING VALDE \$000*	1967 MINERAL VALUE \$000	1968 ASSESSED TAX VALUE \$000	POPULATION		MEDIAN YEARS EDUCATION	1970 AGE DISTRIBUTION		PERCENT NON-WHITE	PERCENT SPANISH SURNAME	PERCENT URBAN RESIDENCES	
						1970	PERCENT CHANGE 1960-1970		UNDER 18	18-64 OVER 64				
<u>Golden Crescent Region</u>														
Lavaca	2,022	15,955	3,102	10,181	27,322	17,483	-13.3	7.6	33.8	50.6	15.6	10.5	4.6	30.4
Jackson	2,382	18,471	1,277	59,804	72,736	12,597	-10.3	8.6	41.4	50.6	8.0	12.1	13.7	35.9
DeWitt	2,148	14,727	4,023	14,561	39,537	17,872	-13.6	7.9	35.7	50.4	14.0	13.5	18.9	39.5
Victoria	2,549	11,327	52,944	26,330	91,516	52,776	+13.6	9.4	41.8	52.1	6.1	8.6	23.2	71.1
Goliad	2,091	6,200	D	12,647	23,245	4,580	-15.6	7.6	36.7	51.1	12.2	11.6	35.0	0
Calhoun	2,795	6,133	72,254	22,314	85,865	17,052	+ 2.8	9.9	45.5	50.5	4.0	5.0	25.1	53.4
Total or Average	2,415	72,254	133,600	145,837	340,221	122,360	- 0.8	8.8	40.0	51.3	8.7	9.5	19.1	52.0
<u>Lower Rio Grande Valley Region</u>														
Cameron	1,805	35,832	45,463	1,408	183,030	137,506	- 9.0	7.9	46.3	48.4	5.4	0.8	64.0	77.0
Willacy	1,559	19,776	2,617	12,888	40,761	15,432	-23.2	6.1	48.9	45.9	5.2	0.5	66.1	46.7
Hidalgo	1,513	77,447	26,911	38,511	200,431	172,469	- 4.7	6.3	47.5	47.0	5.5	00.4	71.3	71.2
Total or Average	1,638	133,055	74,991	52,807	424,222	325,407	- 7.0	7.3	47.1	47.5	5.4	0.6	67.8	72.5
<u>South East Texas Region</u>														
Orange	2,335	2,417	189,142	13,101	117,368	70,380	+16.6	10.4	41.7	53.8	4.5	1.0	2.1	66.4
Jefferson	2,949	22,174	728,117	78,838	455,165	242,719	- 1.2	10.9	37.9	56.0	6.1	23.4	2.7	95.9
Total or Average	2,811	24,591	917,259	91,939	572,533	313,099	+ 2.3	10.8	38.7	55.5	5.8	20.4	2.6	89.3

D Disclosure not permitted due to small number of firms.

\* 3 year average of 1965-1967

SOURCE: Texas Almanac, Annual Report of the Comptroller of Public Accounts for the State of Texas, 1970 Census of Population, Texas, Advanced Report, 1960 Census of Population, City and County Data Book, 1967. The 1969 effective buying income data is from the 1970 Sales Management Survey of Buying Power (c); further reproduction is forbidden.

**APPENDIX C**

DATA FOR THE GULF COAST REGION

COUNTY	EFFECTIVE 1969 BUYING POWER PER CAPITA \$000	1968 FARM INCOME \$000	MANUFACTURING VALUE \$000*	1967 MINERAL VALUE \$000	1968 ASSESSED TAX VALUE \$000	POPULATION		MEDIAN YEARS EDUCATION	1970 AGE DISTRIBUTION		PERCENT NON-WHITE	PERCENT SPANISH SURNAME	PERCENT URBAN RESIDENTS	
						1970	PERCENT CHANGE 1960-1970		UNDER 18	18-64 OVER 64				
Fort Bend	1,996	23,223	35,186	47,970	88,365	51,410	+26.9	7.7	40.7	52.3	7.0	20.1	24.6	39.9
Brazoria	2,513	26,915	317,398	214,036	326,976	106,230	+30.4	10.6	30.9	55.2	4.9	12.0	6.8	58.7
Austin	2,091	12,698	695	6,839	31,753	13,243	- 3.9	7.7	31.3	52.0	16.1	21.5	1.7	0
Walker	2,217	6,676	1,857	148	24,114	24,885	+15.9	8.5	24.5	66.3	9.2	32.8	2.7	55.9
Montgomery	1,593	4,849	12,755	33,880	77,730	46,850	+74.9	8.9	38.4	51.4	10.2	22.9	1.5	34.2
Liberty	2,285	16,810	3,944	42,516	87,267	30,565	- 3.3	8.6	39.6	51.7	8.7	23.5	.8	48.5
Waller	2,228	11,953	131	37,943	46,174	13,965	+15.7	9.3	32.7	56.9	10.4	53.7	2.7	0
Colorado	2,397	23,995	2,063	44,827	58,315	17,155	- 7.1	8.2	37.3	50.6	12.1	24.9	6.4	39.1
Wharton	2,264	41,058	8,191	94,897	79,296	36,234	- 5.0	8.2	40.5	50.5	9.0	20.5	14.8	35.2
Matagorda	2,566	24,496	16,262	60,638	99,075	27,630	+ 7.3	9.0	40.7	50.9	8.5	20.7	13.9	59.6
Harris	2,903	29,806	1,942,962	121,186	2,602,152	1,722,533	+38.6	11.3	38.3	56.3	5.4	20.1	6.0	94.5
Chambers	2,633	18,646	429	87,776	70,237	12,010	+15.7	9.0	39.8	53.3	6.9	22.1	1.8	0
Galveston	2,463	6,425	303,433	57,142	383,542	165,669	+18.0	10.3	38.0	55.6	6.4	21.4	8.5	89.6
Total or Average	2,761	247,555	2,645,306	849,798	3,974,996	2,268,379	+33.5	10.0	37.3	56.1	6.6	20.3	6.7	85.5

D Disclosure not permitted due to small number of firms

\* 3 year average of 1965-1967

SOURCE: Texas Almanac, Annual Report of the Comptroller of Public Accounts for the State of Texas, 1970 Census of Population, Texas, Advanced Report, 1960 Census of Population, City and County Data Book, 1967. The 1969 effective buying income data is from the 1970 Sales Management Survey of Buying Power (C); further reproduction is forbidden.

**APPENDIX D**

DATA FOR THE COASTAL BEND REGION

COUNTY	EFFECTIVE 1969 1969 BUYING FARM INCOME PER CAPITA	1968 FARM INCOME \$800	MANUFAC- TURING VALUJE \$000*	1967 MINERAL VALUJE \$800	1968 ASSTSSD TAX VALUJE \$000	POPULATION		MEDIAN YEARS EDUCATION	1970 AGE DISTRIBUTION		PERCENT NON-WHITE	PERCENT SPANISH SURNAME	PERCENT URBAN RESIDENCES	
						1970	PERCENT CHANGE 1960-1970		UNDER 18	18-64 OVER 64				
McMillen	3,626	7,775	0	9,774	13,719	1,049	- 6.0	11.0	36.7	52.6	10.7	0	28.14	0
Live Oak	2,363	7,775	1,620	23,881	25,649	6,308	-19.6	8.2	42.8	48.6	8.6	0.2	34.2	0
Bee	2,338	7,929	1,054	25,066	49,605	22,161	- 6.7	9.1	42.0	51.9	6.1	2.7	36.6	58.1
Refugio	2,533	7,401	56	90,706	89,935	9,089	-17.2	8.9	42.7	50.7	6.6	9.4	31.7	45.0
Aranzas	2,562	389	945	11,717	30,711	8,468	+20.9	9.3	38.3	52.3	9.4	4.1	19.8	56.0
San Patricio	1,825	20,018	54,104	50,483	108,182	44,445	- 1.3	8.1	47.0	47.6	5.4	1.9	49.4	60.3
Duval	1,994	6,877	579	39,451	106,753	11,364	-15.2	6.9	42.6	50.4	7.0	0.1	73.1	48.3
Jim Wells	2,254	13,783	1,429	88,963	81,580	32,100	- 7.1	8.2	45.2	49.7	5.1	1.1	54.6	71.0
Nueces	2,392	21,794	174,944	94,378	37,220	233,965	+ 5.6	10.1	43.6	51.8	4.6	4.7	38.1	88.7
Kleberg	2,135	7,357	1,074	127,445	115,293	32,172	+ 7.1	9.7	40.0	55.6	4.5	3.8	41.6	84.2
Brookes	1,974	7,200	143	40,593	69,412	7,731	-10.2	7.1	44.1	49.9	6.0	0.1	68.9	0.1
Kenedy	1,781	3,322	0	12,794	13,692	665	-24.8	4.2	45.5	49.2	5.3	0	80.5	0
Total or Average	2,286	107,471	2,444,281	548,113	741,751	409,517	+1.17	9.4	43.5	51.4	5.1	3.7	42.2	76.0

D Disclosure not permitted due to small number of firms

\* 3 year average of 1965-1967

SOURCE: Texas Almanac, Annual Report of the Comptroller of Public Accounts for the State of Texas, 1970 Census of Population, Texas, Advanced Report, 1960 Census of Population, City and County Data Book, 1967. The 1969 effective buying income data is from the 1970 Sales Management Survey of Buying Power (GI); further reproduction is forbidden.

