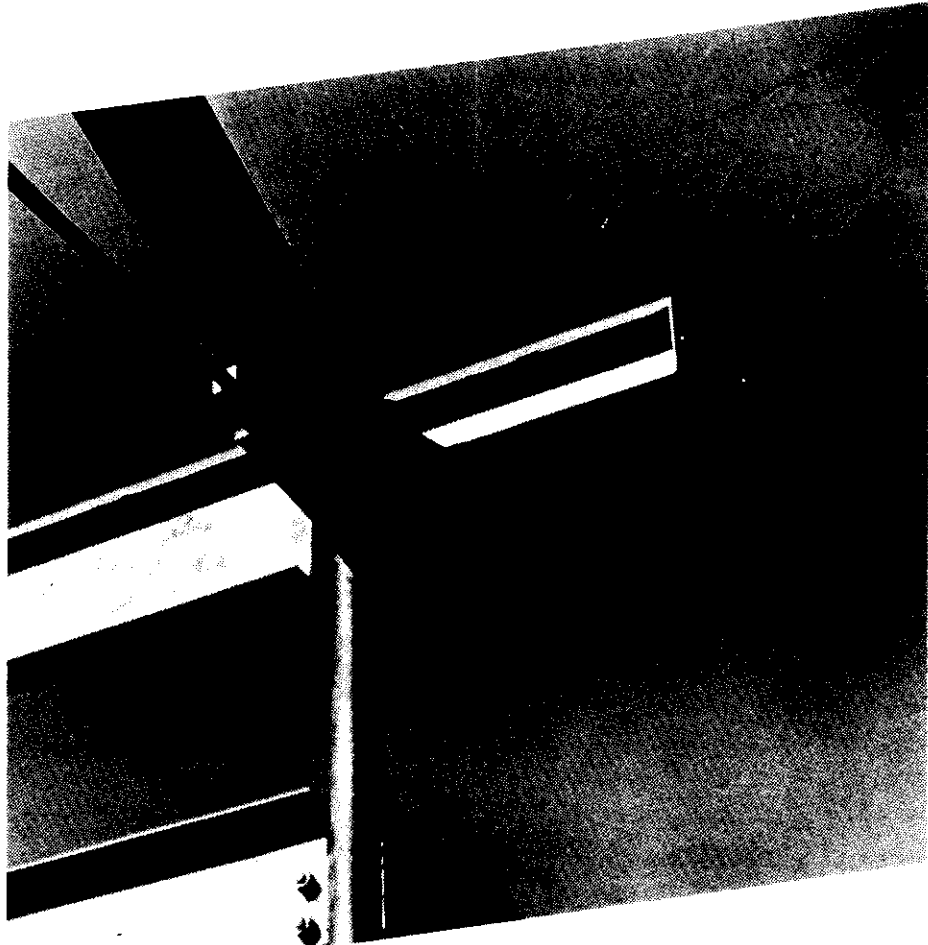


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The Impact of the Florida Construction Industry on the State Economy



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1987



THE IMPACT
OF THE
FLORIDA CONSTRUCTION INDUSTRY
ON THE
STATE ECONOMY

FOR PRESENTATION TO THE
BUILDING CONSTRUCTION INDUSTRY ADVISORY COMMITTEE

BY
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SCHOOL OF BUILDING CONSTRUCTION
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SUMMARY
THE IMPACT OF THE FLORIDA
CONSTRUCTION INDUSTRY ON THE STATE ECONOMY
(an update)

As the title of this publication indicates many aspects of the construction industry and the economy of Florida are explored.

The following are the main points of the report:

1. All Florida economic indicators, and population have shown growth since 1970, with periods of slow or no growth shown only in the recessions of 74-76 and 81-82. Table 1-1.
2. Employment directly in construction accounted for 7.5% of total employment in 1985. Figure 1-4. This is more than twice the employment in Agriculture, Forestry, and Fisheries. Construction employment is greater than employment in Transportation, Communication, and Public Utilities. It is greater than employment in Government (public administration, excluding government services). It is greater than employment in Wholesale trade. It is greater than employment in Finance, Insurance and Real Estate. It is only surpassed by Services; by Retail trade; and by Manufacturing.
3. Employment in construction is more volatile than that in other industry sectors. Figure 2-2.
4. Mining is approximately 34% construction related. Tables 2-2 and 2-3. Florida ranks 4th in the U.S in non-fuel mineral production. p.16
5. Approximately 12% of employment in manufacturing is construction related. p.18
6. Approximately 5% of wholesale and retail trade is construction related. p.20
7. Shares of Finance, insurance, real estate; Services; and Government are also construction related. Forestry (tree farming) is significantly construction related.
8. The shortfall in sales tax revenues in the 74-76 recession can be accounted for in the loss of tax revenue from the depressed construction industry. A similar short fall was avoided in 81-82 by a 25% increase in the sales tax rate. Figures 2-10 and 2-11.

9. Nationwide, employment in construction has risen less than 1% from 1977 to 1982. p.48 In the same time period in Florida it has risen 48%. p.32, Table 2-1.
10. Single family housing is one of the more volatile subsectors of the construction industry being largely tied to the availability and cost of money. Figures 3-3, 3-4, 3-5. pp.54-56
11. Residential contractors are more numerous in the counties along the I-4 corridor and on the Gold Coast. Map 3-1. p.58
12. Florida had 4 areas in the nations top 20 housing markets in 1986: Tampa-St. Petersburg, West Palm Beach/Boca Raton, Orlando, and Ft. Lauderdale/Hollywood. p.59
13. General contractors are most numerous in the Gold Coast counties, the Tampa bay area, the Pensacola area, and Duval. Map 3-2. p.64
14. Plumbing and Mechanical, Electrical, and Roofing contractors are concentrated in Duval, Pinellas, Hillsborough, Palm Beach, Broward, and Dade counties. Map 3-4, 3-5, and 3-6.
15. Distribution of contractor licenses by type and county is shown in Table 3-5, pp.85-88
16. 1982 Employment, Total receipts, Value added, and Net receipts information for the various construction subsectors is summarized in Table 3-6, p.89
17. Pinellas, Hillsborough and Polk counties lead in mobile home licenses for 84-85. Map 3-7. p.82
18. The output multiplier resulting from the RIMS II Input-Output analysis indicates that an increase of \$1000 in new construction output generates \$1,110 in additional output to other sectors, generates \$708 in income, and provides for .0433 jobs. p.109 & Fig. 5-1
19. The output multiplier resulting from the RIMS II Input-Output analysis indicates that an increase of \$1000 in maintenance and repair construction generates \$1,037 in additional output to other sectors, generates \$789 in income, and provides for .0477 jobs. Figure 5-1 p.110

The overall impact of the construction industry on the economy in Florida is ENORMOUS. For further summary information please read Chapter 6, pgs 120-124.

PREFACE

This publication is the result of research performed by Professor G. Arlan Toy and Graduate assistant Steve Howell in updating the previous report, Technical Publication No. 30, A study of the total impact on Florida's economy of the construction industry. It was funded by the Florida Department of Education on the recommendation of the Building Construction Industry Advisory Committee, DOE contract # 087-084.

Every effort was made to update as much of the previously reported information as possible. New updated information through 1986 has been included for population by county, gross sales, total employment, construction employment by county, state and local taxes affecting the construction industry, that portion of employment in mining, building materials, and other industries that is construction related, building permits by project type, housing starts for both single-family and multi-family construction, and a reporting of those housing markets in Florida that were among the top twenty markets nationally in terms of housing starts.

Information in this report that is now updated to the most current data available include the final 1982 U.S. Census of Construction data for employment, total receipts, value added, and net receipts for both the state by contractor type and the U.S. as a whole, the dollar value of construction contracts through 1984, and new mobile home data for starts and shipments

during the 1981 to 1983 period.

Very little information has not been updated since the previous report and is primarily limited to data for state sales/use tax, sales tax from lumber, builders and contractors, and the dollar value of loans for single-family and multifamily housing.

Some data has been updated to account for discrepancies in the previous report. Personal income for 1983 was previously reported as \$495 billion and should have been shown as \$130 billion for that year. Personal income for 1986 now stands at \$166 billion. Figure 2-6 of the previous report has now been corrected to show a comparison of construction versus manufacturing employment instead of an earnings comparison. Figure 2-13 was previously omitted and is now included to show the annual percent change in construction related employment.

Some of the more noteworthy changes that have occurred since the last report include the increase in constructions share of total employment from 7.0% to 7.5%, the increase in construction related mining from 30.0% to 38.0%, the increase in construction related manufacturing from 11.8% to 12.4%, the increase in construction related wholesale/retail trade from 4.9% to 5.0%, and the increase in Florida tree farm acreage from 7.3% to 7.8% of the U.S. total. The final U.S. Census of Construction data for 1982 indicated that the percent increase in U.S. construction employment was less than 1.0%. The preliminary census report had indicated this percent increase to be about 3.0%. Floor laying

contractors in Florida were reported as having a 3.1% employment increase in the final 1982 census report. The preliminary report had shown a slight decrease in employment for these contractors.

INTRODUCTION

Few of Florida's citizens realize the impact that the construction industry has on the economy of the state. It is the purpose of this report to document the many ways that the construction industry is interrelated with other areas of Florida's economy. Data from a number of sources have been brought together in this report for the purpose of making them readily available to all interested parties. The original research as well as this update was funded under the provisions of Chapter 489.109 Florida Statutes and under the supervision of the Florida Building Construction Industry Advisory Committee.

New updated information has been included in most sections of this report. Some information was previously reported in the 1982 Census Preliminary Report and is now presented in final form for 1982. Other data concerning housing, population, employment, and licensed contractors has been updated to include the most current information available. In addition, a newly expanded input-output model is presented showing the impact of each subsector of the construction industry on the employment, earnings and output of all other sectors of the Florida economy.

This update report is organized as follows: Chapter 1 demonstrates the rapid growth of the state of Florida using such indicators as population, employment figures, personal income, and gross sales. The importance of the construction industry in these figures is discussed.

Chapter 2 details the importance of the construction

industry in the Florida economy. In addition to construction's direct effect on the economy, the industry's impact on other industries, such as mining; wholesale and retail trade; finance, insurance, and real estate; and forestry is documented. The contribution of the construction industry to Florida's tax base is also detailed.

Chapter 3 divides the construction industry into several subsectors for further discussion. The impact of the construction industry on mining is considered. Data are presented on employment, total receipts, and value added for the years 1977 and 1982 for 10 major categories and 19 additional subcategories of the construction industry, as defined by the U.S. Census. The census categorizes by type of business rather than by type of construction. These figures document the growth of the construction industry. Net receipts for 1982 are listed in actual dollar amounts to demonstrate the importance of construction. The distribution of licensed contractors in many of the categories is presented to demonstrate local impact of the construction industry in Florida counties. The mobile home industry in Florida is also discussed.

Chapter 4 introduces Input-Output analysis, a technique to describe economic interrelationships between industries. After discussing the techniques and goals of input-output analysis, the chapter proceeds to focus on the limiting assumptions of input-output analysis and a discussion of multipliers generated by input-output models.

Chapter 5 describes the results of the Regional Input-Output Modeling System (RIMS II) economic impact analysis. Through the use of three case examples, the importance of construction industry subsectors can be seen in the calculated impacts on other segments of Florida's economy.

Finally, Chapter 6 summarizes the results of the analysis of the impact that the construction industry has on the Florida economy.

Appendices A, B, C, and D are used with the RIMS II input-output modeling presented in Chapter 5.

CHAPTER 1.
FLORIDA GROWTH

I. GROWTH INDICATORS

Florida is a growth state. Table 1-1 shows general growth trends since 1970. Florida population has grown 70%; gross sales have grown 510%; non-agricultural employment has grown 107%; and total state personal income has grown 518%.

A general increase in mobility, a decrease in the workweek, and an increase in the standard of living, have greatly increased leisure time activities which has led to increased tourism in and retirement to Florida.

According to a July 1982 questionnaire, the top five reasons people visit Florida are; the climate, the rest and relaxation, visiting friends and relatives, Florida attractions, and the beaches.² People want to live here for the same reasons.

II. POPULATION TRENDS

Figure 1-1 shows Florida population growth since 1970. Migration into Florida has typically been the highest in the retirement age group. Individuals in this group have ended their career ties with their previous geographic area and are financially independent enough to make the move to Florida. Other age groups have also been increasing in size in Florida.

Industry has been moving to Florida bringing with it the need for a larger workforce. Florida also has lower overall taxes than most of the states from which our new residents move.

FLORIDA POPULATION GROWTH 1970 - 1986

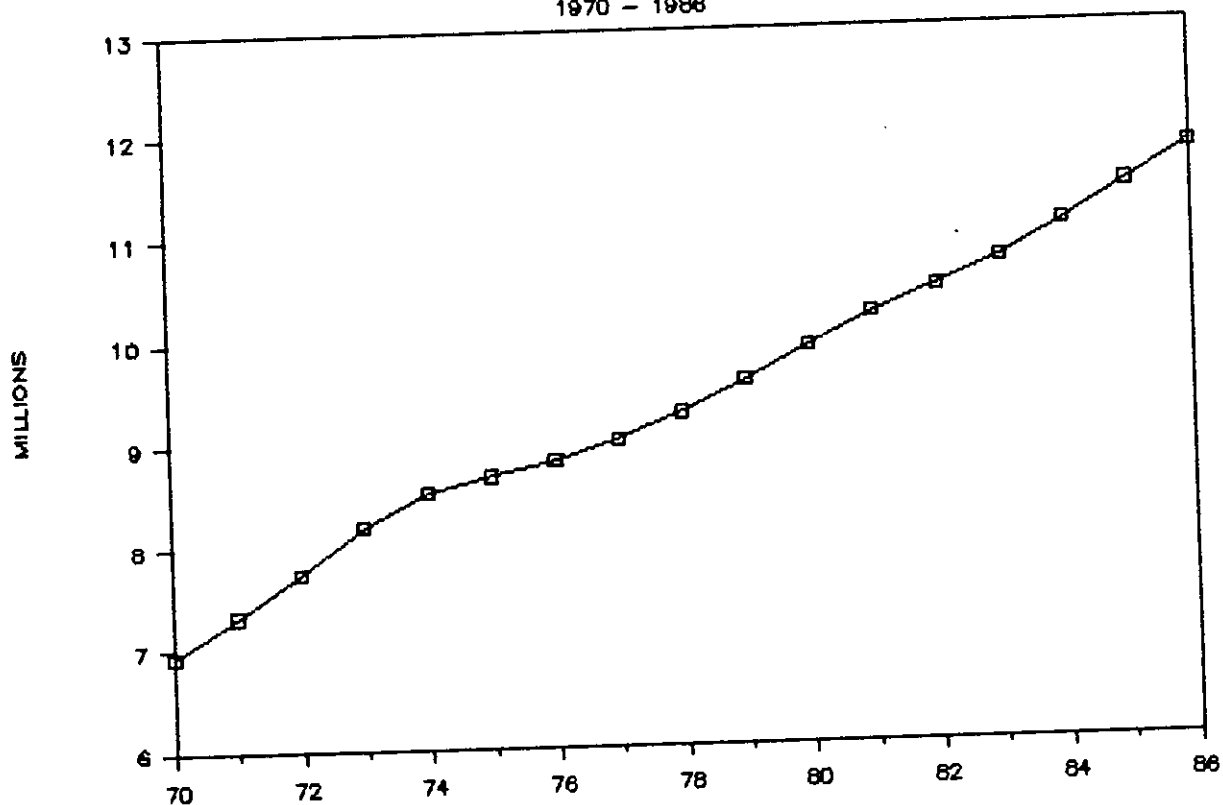


FIGURE 1-1

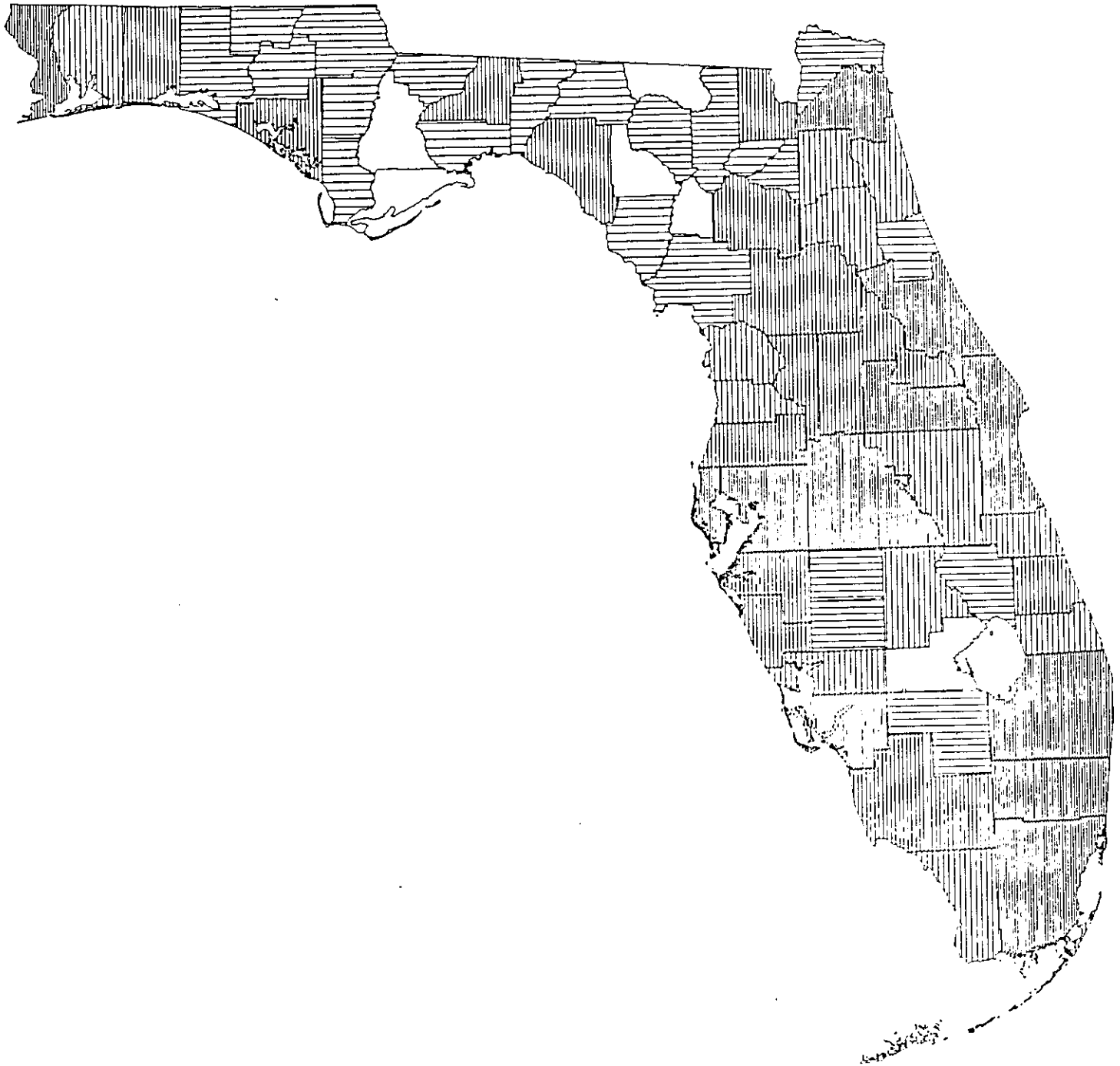
Another look at population growth Figure 1-1 finds a slower growth rate during the years 1974 through 1976. Population growth in Florida is affected by the general economic picture. The U.S. was in a recession during this period. People were less inclined to make a change.

Map 1-1 shows the population distribution in the State. The high density areas are the "Gold Coast" of Southeast Florida, the

MAP 1-1

ESTIMATED 1986 POPULATION
POPULATION

4



POPULATION

LESS THAN 10000
50000 TO 99999

10000 TO 19999
100000 TO 249900

20000 TO 49999
250000 AND UP

"I-4 Corridor" of Central Florida, Jacksonville in Northeast Florida, and Escambia county in West Florida.

III. SALES

The consumer price index rose 182% from 1970 through 1986. During the corresponding period, gross sales in Florida rose 510%.⁵ Figure 1-2 shows this increase graphically. Note the periods of slow or no growth, 1974-76 and 1981-82. There has, however, been substantial 'REAL' economic growth in Florida in the last seventeen years.

GROSS SALES
1970 - 1986

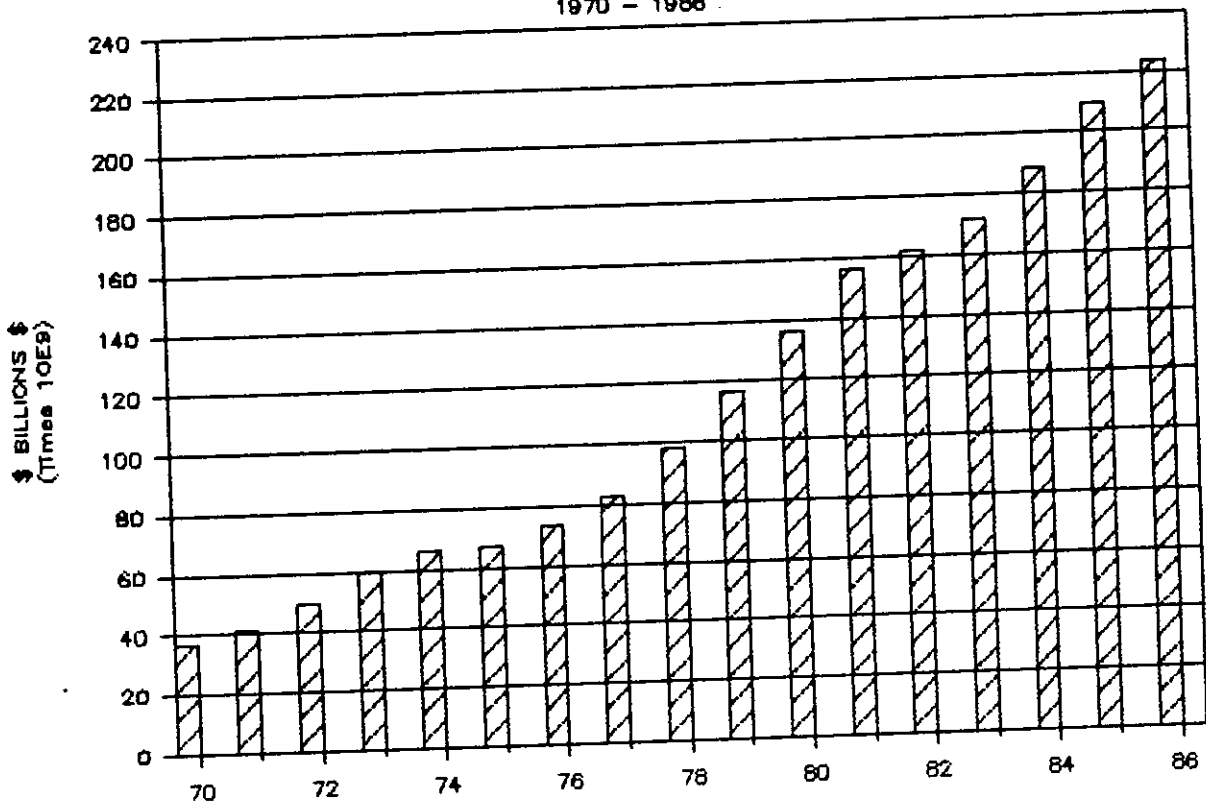


FIGURE 1-2

IV. EMPLOYMENT & PERSONAL INCOME

Total non-agricultural employment in Florida has grown from 2,155,000 in 1970 to 4,457,000 in 1986, an increase of 107%.⁶ Figure 1-3 shows the growth in non-agricultural employment for the State. Note the decline in employment for 1974-76 and the level employment for 1981-82.

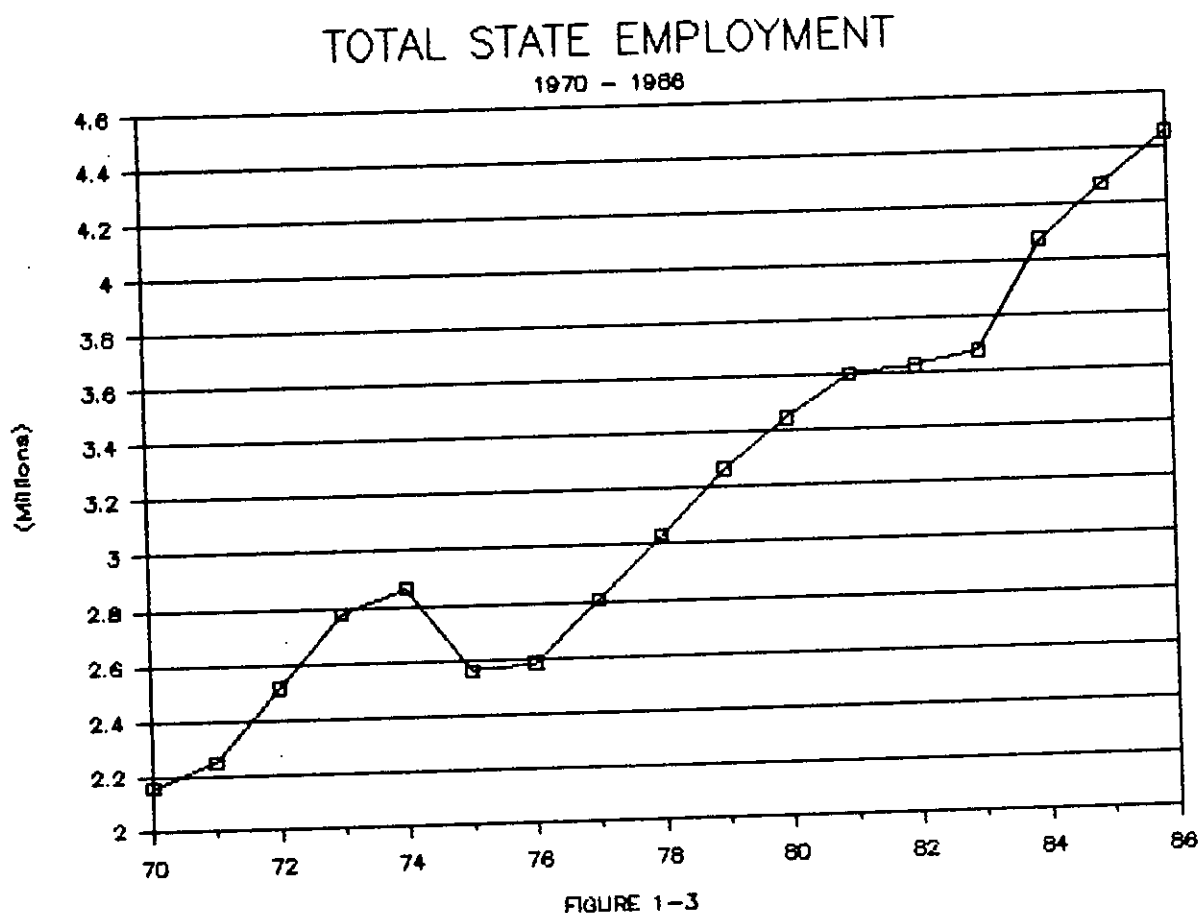
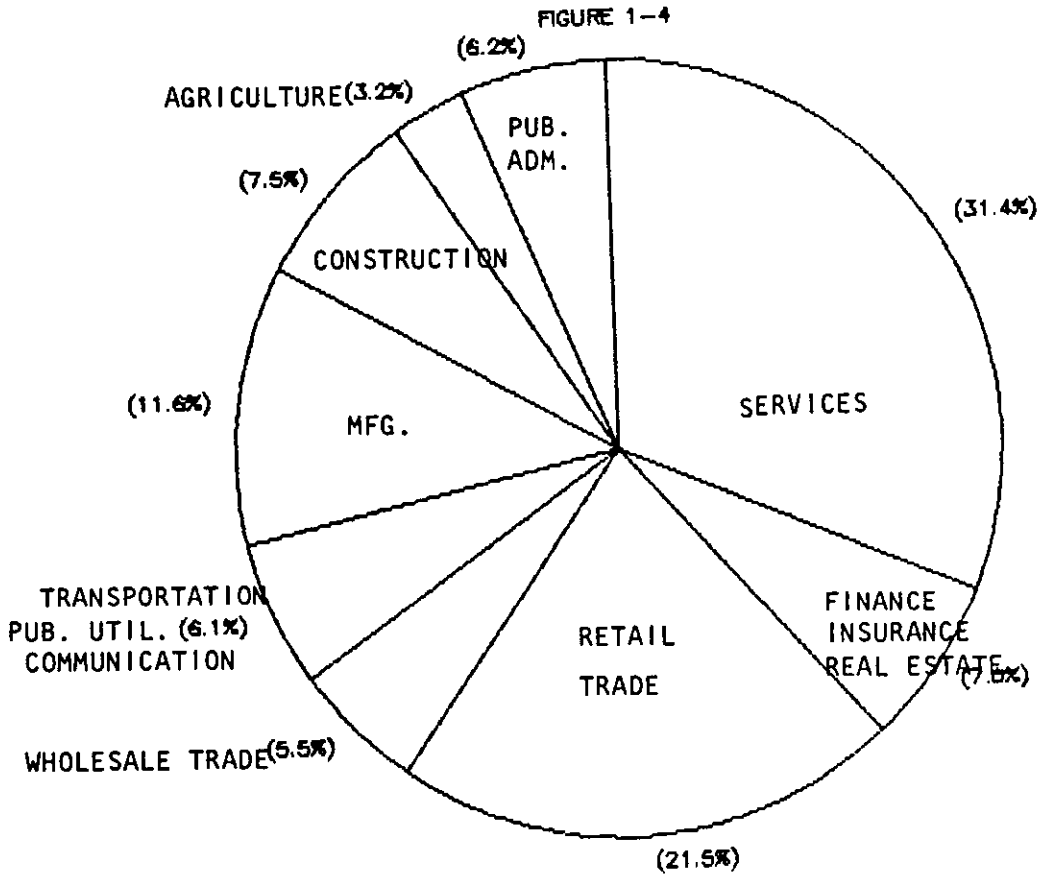


Figure 1-4 shows the distribution of employment in the State for March 1985. Construction accounts directly for 7.5% of total employment. Services include some governmental services

including educational and social services. Table 1-2, at the end of the chapter, gives the actual employment numbers and percents.

INDUSTRY EMPLOYMENT - March 1985



Total personal income reached over \$166 billion in 1986.¹⁰ Figure 1-5 shows total personal income. There has been a steady increase in personal income since 1970. The 1974-76 and 1981-82 periods shows only a slowing in the rate of growth.

TOTAL PERSONAL INCOME

1970 - 1986

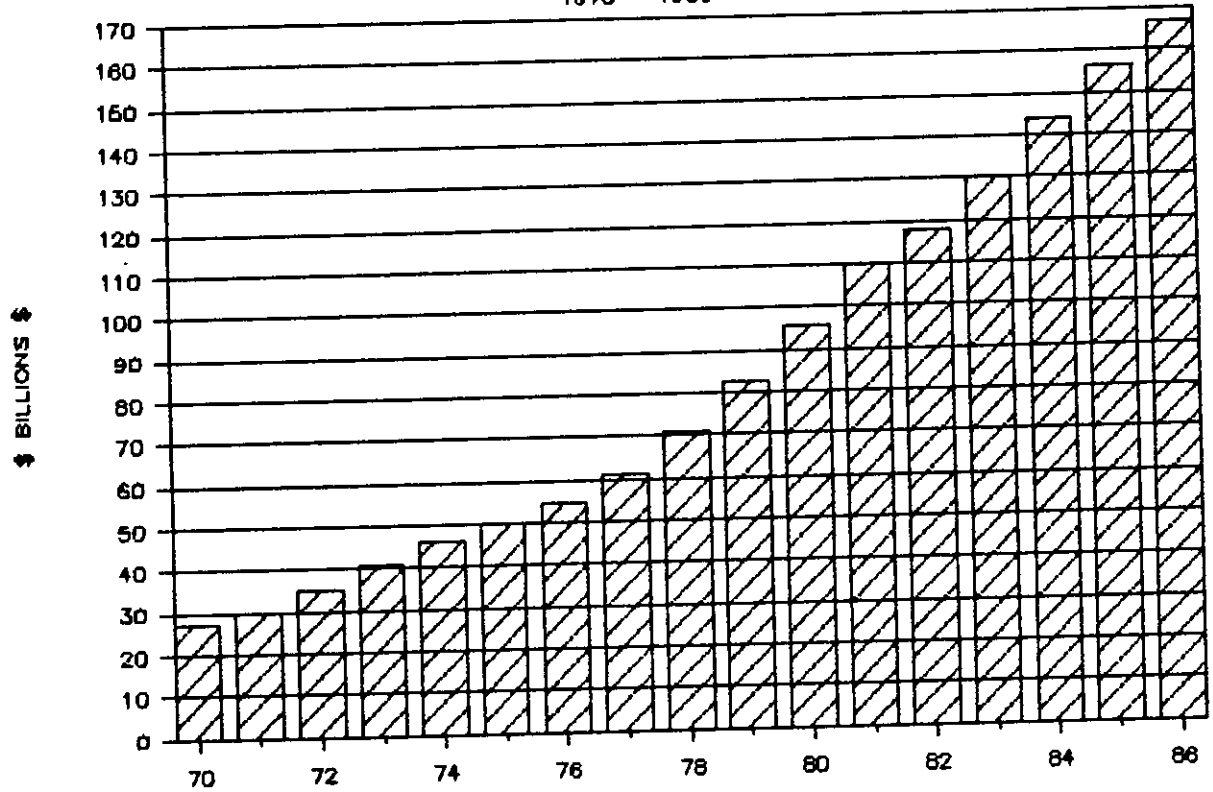


FIGURE 1-5

TABLE 1-1

**GENERAL FLORIDA TRENDS
WITH YEAR TO YEAR % CHANGE**

YEAR	POPULATION		GROSS SALES		NON-AGRICUL. EMPLOYMENT		PERSONAL INCOME	
	(000)s	%CHG	(\$MIL)	%CHG	(000)	%CHG	(MIL)	%CHG-
1970	6936		36619		2155		26968	
1971	7323	5.58	41131	12.32	2248	4.31	30207	12.01
1972	7743	5.74	49021	19.18	2513	11.77	34786	15.16
1973	8195	5.83	59278	20.92	2779	10.56	40837	17.40
1974	8515	3.90	65902	11.17	2864	3.06	45981	12.60
1975	8665	1.76	66806	1.37	2557	-10.69	49755	8.20
1976	8809	1.66	73778	10.43	2580	0.88	54539	9.62
1977	9006	2.24	82691	12.08	2803	8.65	61284	12.36
1978	9262	2.84	98150	18.69	3033	8.20	71265	16.28
1979	9558	3.19	116449	18.64	3268	7.74	82406	15.63
1980	9882	3.4	136207	16.97	3449	5.54	95941	16.42
1981	10208	3.29	156504	14.90	3605	4.52	110175	14.83
1982	10450	2.37	161671	3.30	3630	0.70	118185	7.27
1983	10717	2.55	171625	18.64	3680	4.15	130471	10.39
1984	11060	3.21	188233	9.67	4075	7.80	143983	10.35
1985	11426	3.31	209956	11.54	4275	4.91	156184	8.47
1986	11800	3.27	223582	6.48	4457	4.25	166720	6.74
====	=====		=====		=====		=====	

TABLE 1-2

**INDUSTRY EMPLOYMENT; BASED ON
EMPLOYMENT COVERED BY UNEMPLOYMENT
COMPENSATION LAW, MARCH 1985**

SIC CODE	INDUSTRY	EMPLOYMENT	PERCENT
01-09	AGRICULTURE, FORESTRY & FISHING	140040	3.14
10-14	MINING	10350	0.23
15-17	CONSTRUCTION	335229	7.51
20-39	MANUFACTURING	515257	11.55
40-49	TRANSP., COMMUNICATION., PUB. UTILITIES	272172	6.10
50-51	WHOLESALE TRADE	245244	5.50
52-59	RETAIL TRADE	953888	21.39
60-69	FINANCE, INSURANCE AND REAL ESTATE	311177	6.97
70-89	SERVICES	1396612	30.72
90-97	GOVERNMENT	274518	6.15
99	NON-CLASSIFIABLE ESTABLISHMENTS	3715	.08
	TOTAL EMPLOYMENT	4458202	100.00

Notes to Chapter 1

1. Bureau of Economic and Business Research (BEBR), The BEBR Computerized Data Base, (Gainesville: Northeast Regional Data Center, University of Florida, 1986), Files FNA, GSALESNS, TENAGENS, YF.
2. Anne H. Shoemyen, ed. 1986, Florida Statistical Abstract (Gainesville: University Presses of Florida, 1986), 477.
3. BEBR, Computerized Data Base, File, FNA.
4. Ibid., File CNN.
5. Ibid., File GSALESNS.
6. Ibid., File TENAGFNS.
7. Ibid.
8. Shoemyen, Florida Statistical Abstract, 176.
9. Ibid.
10. BEBR, Computerized Data Base, File YF.
11. Ibid.

CHAPTER 2.

CONSTRUCTION AND THE FLORIDA ECONOMY

I. CONTRACT CONSTRUCTION

The major industry divisions shown in Table 1-2 comprise the economy of Florida. Among these divisions is one which is wholly construction, "Contract Construction". It is the most volatile of the economic divisions. Figure 2-1 shows employment in this division from 1970.

EMPLOYMENT IN CONSTRUCTION

1970 - 1986

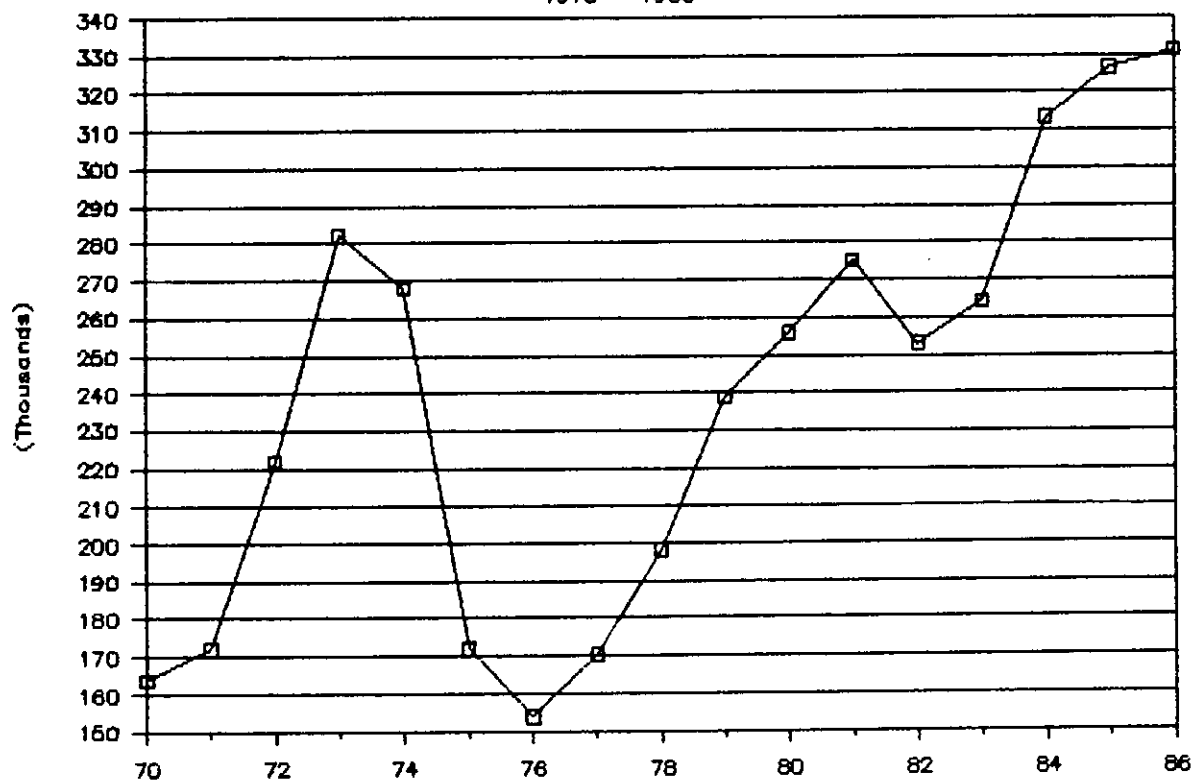


FIGURE 2-1

It is easy to see from the recession periods, 1974-76 and

1981-82, how economic factors have a magnified effect on the construction industry. Figure 2-2 shows how construction division employment changes compare with total employment changes. Total employment fluctuates in a narrow range of -10 to +12% from the previous year whereas construction employment fluctuates widely from -36% to +29%. The actual figures are shown in Table 2-1.

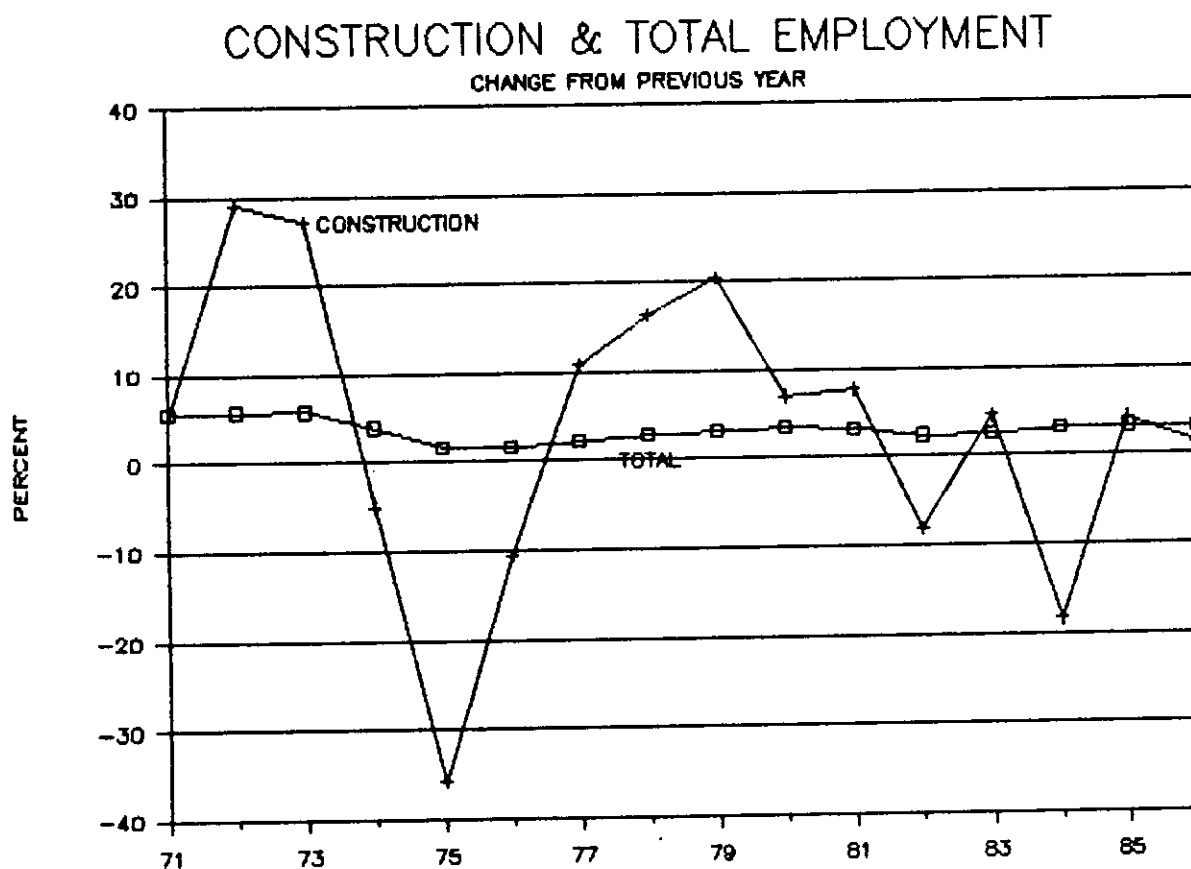
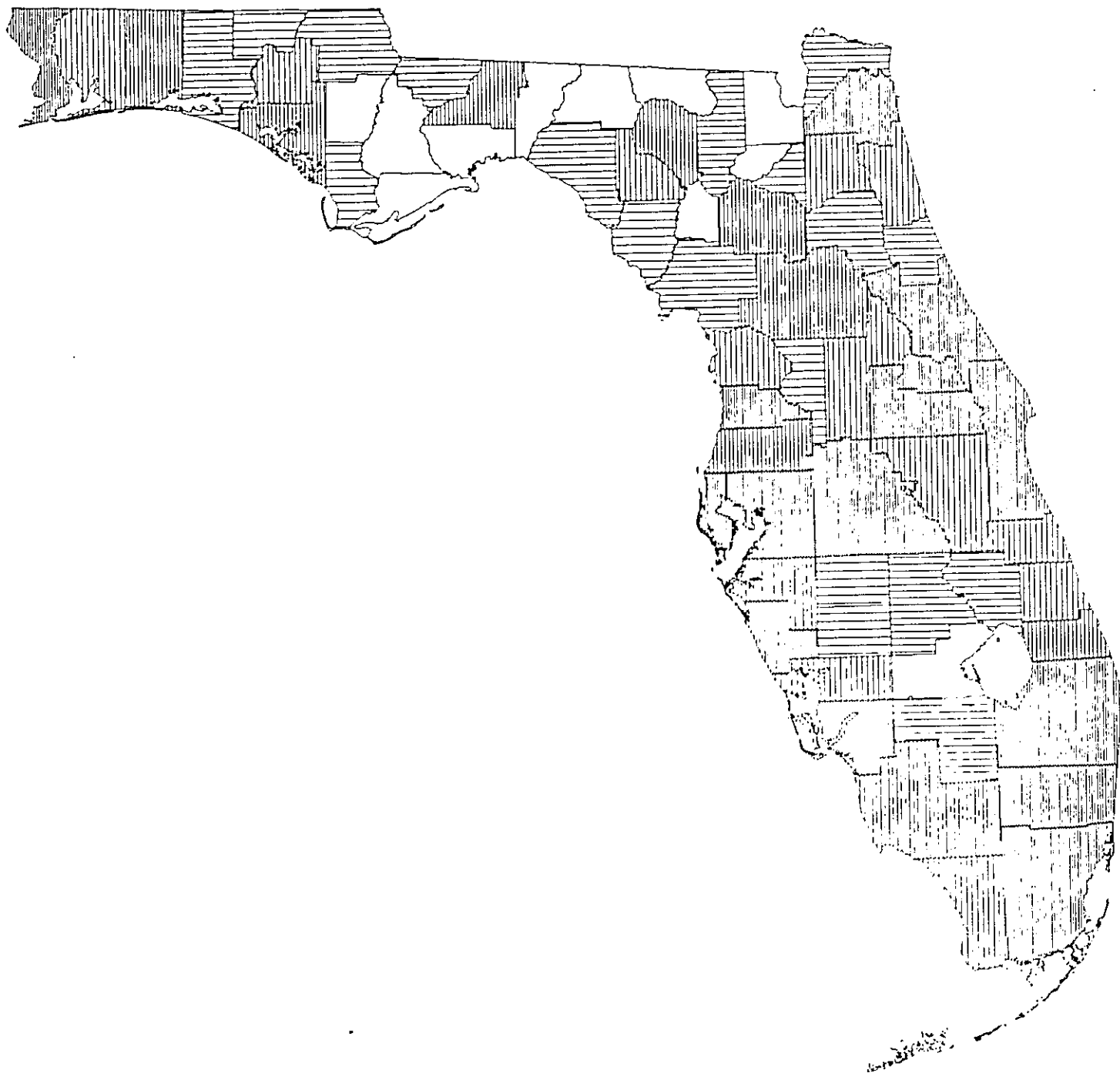


FIGURE 2-2

Contract construction employment distribution throughout the State for 1984 is shown by Map 2-1. Dade county led with 38,304 followed by Broward county with 33,376. Next came Hillsborough

MAP 2-1

CONTRACT CONSTRUCTION EMPLOYMENT ⁴



EMPLOYEES

LESS THAN 75
1000 TO 2999

75 TO 249
3000 TO 4999

250 TO 999
5000 AND UP

(27,869), Palm beach (25,346), Pinellas (23,014), and Orange (22,264).⁵

II. CONSTRUCTION ASPECTS OF OTHER INDUSTRY DIVISIONS

MINING & MANUFACTURING

Florida ranks 4th in the United States in non-fuel mineral production, following Arizona, Minnesota, and California. In 1984 Florida production accounted for 6.52% of total U.S. production.⁶

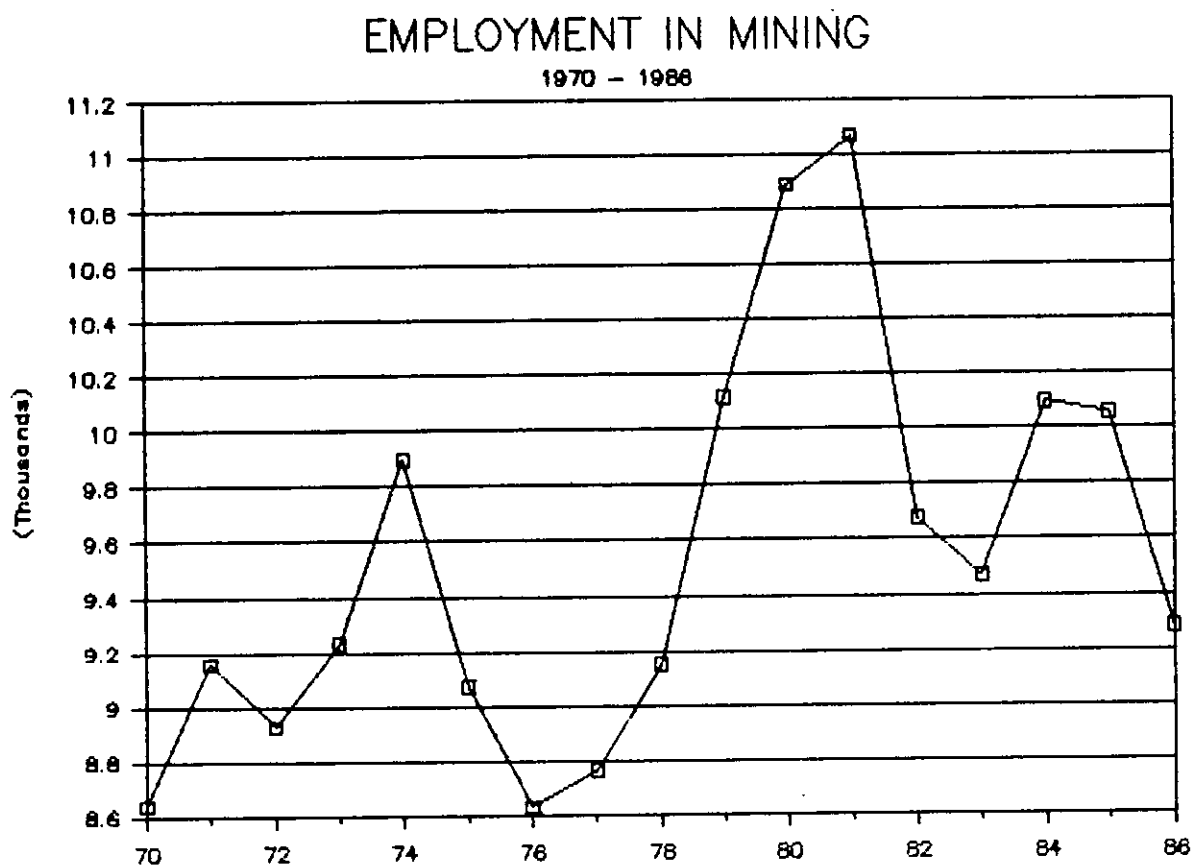


FIGURE 2-3

A very large portion of mining in Florida is construction related. Tables 2-2 and 2-3 show employment in mining and value of construction related mineral production. From these tables it seems that approximately 37% of mining is construction related.

Figure 2-3 shows the trend in mining employment since 1970. The matching tabular numbers are in Table 2-1. Employment has fluctuated between 8,630 and 11,070. Figure 2-4 is the yearly percent change graph for mining employment. A comparison of this with the construction line in Figure 2-2 will show mining employment to be much more stable.

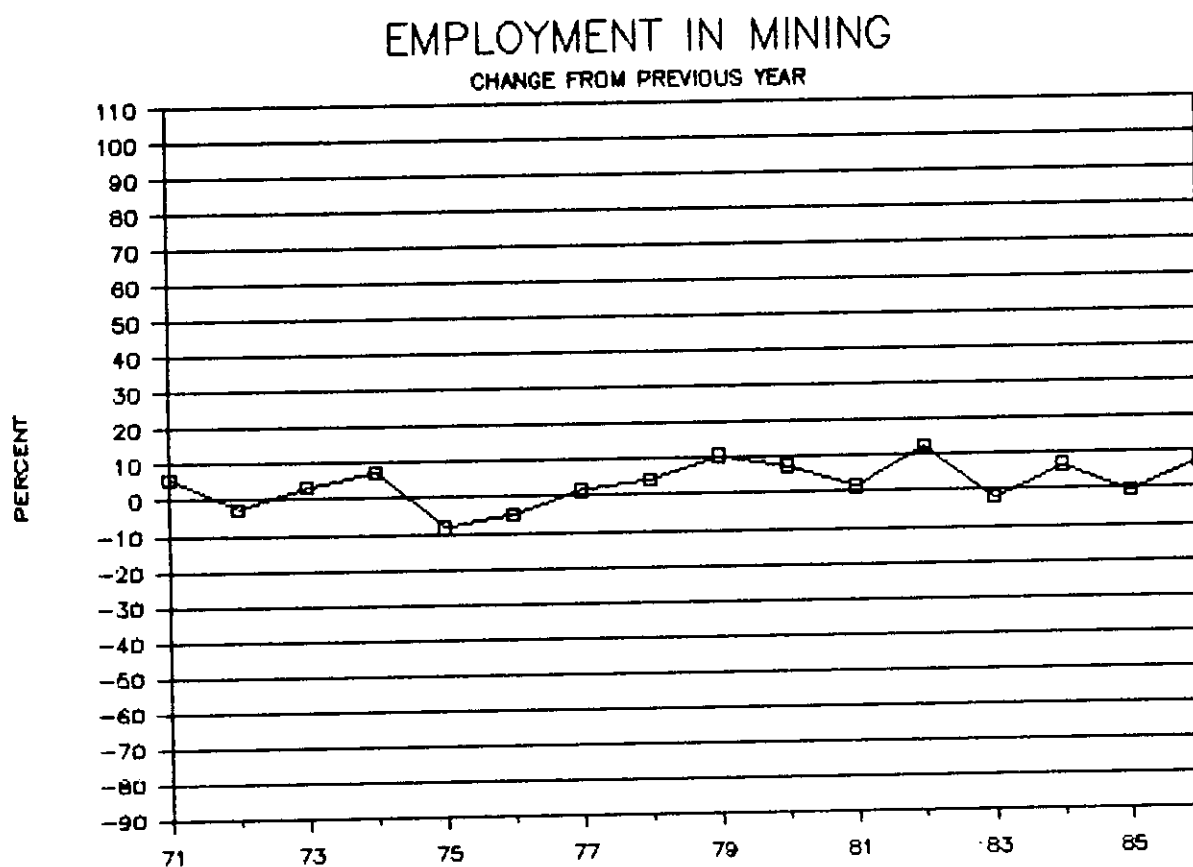
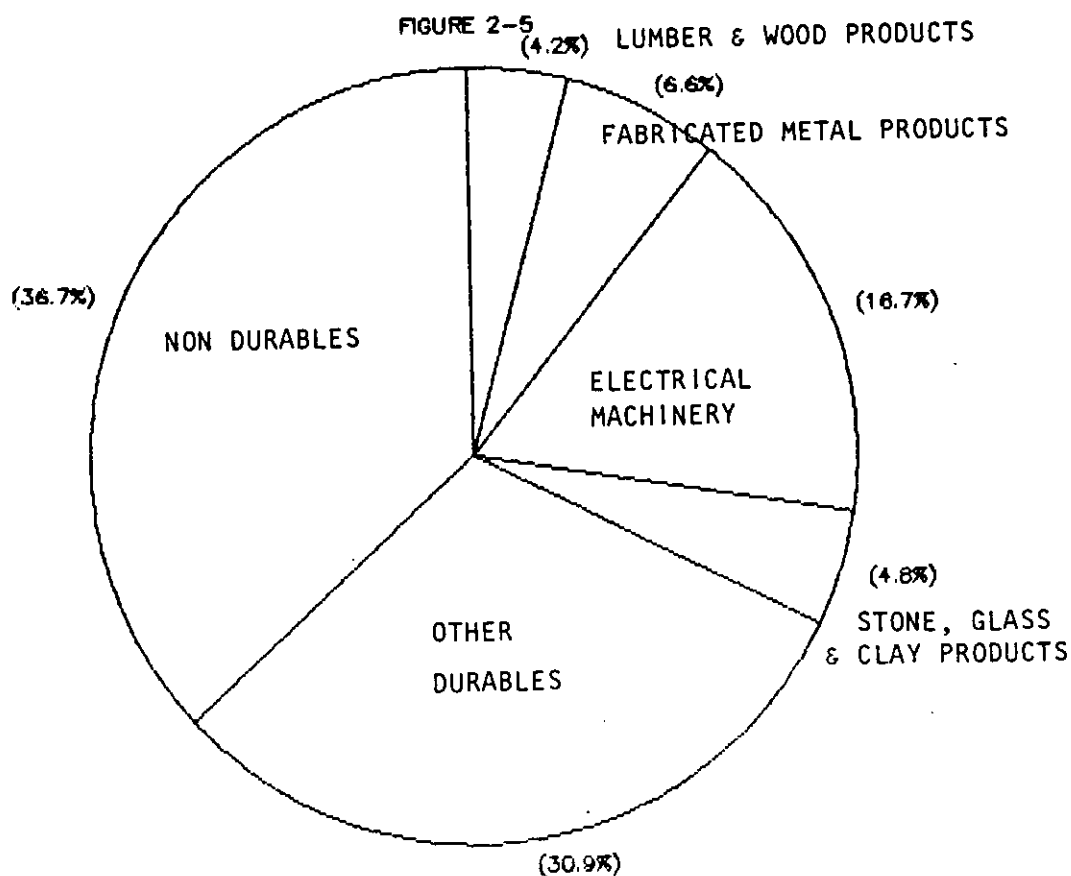


FIGURE 2-4

Manufacturing is commonly divided into durable goods and non-durable goods manufacturing. Many of the durable goods are construction related. Table 2-4 shows a breakout of construction related employment from the complete manufacturing industry list for March 1985. This results in a conservative estimate that 12.4% of employment in manufacturing is construction related. Figure 2-5 is based on data from the State Data Base (Table 2-5) and separates manufacturing into several main construction related areas based on wage and salary disbursements.¹²

MFG. WAGE/SALARY DISBURSEMENTS - 1984



A comparison of the yearly percent change in employment for contract construction and manufacturing in Figure 2-6 shows employment to be more stable in manufacturing than in construction.

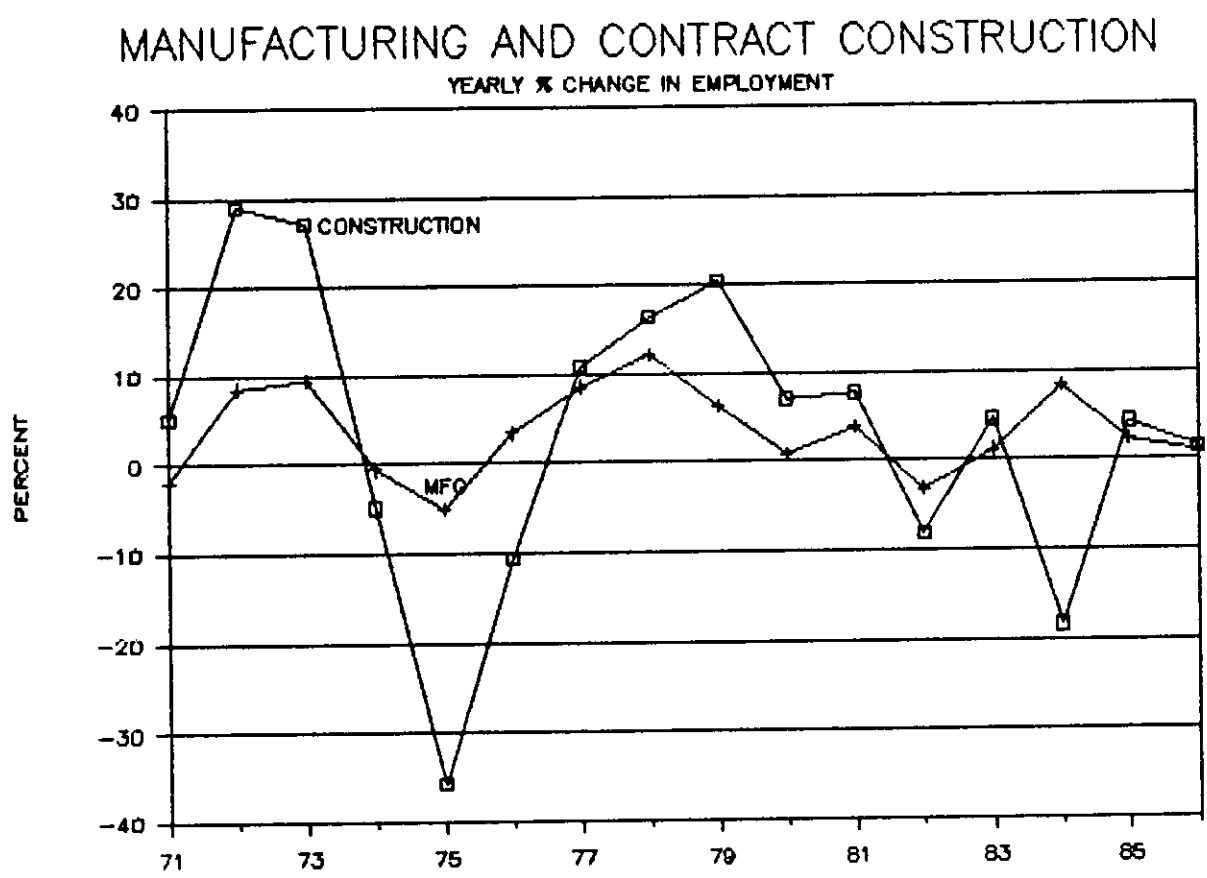
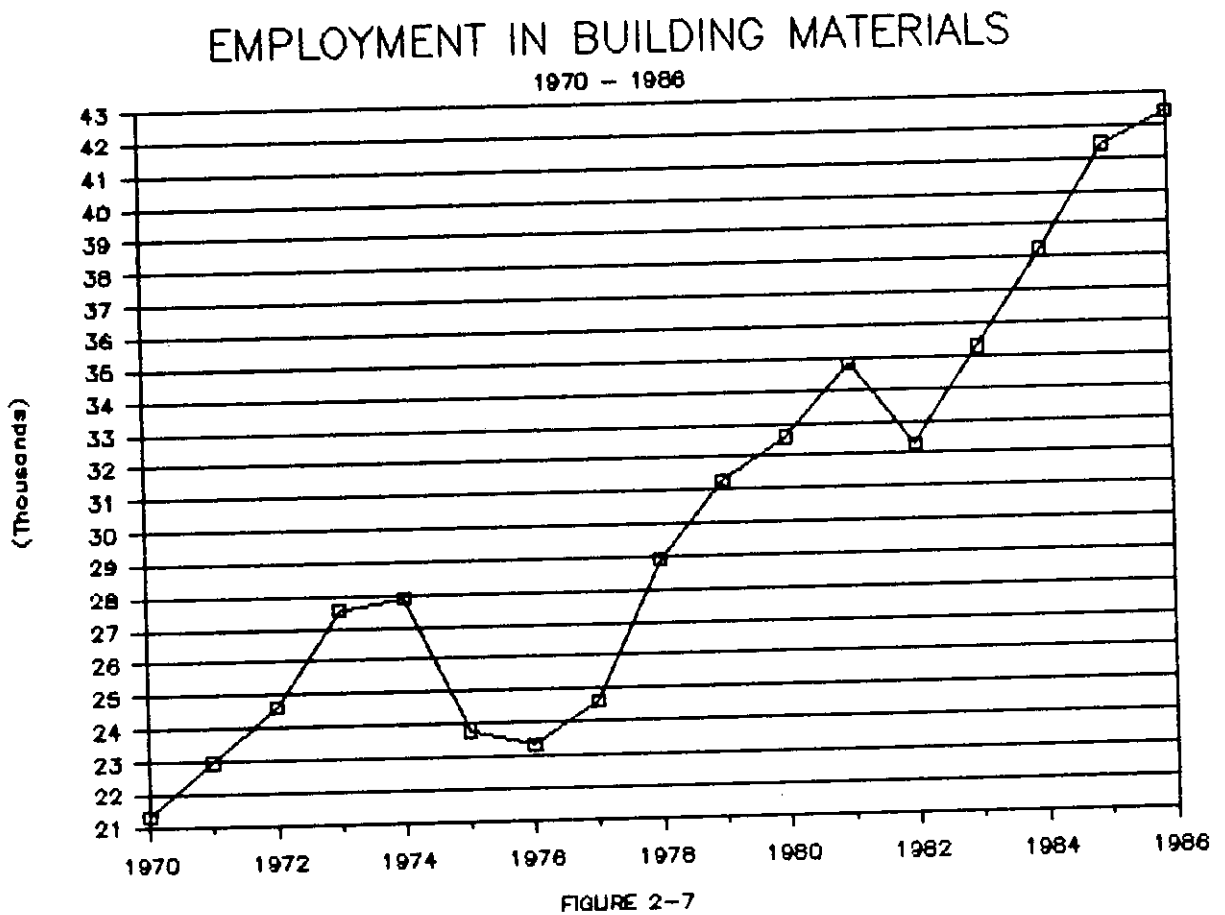


FIGURE 2-6

WHOLESALE & RETAIL TRADE

Table 2-6 gives a breakout of construction related wholesale

and retail trade. Items 506, 507, and 508 were estimated at the percentages given to the right. The resulting 5.0% of wholesale and retail trade employment that is construction related may be conservative. Figure 2-7 graphs the building materials employment figures from Table 2-1. Note again the 1974-76 and 1981-82 recessions.



Comparing Figure 2-8 with the construction line in Figure 2-1 will show employment in building materials more stable than employment in construction.

EMPLOYMENT IN BUILDING MATERIALS

CHANGE FROM PREVIOUS YEAR

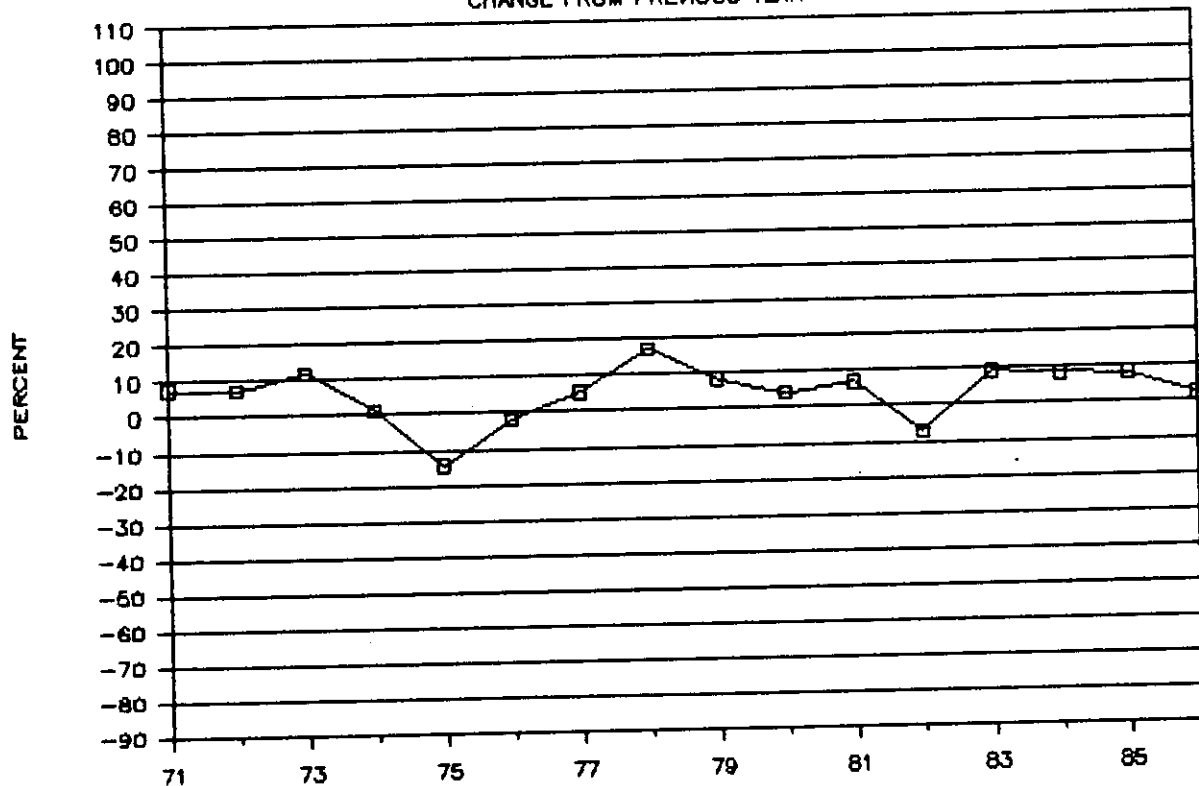


FIGURE 2-B

FINANCE, INSURANCE & REAL ESTATE

This report does not make a detailed breakout of construction related areas of this industry division. The following, however, should be considered. Nearly all new residential construction is financed by mortgages. Nearly all new commercial construction is financed by mortgages. Construction firms take advantage of commercial borrowing as much as other commercial ventures.

Nearly all new construction is insured during construction

with builders risk insurance and upon completion with hazard insurance. All construction firms with more than three employees are required by law to have worker compensation coverage. State licensing law requires employer's liability insurance coverage. Construction firms, like any other businesses, carry their share of automotive liability, key man life insurance, theft, and other insurances.

Much new residential construction is sold by real estate firms. After construction, many commercial buildings are leased, managed, and resold through real estate firms. Most single family residential construction is resold through real estate firms. The national average for turnover in home ownership is approximately 20% per year.¹⁸ This means that on average a home will be sold every five years. If the average economic life of a home is taken as 35 years, then, on average, it will be sold as a used home six times (most likely by a real estate firm).

Real estate investors typically evaluate residential income property as approximately 20% land and 80% improvements.¹⁹ The 80% is nearly all construction. This generally holds true for all improved real estate. The majority of the value is in the improvements, the construction.

SERVICES

The construction related area of this section is the business services area. In addition to the general business services which construction firms use as well as other

businesses, the construction industry makes particular use of the services of engineers, architects, & surveyors. Table 2-7 shows a county breakdown of this business service sector. Note that Brevard county shows a disproportionate share. The high concentration of engineers working for N.A.S.A. and for related high technology firms like Harris Corporation may account for this variation.

AGRICULTURE, FORESTRY, & FISHERIES

Agriculture consists of crop and livestock production and related agricultural services. Although some construction materials are made from by-products of the agriculture industry, such as fiberboard from sugar cane, that would be considered as part of the manufacturing subsector, "Food and kindred products", and not part of agriculture. Fisheries also have little direct relationship with the construction industry.

Florida ranks 3rd in acreage of tree farms following Georgia and Alabama, and slightly leading 4th place Oregon. As of January, 1985, Florida had 6,765,679 acres of tree farms, 7.8% of the U.S. total. 21

Forest products are mainly pulpwood and saw/veneer logs of both hardwoods and softwoods. The majority of saw/veneer logs are used to make structural timbers, dimension lumber, boards, plywood, paneling, and other wood products directly linked with the construction industry. Pulpwood products include construction related items such as particleboard, masonite, and

pressboard products.

Hardwood production is concentrated in Dixie, Taylor and Levy counties. These three counties account for 34.4% of hardwood production for the State, with a total of 13,192,000 cubic feet produced in 1984.²²

Softwood production leaders are Taylor (28,545,000 cf), Columbia (21,339,000 cf), Baker (17,757,000 cf), and Marion (15,509,000 cf) counties. Total softwood production for 1984 was 416,234,000 cubic feet.²³

According to Unemployment Compensation figures for March 1985, there were 1,829 people employed in the forestry industry in Florida.

GOVERNMENT

Government, as an industry division, consists of the following subsectors:

- 91 Executive, legislative, & general government,
 except finance
- 92 Justice, public order, and safety
- 93 Public finance, taxation, and monetary policy
- 94 Administration of human resources programs
- 95 Administration of environmental quality and
 housing programs
- 96 Administration of economic programs
- 97 National security and international affairs

Certainly, construction is affected by taxation, monetary policy, and environmental programs; but it is zoning and codes enforcement, building inspection and permitting departments, planning and review committees, and housing programs that are more directly construction related.

III. CONSTRUCTION'S CONTRIBUTION TO TAX REVENUES

The State and local taxes that most affect construction, mining, and prefabricated wood products including mobile homes are: 24

1. Corporate income tax - 5.5% income
2. Documentary stamp taxes - \$.15/\$100 on promissory notes, mortgages, trust deeds, security agreements
3. Mobile home licenses - \$20 to \$80/yr in 8 length classifications
4. Occupational licenses - local governing authority
5. Severance tax on solid minerals - 5% of value at the point of severance
6. Unemployment compensation tax - up to 5.4% of first \$7,000 wages per employee
7. Sales and use tax - 5%

The sales and use tax is by far the largest single contributor to total State taxes. For fiscal 1983-84 sales and use tax receipts were \$4,356,680,000 which was 52.0% of total

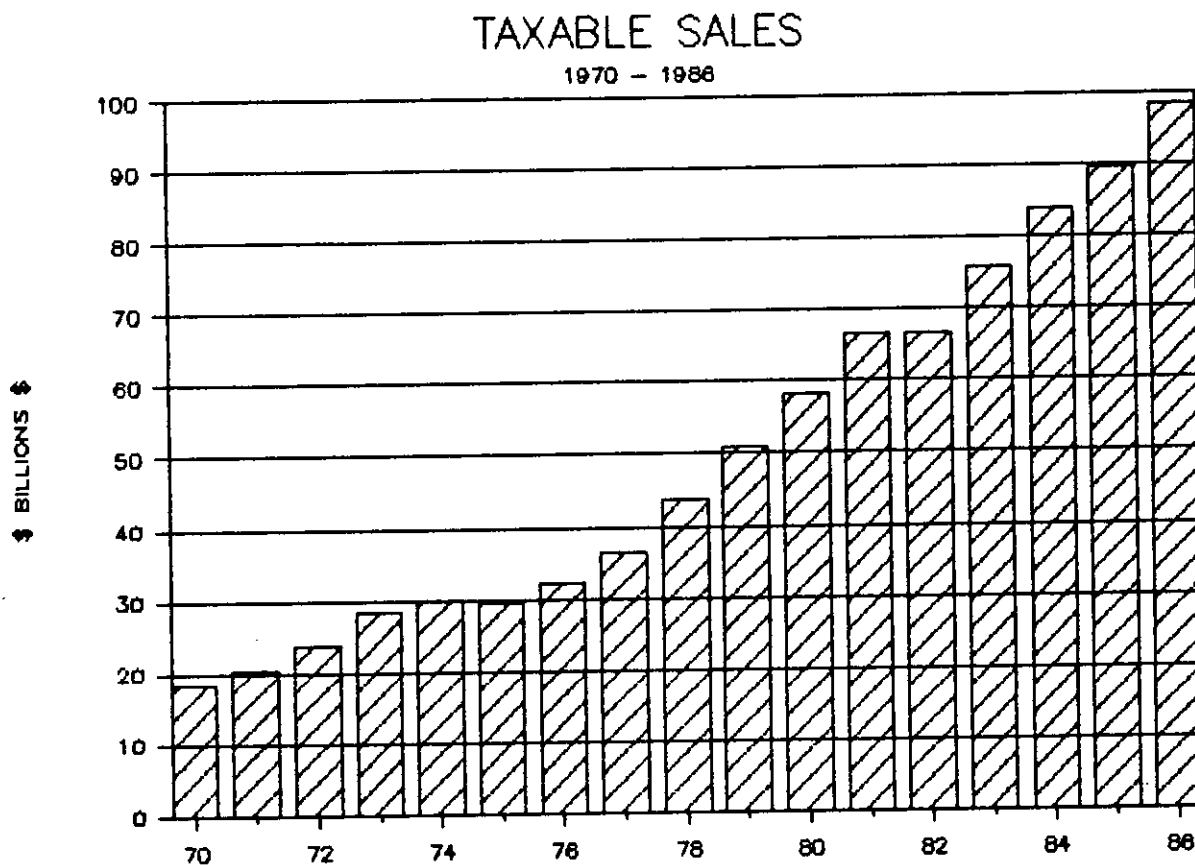
State tax receipts.²⁵

FIGURE 2-9

Table 2-8 contains calendar year totals for taxable sales; State sales tax revenue; and sales tax revenue from lumber, builders, and contractors. The trend in taxable sales is shown in Figure 2-9. Note the recession years of 1974-76 and 1981-82. Figure 2-10 shows the trend in State sales and use tax revenue. The 1974-76 pattern reflects the pattern in taxable sales, but the 1981-82 pattern does not. The State sales tax was increased to 5% from 4% effective May 1, 1982. Therefore, for eight months

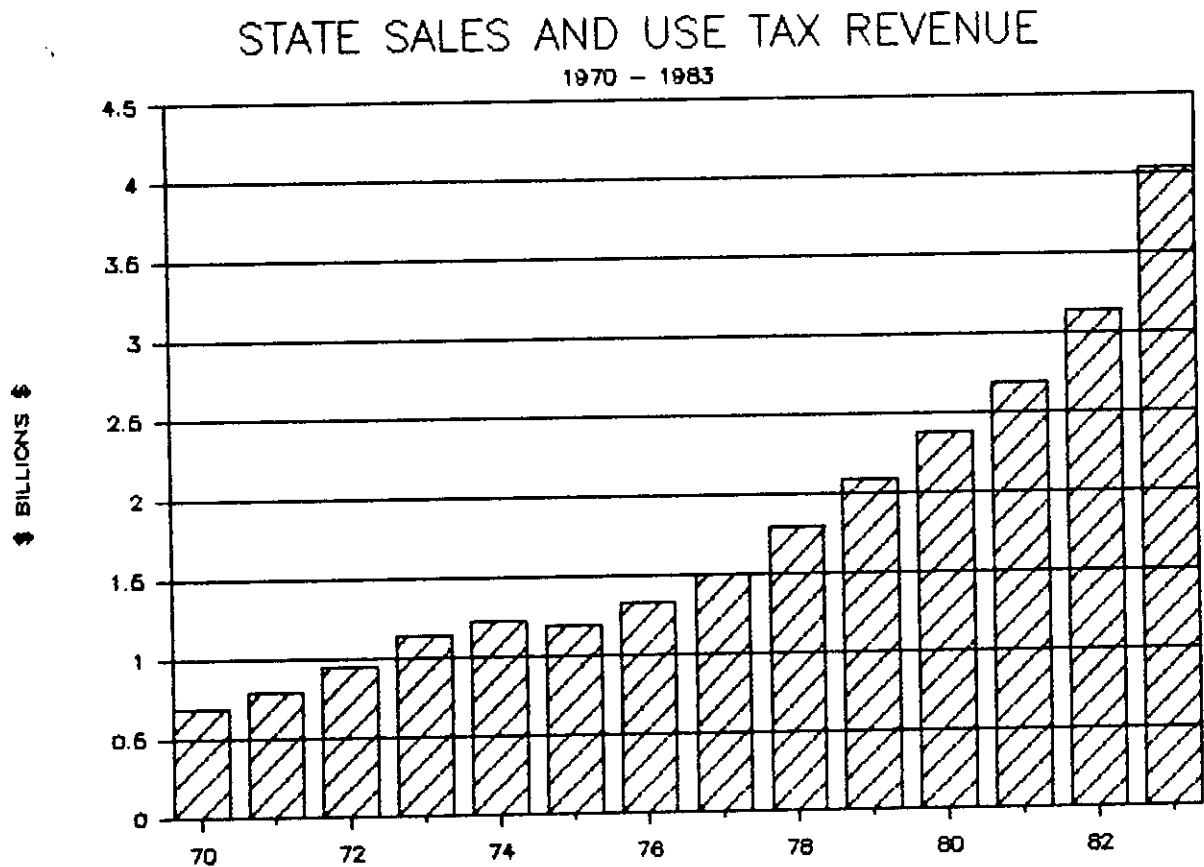


FIGURE 2-10

of 1982 the State was collecting sales taxes at a rate 25% higher than before. Figure 2-11 is a graph of the yearly percent change in sales and use tax revenue.

During periods of tight credit and resulting higher interest rates, State and local governments have had difficulty securing financing. They share this characteristic with private sector construction borrowers. Most construction requires long-term capital borrowing just like that required by governments. As we have seen in Figures 2-1 and 2-2 the construction industry is

highly volatile. In the next chapter we will see which

SALES TAX REVENUE FROM LUMBER BUILDERS, CONTRACTORS 1970 - 1983

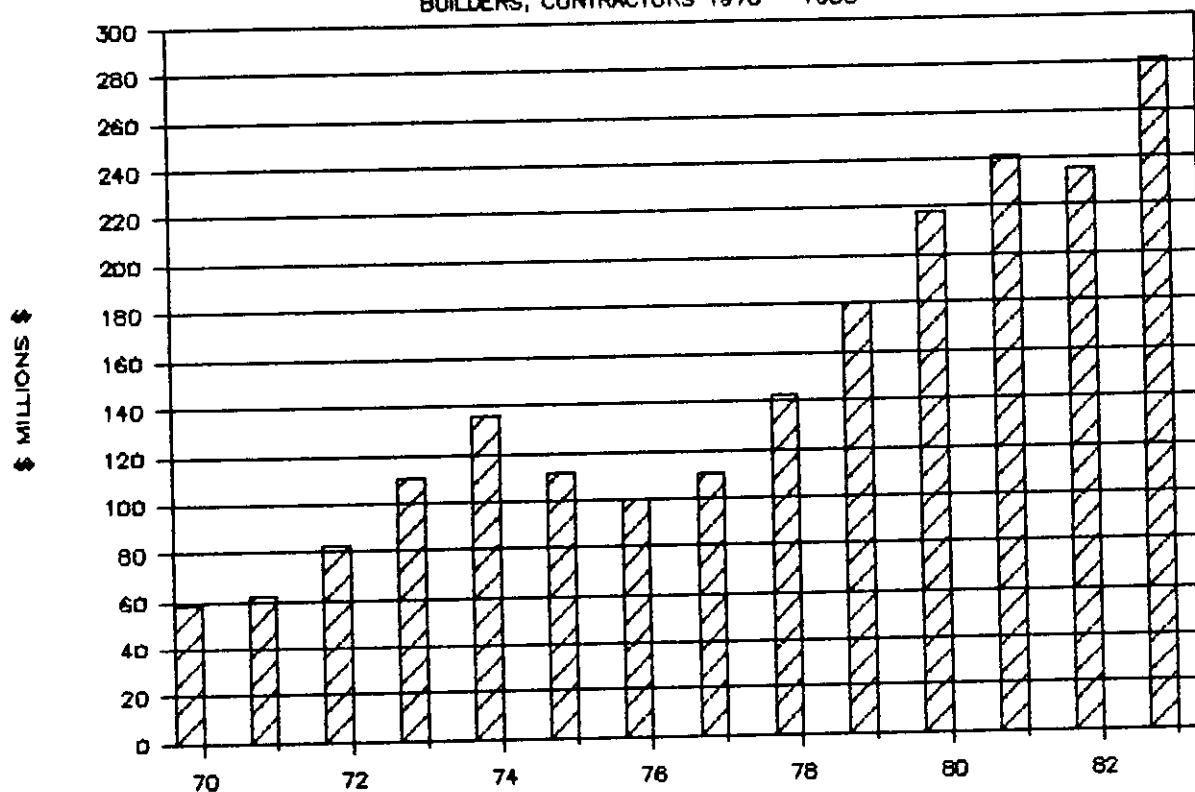


FIGURE 2-11

subsectors of the construction are the most volatile. Because of this sensitivity to the credit cycle, any reliance on the construction industry in times of recession and high interest rates for State revenues may result in a greater need for long term State borrowing just when rates are at their highest.

Sales tax revenue from lumber, builders, and contractors is listed in Table 2-8 and shown in Figure 2-11. While total sales

and use tax increased slightly from 1974 to 1976, the revenue from lumber, builders, and contractors decreased from \$136 million in 1974 to \$100 million in 1976. There was also a slight decrease from this construction sector from 1981 to 1982. In 1974 sales tax revenues from lumber, builders, and contractors was 11.1% of State sales and use tax revenues. By 1983 this had dropped to 7.0%.

CONSTRUCTION RELATED INDUSTRIES

1970 - 1986

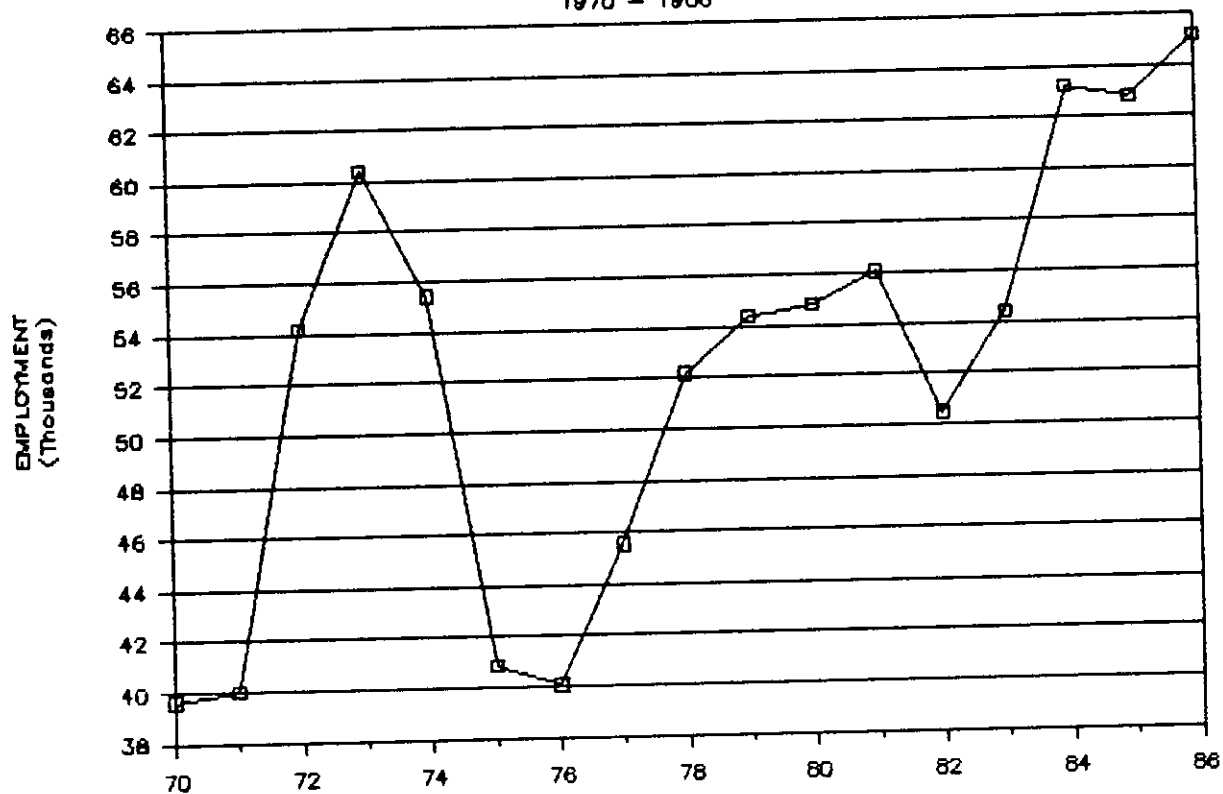


FIGURE 2-12

IV. CONSTRUCTION RELATED INDUSTRY EMPLOYMENT

In the previous sections of this chapter the relationship of the construction industry to other industry divisions of the Florida economy have been pointed out. Several industry divisions have been analyzed for construction related areas. The Florida Department of Labor and Employment Security has aggregated employment in construction related industries and the results are shown in Table 2-1 and Figure 2-12.

The drop in employment from 1973-76 is dramatic. Note also the drop in employment from 1981 to 1982. The year to year percent change in employment in construction related industries is shown in Figure 2-13. Comparison of this figure with the construction line in Figure 2-2 will show that construction itself is still more volatile.

CONSTRUCTION RELATED EMPLOYMENT

CHANGE FROM PREVIOUS YEAR

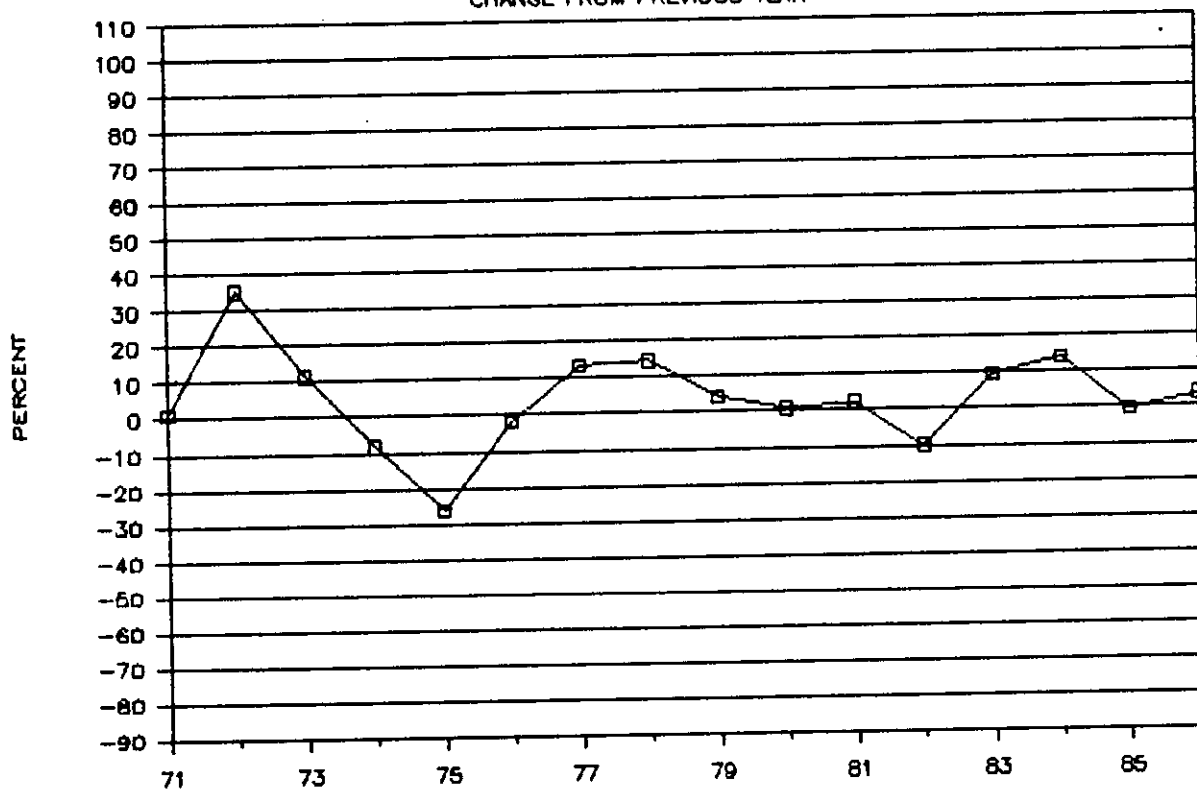


FIGURE 2-13

TABLE 2-1

CONSTRUCTION AND RELATED EMPLOYMENT
FOUR QUARTER AVERAGE; WITH YEAR TO
YEAR % CHANGE ³

YEAR	CONSTRUCTION		MINING		BUILDING MATERIALS		CONSTRUCTION RELATED INDUSTRIES	
	(000)S	% CHG	(000)S	% CHG	(000)S	% CHG	(000)S	% CHG
1970	163.73		8.64		21.34		39.63	
1971	172.05	5.08	9.16	5.96	22.98	7.68	39.99	0.91
1972	221.99	29.03	8.93	-2.54	24.62	7.14	54.20	35.52
1973	282.10	27.07	9.23	3.36	27.55	11.87	60.45	11.53
1974	268.05	-4.98	9.90	7.32	27.90	1.27	55.42	-8.31
1975	172.18	-35.76	9.07	-8.33	23.81	-14.64	40.84	-26.32
1976	153.95	-10.58	8.63	-4.94	23.35	-1.96	40.09	-1.81
1977	170.53	10.77	8.76	1.52	24.61	5.43	45.55	13.59
1978	198.34	16.31	9.15	4.43	28.90	17.38	52.19	14.58
1979	238.92	20.46	10.12	10.64	31.30	8.31	54.39	4.22
1980	255.73	7.03	10.89	7.66	32.58	4.07	54.81	0.77
1981	275.35	7.67	11.07	1.60	34.84	6.96	56.07	2.28
1982	252.95	-8.14	9.68	12.58	32.31	-7.26	50.47	-9.97
1983	264.66	4.63	9.47	-2.12	35.29	9.21	54.44	9.83
1984	313.40	-18.41	10.10	6.69	38.25	8.41	63.20	13.99
1985	326.68	4.24	10.06	-0.47	41.43	8.30	62.81	-0.61
1986	331.27	1.40	9.28	7.74	42.43	2.41	65.17	3.76

TABLE 2-2

CONSTRUCTION RELATED MINING; BASED
ON EMPLOYMENT COVERED BY UNEMPLOYMENT
COMPENSATION LAW, MARCH 1985 ⁸

SIC* CODE	INDUSTRY	CONST. RELATED	OTHER
10	METAL MINING & SERVICES		375
12,13	COAL, OIL & GAS EXTRACTION		1059
			10
141	DIMENSION STONE	65	
142	CRUSHED & BROKEN STONE INC. RIPRAP	2256	
144	SAND AND GRAVEL	860	
145	CLAY, CERAMIC & REFRACTORY MINERALS	304	
147,149	CHEMICAL, FERTILIZER & MISC MINERALS		5327
148	NONMETAL, NONFUEL SERVICES		39
	TOTALS	3485	6810
	TOTAL EMPLOYMENT IN MINING		10295

33.8 PERCENT OF EMPLOYMENT IN MINING IS
CONSTRUCTION RELATED.

*STANDARD INDUSTRIAL CLASSIFICATION DEVELOPED BY U.S.
OFFICE OF MANAGEMENT AND BUDGET.

TABLE 2-3

VALUE OF CONSTRUCTION RELATED
MINERAL PRODUCTION, 1983 & 1984
IN THOUSANDS OF DOLLARS ⁹

MINERAL	1983		1984	
	CON REL	OTHER	CON REL	OTHER
MASONRY CEMENT	19557		24624	
PORTLAND CEMENT	164048		172548	
CLAYS	31566		34048	
GEMSTONES		6		6
LIME (75% CON REL)	10410	3471	7035	2344
PEAT		1999		5454
SAND AND GRAVEL	31500	3447	48494	9815
CRUSHED STONE	235700		290000	
COMB. VAL. OF KAOLIN, MAG- NESIUM, PHOSPHATE, RARE- EARTH, INDUSTRIAL SAND & GRAVEL, STAUROLITE, TI- TANIUM, ZIRCON CONCENT.		774122		915996
TOTALS	492781	779568	552125	933615
38.7 PERCENT OF 1983 NONFUEL MINERAL VALUE IS CONSTRUCTION RELATED			37.1 PERCENT FOR THE YEAR 1984	

TABLE 2-4

CONSTRUCTION RELATED MANUFACTURING
 BASED ON EMPLOYMENT COVERED BY
 UNEMPLOYMENT COMPENSATION LAW,
 MARCH, 1985 11

SIC CODE	INDUSTRY	EMPLOYEES	
		CON.REL	MFG. ONLY
			49402
20	FOOD AND KINDRED PRODUCTS		1993
21	TOBACCO MANUFACTURERS		2368
22	TEXTILE MILL PRODUCTS		32927
23	APPAREL AND OTHER FINISHED PRODUCTS MADE FROM FABRICS & SIM. MAT.		9591
24X	OTHER WOOD PRODUCTS EXCEPT FURNITURE	11617	
243	MILLWORK, VENEER, PLYWD, & STRUCTURAL WOOD MEMBERS		5228
245	WOOD BUILDINGS AND MOBILE HOMES		13105
25	FURNITURE AND FIXTURES		15020
26	PAPER AND ALLIED PRODUCTS		57368
27	PRINTING, PUBLISHING, & ALLIED IND.		26662
28	CHEMICALS AND ALLIED PRODUCTS		255
29X	PETROLEUM REFINING & OTHER PRODUCTS		
295	PAVING AND ROOFING MATERIALS	1636	18149
30	RUBBER AND MISC. PLASTIC PRODUCTS		2824
31	LEATHER AND LEATHER PRODUCTS		5108
32X	OTHER GLASS AND CLAY PRODUCTS		
325	STRUCTURAL CLAY PRODUCTS	1019	
327	CONCRETE, GYPSUM, & PLASTER PRODUCTS	17083	
328	CUT STONE AND STONE PRODUCTS	183	
33	PRIMARY METAL INDUSTRIES		5303
34X	OTHER FABRICATED METAL PRODUCTS EXCEPT MACHINERY & TRANS. EQUIP.		13601
343	HEATING EQUIP. (NON ELEC) & PLUMBING. FIXTURES	475	
344	FAB. STRUCTURAL METAL PRODUCTS	21440	
35X	OTHER MACHINERY, EXCEPT ELECTRICAL		42354
353	CONST., MINING, MATERIALS HANDLING	2789	
36X	OTHER ELECTRICAL & ELECTRONIC MACHINERY, EQUIP. & SUPPLIES		75718
364	ELECTRIC LIGHTING AND WIRING EQUIP.	2322	
37	TRANSPORTATION EQUIPMENT		56515
38	MEASURING ANALYZING & CONTROLLING INSTRUMENTS, PHOTO, MED., OPTICAL, WATCHES AND CLOCKS		14426
39	MISC. MANUFACTURING INDUSTRIES		8716
	TOTALS	63852	451305
	TOTAL EMPLOYMENT		515257
	CONSTRUCTION MATERIALS & EQUIPMENT = 12.39 PERCENT OF EMPLOYEES		

TABLE 2-5 MANUFACTURING WAGE/SALARY
DISBURSEMENTS 1984
IN \$THOUSANDS

CLASSIFICATION	\$\$	PERCENT
LUMBER & WOOD PROD (X FURN)	410632	4.22
FAB. METAL PRODUCTS	642715	6.61
ELEC. MACHINERY	1627907	16.75
STONE, GLASS, CLAY PRODUCTS	468030	4.82
OTHER DURABLES	3007921	30.95
NON-DURABLE GOODS	3562338	36.65

TABLE 2-6

CONSTRUCTION RELATED WHOLESALE &
RETAIL TRADE; EMPLOYMENT COVERED
BY UNEMPLOYMENT COMPENSATION LAW,
MARCH 1985 ¹⁵

SIC CODE	INDUSTRY	CONST. RELATED	WHSL/RTL TRADE ONLY
	<u>WHOLESALE TRADE</u>		
50X	DURABLE GOODS OTHER THAN BELOW		121653
503	LUMBER AND OTHER CONSTRUCTION MTLs.	12405	
506	ELECTRICAL GOODS (10% OF)	2280	
507	HARDWARE, PLBG & HTG. EQ. (25%OF)	3174	
508	MACHINERY, EQ., & SUPPLIES (10%OF)	5715	
51	NONDURABLE GOODS		100017
	<u>RETAIL TRADE</u>		
521	LUMBER AND OTHER CONSTRUCTION MTLs.	24060	
523	PAINT, GLASS, & WALLPAPER STORES	3809	
525	HARDWARE STORES	6164	
526	RETAIL NURSERIES & GARDEN STORES		4082
527	MOBILE HOME DEALERS	2583	
53	GENERAL MERCHANDISE STORES		120827
54	FOOD STORES		156133
55	AUTOMOTIVE DEALERS AND GAS STATIONS		102662
56	APPAREL & ACCESSORIES STORES		51787
57	FURNITURE, HOME FURNISHINGS, & EQ.		47105
58	EATING AND DRINKING PLACES		329411
59	MISCELLANEOUS RETAIL		105265
	TOTALS	60190	1138942
	TOTAL EMPLOYMENT IN WHOLESALE/RETAIL		1199132

5.0 % OF TOTAL EMPLOYMENT IS
CONSTRUCTION RELATED

TABLE 2-7 COUNTY CONSTRUCTION RELATED EMPLOYMENT FOR
SELECTED INDUSTRY DIVISIONS; BASED ON
EMPLOYMENT COVERED BY UNEMPLOYMENT COMPENSATION
LAW, MARCH 1985 20

COUNTY	CONST. RELATED MANUF.	PCT OF TOTAL	CONST. RELATED WHSL/RTL TRADE	PCT OF TOTAL	ENGINEER ARCHITECT SURVEYOR SERVICES	PCT OF TOTAL
ALACHUA	575	0.90	114	0.93	986	2.62
BAKER	21	0.03	2	0.01	10	0.03
BAY	460	0.72	77	0.62	242	0.64
BRADFORD	71	0.11	3	0.02	10	0.03
BREVARD	3354	5.25	165	1.34	6558	17.46
BROWARD	5528	8.66	1048	8.55	2690	7.16
CALHOUN	47	0.07	4	0.04	10	0.03
CHARLOTTE	52	0.08	12	0.09	94	0.25
CITRUS	84	0.13	12	0.10	142	0.38
CLAY	165	0.26	60	0.49	113	0.30
COLLIER	207	0.32	51	0.41	322	0.86
COLUMBIA	307	0.48	25	0.21	65	0.17
DADE	11813	18.50	2997	24.43	4003	10.66
DESOTO	62	0.10	10	0.08	10	0.03
DIXIE	65	0.10	0	0.00	10	0.03
DUVAL	3849	6.03	1134	9.25	2793	7.43
ESCAMBIA	1291	2.02	207	1.68	524	1.39
FLAGLER	57	0.09	4	0.03	10	0.03
FRANKLIN	13	0.02	8	0.07	0	0.00
GADSDEN	182	0.28	22	0.18	57	0.15
GILCHRIST	7	0.01	3	0.02	10	0.03
GLADES	3	0.00	1	0.00	10	0.03
GULF	149	0.23	1	0.01	10	0.03
HAMILTON	309	0.48	1	0.01	0	0.00
HARDEE	35	0.05	10	0.08	10	0.03
HENDRY	103	0.16	5	0.04	68	0.18
HERNANDO	126	0.20	20	0.16	126	0.34
HIGHLANDS	111	0.17	21	0.17	23	0.06
HILLSB.	5172	8.10	1493	12.17	3135	8.34
HOLMES	81	0.13	4	0.03	60	0.16
INDIAN RIV	243	0.38	26	0.22	207	0.55
JACKSON	253	0.40	40	0.33	10	0.03
JEFFERSON	46	0.07	7	0.06	0	0.00
LAFAYETTE	9	0.01	1	0.01	10	0.03
LAKE	453	0.71	62	0.50	125	0.33
LEE	578	0.91	182	1.48	660	1.76
LEON	300	0.47	142	1.16	570	1.52
LEVY	45	0.07	8	0.07	60	0.16
LIBERTY	26	0.04	0	0.00	0	0.00

TABLE 2-7 CONTINUED

COUNTY	CONST. RELATED MANUF. TOTAL	PCT OF TOTAL	CONST. RELATED WHSL/RTL TRADE	PCT OF TOTAL	ENGINEER ARCHITECT OF SURVEYOR SERVICES	PCT OF TOTAL
MADISON	174	0.27	6	0.05	10	0.03
MANATEE	1011	1.58	81	0.66	299	0.80
MARION	1073	1.68	160	1.30	235	0.63
MARTIN	395	0.62	23	0.19	196	0.52
MONROE	68	0.11	30	0.24	65	0.17
NASSAU	309	0.48	9	0.08	74	0.20
OKALOOSA	501	0.79	40	0.33	1181	3.14
OKEECHO.	30	0.05	12	0.09	36	0.10
ORANGE	4500	7.05	1054	8.59	3703	9.86
OSCEOLA	201	0.31	42	0.34	70	0.19
PALM BCH.	4528	7.09	525	4.28	2283	6.08
PASCO	509	0.80	58	0.47	174	0.46
PINELLAS	5565	8.72	591	4.82	2441	6.50
POLK	2855	4.47	334	2.73	759	2.02
PUTNAM	443	0.69	11	0.09	53	0.14
ST. JOHNS	274	0.43	36	0.29	64	0.17
ST. LUCIE	303	0.47	60	0.49	152	0.40
SANTA ROSA	225	0.35	16	0.13	75	0.20
SARASOTA	935	1.46	160	1.31	654	1.74
SEMINOLE	1251	1.96	190	1.55	425	1.13
SUMTER	81	0.13	8	0.06	15	0.04
SUWANNEE	161	0.25	9	0.08	8	0.02
TAYLOR	292	0.46	9	0.08	10	0.03
UNION	72	0.11	3	0.02	0	0.00
VOLUSIA	1466	2.30	137	1.11	501	1.33
WAKULLA	77	0.12	3	0.02	10	0.03
WALTON	128	0.20	5	0.04	10	0.03
WASHINGTON	64	0.10	2	0.02	10	0.03
STATEWIDE	98	0.15	671	5.47	312	0.83
TOTAL	63840	100	12265	100	37568	100

NOTE: SOME COUNTY FIGURES WERE ESTIMATED FROM
DATA FOUND IN THE FLORIDA STATISTICAL ABSTRACT

TABLE 2-8 CONSTRUCTION SHARE OF THE SALES TAX
 CALENDAR YEAR TOTAL; WITH YEAR TO
 YEAR PERCENT CHANGE ²⁶

YEAR	INDUSTRY TAXABLE SALES		STATE SALES/USE TAX REVENUE		SALES TAX FROM LUMBER, BLDRS. & CONTRACTORS		PCT. SHARE OF LUM. BLDG. & CONTRACTORS	
	(\$MIL)	%CHG	(\$MIL)	%CHG	(\$MIL)	%CHG	(PCT)	%CHG
1970	18332		682		59		8.64	
1971	20359	11.06	785	15.08	62	5.09	7.89	-8.67
1972	23886	17.32	947	20.70	83	34.41	8.78	11.36
1973	28467	19.18	1137	20.04	110	32.33	9.68	10.24
1974	29751	4.51	1216	6.97	136	23.07	11.14	15.05
1975	29403	-1.17	1197	-1.57	111	-17.93	9.29	-16.62
1976	32244	9.66	1323	10.54	100	-10.34	7.53	-18.89
1977	36233	12.37	1500	13.37	110	9.83	7.30	-3.12
1978	43634	20.43	1794	19.57	142	29.95	7.93	8.69
1979	50776	16.37	2091	16.56	180	26.77	8.63	8.76
1980	58154	14.53	2385	14.10	219	21.56	9.19	6.54
1981	66716	14.72	2692	12.85	241	9.90	8.95	-2.62
1982	66627	-0.13	3135	16.46	236	-2.12	7.52	-15.95
1983	75754	13.70	4035	28.72	282	19.71	7.00	-7.00

Notes to Chapter 2

1. Bureau of Business and Economic Research, The BEBR Computerized Data Base (Gainesville: Northeast Regional Data Center, University of Florida, 1986), File ECFNS.
2. BEBR, Computerized Data Base, Files TENAGENS and ECFNS.
3. Ibid.
4. The Florida Chamber, Economic Profile of Florida Counties (Tallahassee: Florida Chamber of Commerce, 1986), 2.
5. Ibid.
6. Anne H. Shoemyen, ed., 1986 Florida Statistical Abstract (Gainesville: University Presses of Florida, 1986), 281.
7. BEBR, Computerized Data Base, File EMIFNS.
8. Shoemyen, Florida Statistical Abstract, 280.
9. Ibid, 310.
10. BEBR, Computerized Data Base , File EMIFNS.
11. Shoemyen, Florida Statistical Abstract , 319.
12. Florida Division of Economic Development, State Data Base Computer Files, (Tallahassee: Florida State University, 1986), Data Type 4701.
13. Ibid.
14. BEBR, Computerized Data Base , Files CEF and MEF.
15. Shoemyen, Florida Statistical Abstract , 415-416.
16. BEBR, Computerized Data Base , Files TENAGENS and ECFNS.
17. Ibid, File BLDMAT.
18. Author's personal data.
19. Ibid.
20. Shoemyen, Florida Statistical Abstract , 349,437-438,474. Note: Where actual figures were not available, estimates were made by the present authors.
21. Shoemyen, Florida Statistical Abstract , 278.

22. Ibid., 275-276.
23. Ibid.
24. Florida Department of Revenue, Guidebook to Florida Taxes and Licensing Requirements, (Tallahassee: Florida Department of Revenue, 1985), 13, 17, 18, 31-36, 39, 40.
25. Shoemyen, Florida Statistical Abstract, 561.
26. BEBR, Computerized Data Base, Files TSALESNS, TX-SNSA, TXS6.
27. Ibid, File TSALESNS.
28. Ibid, File TX-SNSA.
29. Ibid, File TXS6.
30. Ibid, File CONREL.

CHAPTER 3.

CONSTRUCTION SUBSECTORS, MINING, AND MOBILE HOMES

I. GENERAL CLASSIFICATIONS, DEFINITIONS, AND U.S. DATA

CATEGORIES & GROUPING

The format for "New Construction Put in Place", a census grouping, is broken down as follows: ¹

1. Private construction

A. Residential bldgs.(including farmhouses)

1) New housing

a. 1 unit housing

b. 2+ unit housing

2) Additions & alterations

3) Non-housekeeping (hotels/motels)

B. Non-residential buildings

1) Industrial

2) Office buildings

3) Other commercial

4) Religious

5) Educational

6) Hospital & institutional

7) Misc. non-residential buildings

a. Amusement buildings

b. Residential garages

c. Other structures & bldgs.

C. Farm non-residential

D. Public utilities

1) Telephone & telegraph

2) Other public utilities

a. Gas

b. Electric light & power

c. Railroads

d. Petroleum pipelines

E. All other private

2. Public

A. Buildings

1) Housing & redevelopment

2) Industrial

3) Educational

4) Hospital

5) Other public buildings

B. Highways & streets

C. Military facilities

D. Conservation & development

E. Other public construction

1) Sewer systems

2) Water supply facilities

3) Misc. public construction

"Contract Construction" , as defined by the Department of Labor, is categorized by type of contractor as follows:²

1. General building contractors

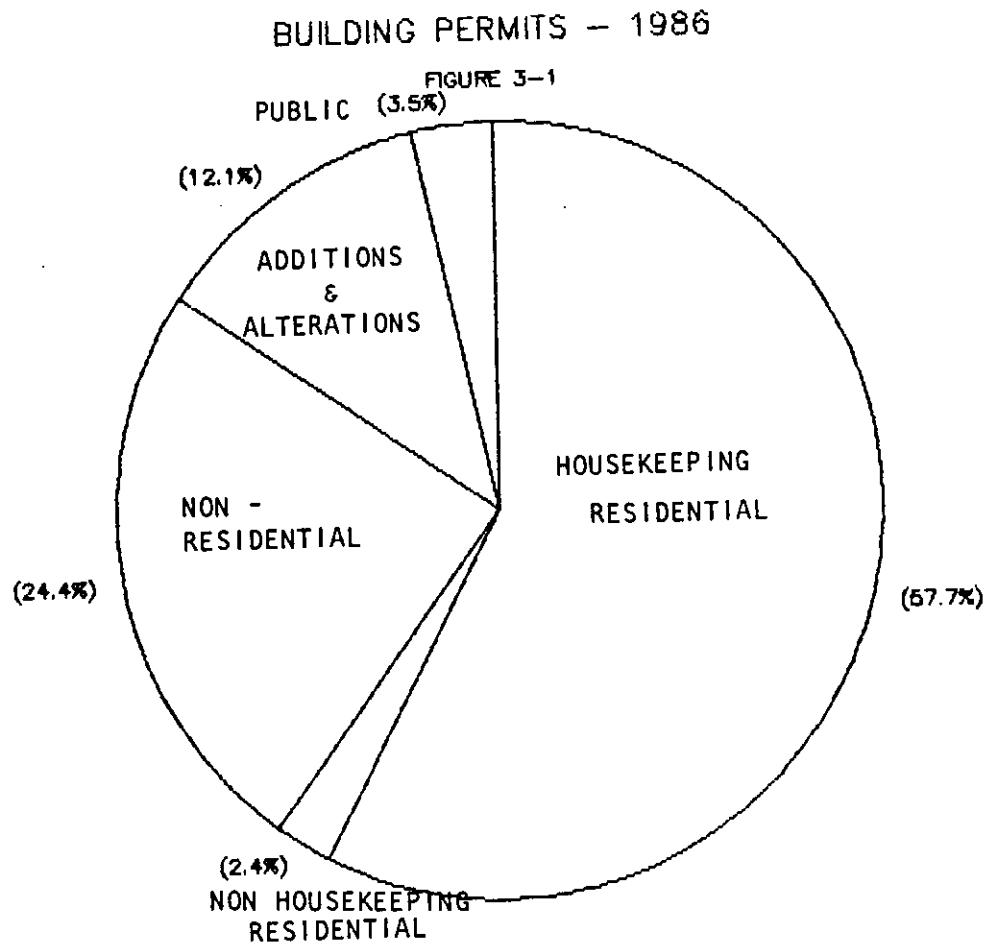
- A. Residential building
- B. Operative Builders
- C. Non-residential building
- 2. Heavy construction contractors
 - A. Highway & street
 - B. Heavy construction (except highway)
- 3. Special trade contractors
 - A. Plumbing, heating and air conditioning
 - B. Painting, paperhanging, & decorating
 - C. Electrical work
 - D. Masonry, stonework, & plastering
 - E. Carpeting & flooring
 - F. Roofing & sheetmetal
 - G. other

"Building Permit Activity", as collected and reported by the Bureau of Economic and Business Research at the University of Florida, categorizes that construction for which permits are required as listed below. Figure 3-1 and Table 3-1 shows the 1986 makeup of total value of building permits. ³

1. Private

- A. Housekeeping residential
- B. Non-housekeeping residential
- C. Non-residential
- D. Additions and alterations

2. Public



The "Value of Construction Contracts", including new and additions & major alterations, both public and private, as reported by F.W. Dodge Division, is broken down by project type below. Figure 3-2 and Table 3-2 show distribution and value of construction contracts for 1984 as reported by the Bureau of Economic Analysis. ⁴

1. Building construction

A. Residential

1) Housekeeping residential bldgs.

2) Non-housekeeping res. buildings

B. Non-residential buildings

1) Commercial building

2) Manufacturing buildings

3) Educational & science buildings

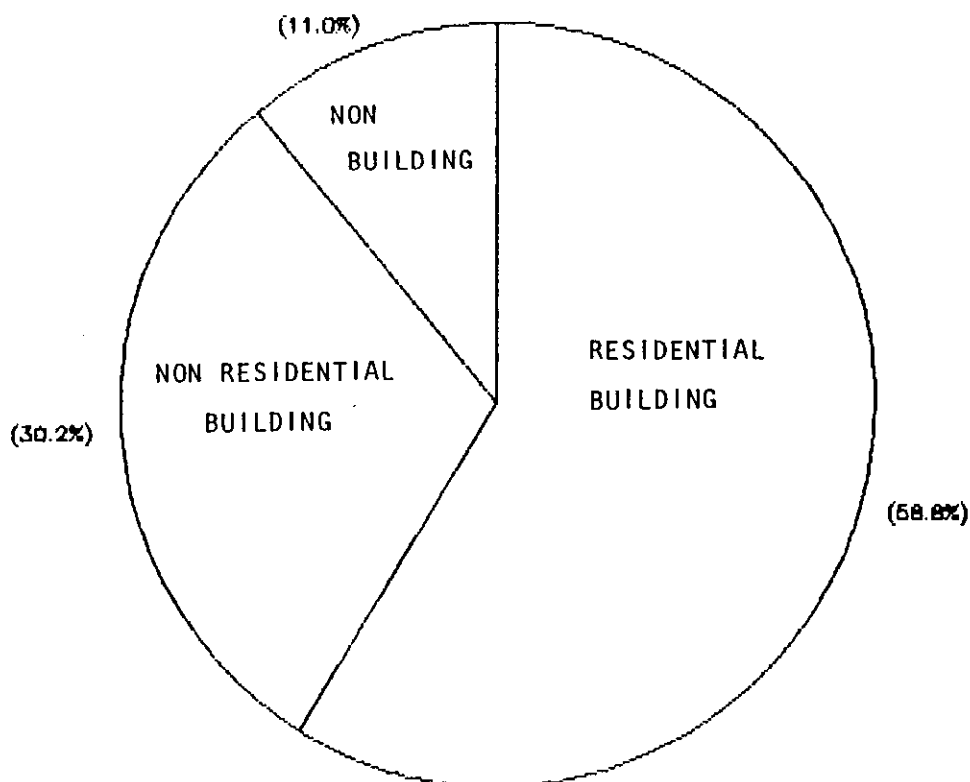
4) Hospital & health treatment bldgs

5) Public buildings

2. Non-building construction

CONSTRUCTION CONTRACTS - 1984

FIGURE 3-2



The most detailed categorization of the economy is

accomplished using the S.I.C. (Standard Industrial Classification) Codes. Tables 1-2, 2-2, 2-4, and 2-5 show these code categories. The listing at the end of the next paragraph shows the S.I.C. subsector codes that would most closely match the new construction subsectors in the RIMS II input-output analysis described in Chapter 5.

The Florida Contractor's Licensing Law, Chapter 489, F.S. requires licensing of most contractors in the State (there are a few exceptions). A listing of active contractors was obtained from the Department of Professional Regulation, Construction Industry Licensing Board and used to make Maps 3-1, 3-2, 3-3, 3-4, and 3-5. Each license number begins with two letters which designate the type of contractor license. With the exception of electrical contractors, the first letter indicates whether the license is Certified (by the State) or Registered (issued by the county and registered with the State). Electrical contractors are designated differently. ER is the Registered electrical contractor. The table below shows which contractors most closely are associated with the type of work category shown.

<u>I-O MODEL</u> <u>NEW CONSTRUCTION</u>	<u>LICENSE</u>	<u>S.I.C. CODE</u>
Residential: one-unit	CG, RG General CB, RB Building CR, RR Residen.	1521 General contractor -Single family
2-4 unit	SAME AS ABOVE	1522 General contractor -residential bldg. other than sing.fam.
Garden Apts.	SAME AS ABOVE	1522 other res.bldgs.
High Rise Apts.	CG, General	1522 General Contractor
Additions & Alter.	CG, RG, General CB, RB, Building	1521 General Contractor 1522 -S.F. & Resid. Bldg.
Hotel & motels	SAME AS ABOVE	1522 Other res.bldgs.

Dormitories/gp.hous.	SAME AS ABOVE	1522 Other res.bldgs
Industrial bldgs.	CG,RG General	1541 Indust.bldg.& warehs.
Office buildings	CG,RG General	1542 Non-res. n.e.c.
	CB,RB Building	
Warehouses	SAME AS ABOVE	1541 Indust.bldg & warehs.
Garage/svc.station	SAME AS ABOVE	1542 Non-res. n.e.c.
Stores & restaurants	SAME AS ABOVE	1542 Non-res n.e.c.
Religious buildings	SAME AS ABOVE	1542 Non-res. n.e.c.
Educational buildings	SAME AS ABOVE	1542 Non-res. n.e.c.
Hospitals	SAME AS ABOVE	1542 Non-res. n.e.c.
Residen. Institution	SAME AS ABOVE	1522 Other res. bldgs.
Amusement/recrea.bldg.	SAME AS ABOVE	1542 Non-res. n.e.c.
Other non-farm bldg.	SAME AS ABOVE	1542 Non-res. n.e.c.
Teleph/telegr.facil.	SAME AS ABOVE	1541 Indust.bldg.& warehs.
Railroads	SAME AS ABOVE	1629 Heavy const. n.e.c.
Elec.utility facil.	SAME AS ABOVE	1541 Indust.bldg.& warehs.
Gas utility facil.	SAME AS ABOVE	1541 Indust.bldg.& warehs.
Petroleum pipelines	CU Undergd.util.	1623 Water,sewer,util.line
Water supply facil.	CG,RG General	1541 Indust.bldg.& warehs.
	CB,RB Building	
Sewer sys. facil.	SAME AS ABOVE	1541 Indust.bldg.& warehs.
Local transit facil.	SAME AS ABOVE	1541 Indust.bldg.& warehs.
Highways & streets	-----	1611 Highway & street
Farm housing	CG,RG General	1521 Single family housing
	CB,RB Building	
Farm service facil.	SAME AS ABOVE	1541 Indust.bldg.& warehs.
Petroleum/gas wells	CU Undergd.Util.	1629 Heavy const. n.e.c.
Mineral exploration	-----	1629 Heavy const. n.e.c.
Mineral access struc	CG,RG General	1541 Indust.bldg.& warehs.
	CB,RB Building	
Military Facilities	SAME AS ABOVE	1522 Other res. bldgs.
		1541 Indust.bldg.& warehs.
Dams & Reservoirs	-----	1629 Heavy const. n.e.c.
Other conservation		
develop.facils	CG,RG General	1541 Indust.bldg.& warehs.
	CB,RB Building	
Other non-bldg.facil	-----	1629 Heavy const. n.e.c.

In addition to the new construction categories above, the I-O model includes mobile homes in its new construction analysis and has repair and maintenance construction categories in a separate analysis.

U.S. CENSUS DEFINITIONS AND ASSUMPTIONS

"For this census, a "construction establishment" was defined as a relatively permanent office or other place of business at

which or from which the usual business activities related to construction were conducted. A separate census report was required from each establishment but not from each construction site. Instead, the data for work at each site were included in the report from the appropriate office or branch office. Foreign construction activities were not included in this census."

"The 1982 estimates for establishments with paid employees in all of the construction industries are based on reports from a probability sample of approximately 172,000 establishments selected from a universe of about 498,000 construction establishments with payroll. The data obtained from the sample were weighted to represent all construction establishments with payroll."

"All data shown are based on current dollars for the years specified and have not been adjusted for inflation."⁵

U.S. CONSTRUCTION INDUSTRY DATA

Employment in construction (U.S.) has risen from 4,233,658 in 1977 to 4,234,887 for 1982, less than 1%.

Of 1982 employment in construction, 993,629 people were employed by General building contractors and operative builders (S.I.C. Code 15). Heavy construction, general contractors (S.I.C. Code 16) employed 852,065 people. Specialty trade contractors (S.I.C. Code 17) employed 2,389,193 people.⁶

Total construction receipts have risen from \$213,032,139,000 in 1977 to \$310,168,603,000 for 1982, approximately 46%.⁷

Net construction receipts, which is defined as total

construction receipts less payments for construction work subcontracted to others, were \$232,004,890,000 for 1982. Of this total general building contractors and operative builders claimed \$57,367,100,000; heavy construction general contractors claimed \$54,653,951,000; and specialty trade contractors claimed \$119,938,838,000.⁸

Value added is defined as all business receipts less payments for construction work subcontracted to others, and less payments for material, components, supplies, and fuels. In the case of operative builders receipts for the land portion are subtracted from "business receipts".

Construction industry value added was \$98,116,143,000 in 1977 and \$144,946,247,000 for 1982.⁹

II. MINING

MATERIALS AND USES

As pointed out in Chapter 2, mining in Florida is approximately 34 percent construction related. This section covers those materials and their uses.

Limestone is sedimentary rock made up of 50% or more of the minerals calcite (calcium carbonate) and dolomite (calcium magnesium carbonate), with calcite being the predominate mineral.¹⁰

Construction uses of limestone include; crushed stone for concrete aggregate and sewage filter beds, ground stone for

stucco, filler, and whiting, as a fluxing agent in metal smelting, as dimension stone, as a chemical raw material, as an abrasive, and in glassmaking and acid neutralization. Limestone is the basic raw material in the manufacture of portland cement and, of course, lime. It is used in the production of paint pigments. Limestone is sometimes used for roof gravel and in the production of concrete blocks.

"The largest percentage of limestone produced in Florida issued for road base. The limestone can be used as a surface treatment aggregate to improve unstabilized roads, as bituminous aggregate for road pavement, or more commonly as a limerock base and stabilized base material". Eighty eight percent (88%) of Florida's 1966 limestone production was for road base and concrete aggregate. For 1975 it was 87.2%.¹¹

Dolomite is defined as limestone containing more dolomite than calcite. High-grade refractory materials are made from dolomite. Another use for limestone and dolomite is rip rap to control erosion.

Coquina is mainly cemented mollusk shells held loosely together by a calcareous cement. It varies from a sandy limestone, to a calcareous sandstone, to unconsolidated sand and shells.

Harder layers of coquina have long been used as building stones. The most common use of coquina at present is for roadbase.

The fine to coarse quartz sand and the silica gravel found

in Florida are used in construction also as concrete aggregate and road base. In addition sand is used for aggregate in mortar, concrete block, and stucco.

MINING SITES

Aggregate limestone is mined in Dade, Broward, Palm Beach, Monroe, Collier, and Lee counties in South Florida, also in Okeechobee, Hernando, and Suwannee counties.

Soft-rock limestone accounts for approximately 63% of the total limestone output and is more evenly distributed over the State. The Ocala group of limestones are mined in Suwannee, Columbia, Gilchrist, Levy, Alachua, Marion, Sumter, Citrus, and Hernando counties. The Miami limestone group is mined south of the 28th degree parallel. Shell base of clam or oyster shells make up 80-90% of the beach ridge along the Atlantic coast, and to a lesser degree the sediments along the Manatee, Sarasota, and Charlotte county coasts. Marl occurs along all the coasts and along the deep stream cuts of Holmes, Washington, Walton, and Okaloosa counties of West Florida.

Dolomite is mined in Citrus, Jackson, Levy, and Taylor counties. Coquina is mined in Brevard, Orange, and Palm Beach counties.¹²

Most of the gravel produced in the State comes from dredging in the Flint River. Small deposits are found in Jackson, Escambia, and Santa Rosa counties. Sand mining is widely distributed over the State.

ECONOMIC FACTORS AND FUTURE TRENDS

The rapid growth in the limestone mining industry in the past is attributable to the increase in highway construction, the growth of the building construction industry, and an expansion in the chemical processing industries.

"The sharp downturn in production recorded in 1974 was directly attributable to a recession and consequent slowdown in the construction and road-building industries. Further reduction in limestone production in 1975 reflected this continued downward trend in the number of homebuilding and highway projects." 14

Demand for cement and crushed stone parallels demand for construction. Demand for cement more closely relates to building construction demand; and demand for crushed stone more closely relates to the demand for highway and street construction.

The demand for construction minerals in Florida should show moderate growth for the foreseeable future. The continued growth in building construction and the more moderate growth in highway and street construction should form the basis for the continuing demand for these minerals.

III. SINGLE FAMILY RESIDENTIAL & OPERATIVE BUILDERS

CENSUS DATA

In this section both Single family residential contractors, S.I.C. Code 1521, and Operative builders, S.I.C. Code 1531, are discussed.

Florida employment, total receipts, and value added comparisons are made in the following paragraphs for the years 1977 and 1982. It should be kept in mind that inflation is not factored out of the dollar values reported. The Bureau of the Census, new one-family house excluding lot value construction cost index, for example, shows a 68.2% increase from the 1977 level=100 to the 1985 level=168.2.¹⁵ Engineering News Record, ENR, gives a cost index for buildings of 157.5 for 1985 with 1977=100.¹⁶ The consumer price index during the same period rose from 181.5 to 322.1, an increase of 77.5%.¹⁷

The "General Contractors - Single-Family Houses" category, is defined as establishments engaged primarily in the construction of single-family houses, rowhouses, and townhouses (including new work, additions, alterations, remodeling, and repair).

Employment by this category of general contractors decreased 2.7% from its 1977 level of 22,381 people to a 1982 level of 21,766.¹⁸

Florida single family contractors had total receipts in 1982 of \$1,739,372,000 up 36% from \$1,274,727,000 for 1977. Net receipts for 1982 were \$1,240,821,000. Value added was \$690,951,000 for 1982 up 58.6% from its 1977 level of \$435,541,000.¹⁹

"Operative Builders" are defined as establishments primarily engaged in the construction of single-family houses and other buildings for sale on their own account rather than as contractors. This group includes speculative builders and

condominium developers.

Florida operative builders employed 14,106 people in 1982, a decrease of 10.9% from their 1977 employment of 15,837.²⁰

Total construction receipts rose 53.6% from their 1977 level of \$1,304,402,000 to a 1982 level of \$2,004,320,000. Net receipts for 1982 were \$1,082,843,000. Value added for 1982 was \$736,875,000 up 123% from the 1977 total of \$330,528,000.²¹

ECONOMIC NATURE

Single family contracting, and operative building are the

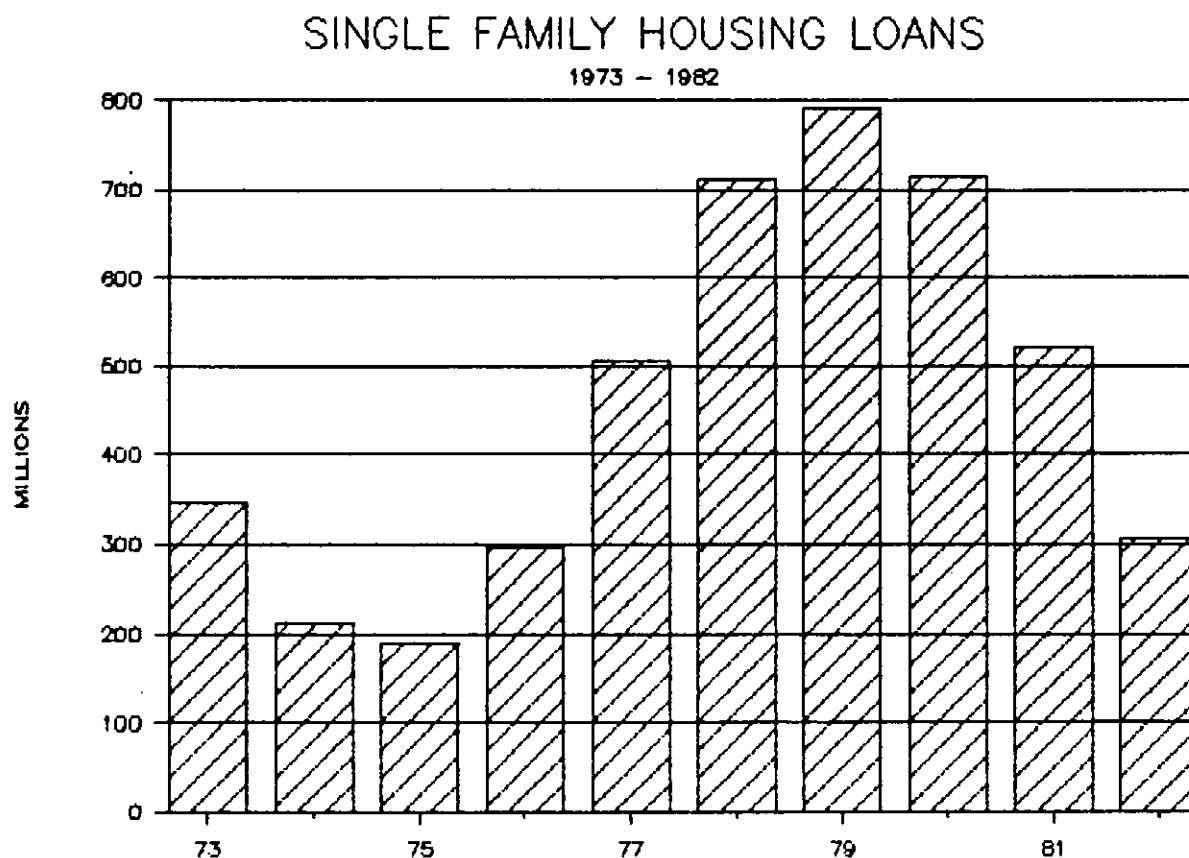


FIGURE 3-3

most consumer oriented sectors of the construction industry. They are also the most affected by changes in consumer economics. Table 3-3 lists the amounts and Figure 3-3 graphs the trend in single family housing loans from 1973. Note the dip in the 1974-76 recession and the decline from 1979 through 1982. Nearly all new single family housing requires financing. Single family

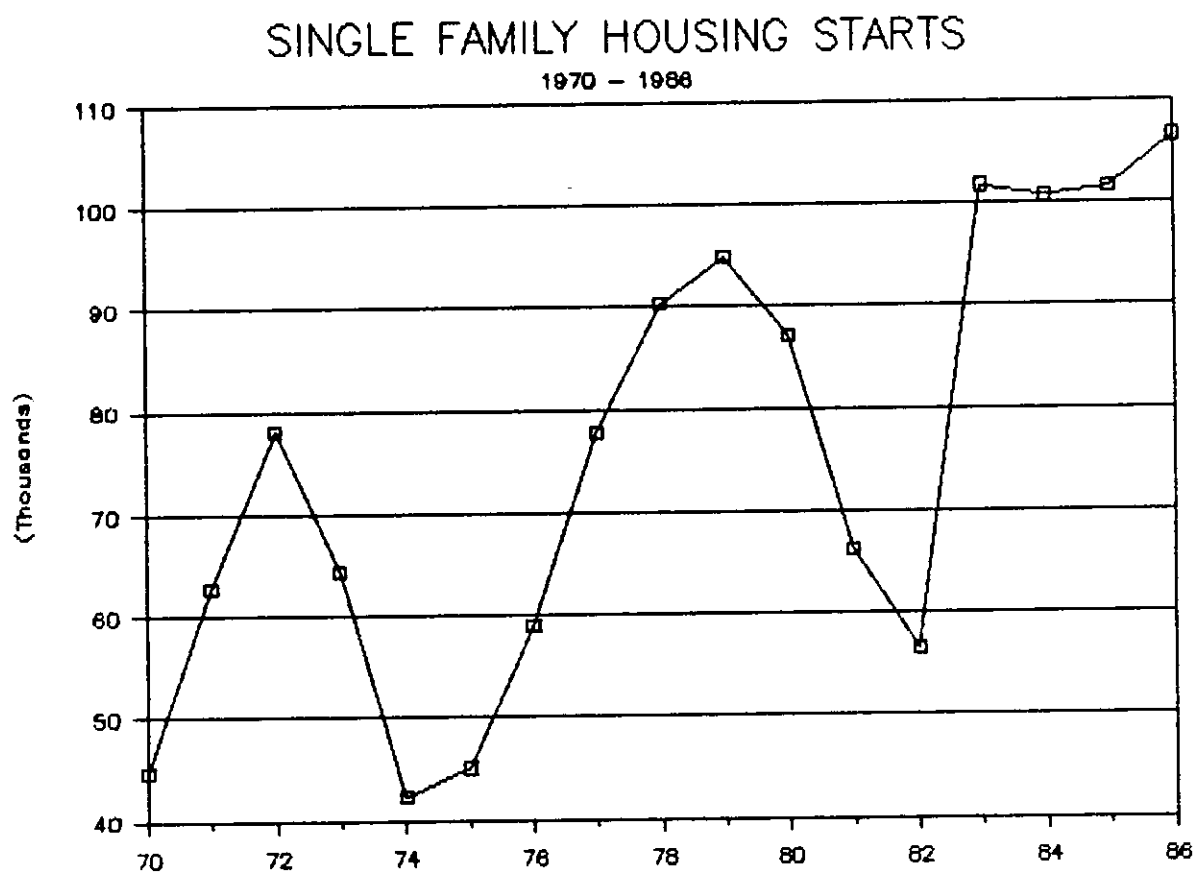


FIGURE 3-4

housing starts are shown in Figure 3-4. Compare the two figures and note the trends in corresponding years. The yearly percent changes in starts and loans were calculated and graphed together

in Figure 3-5. The correlation is obvious.

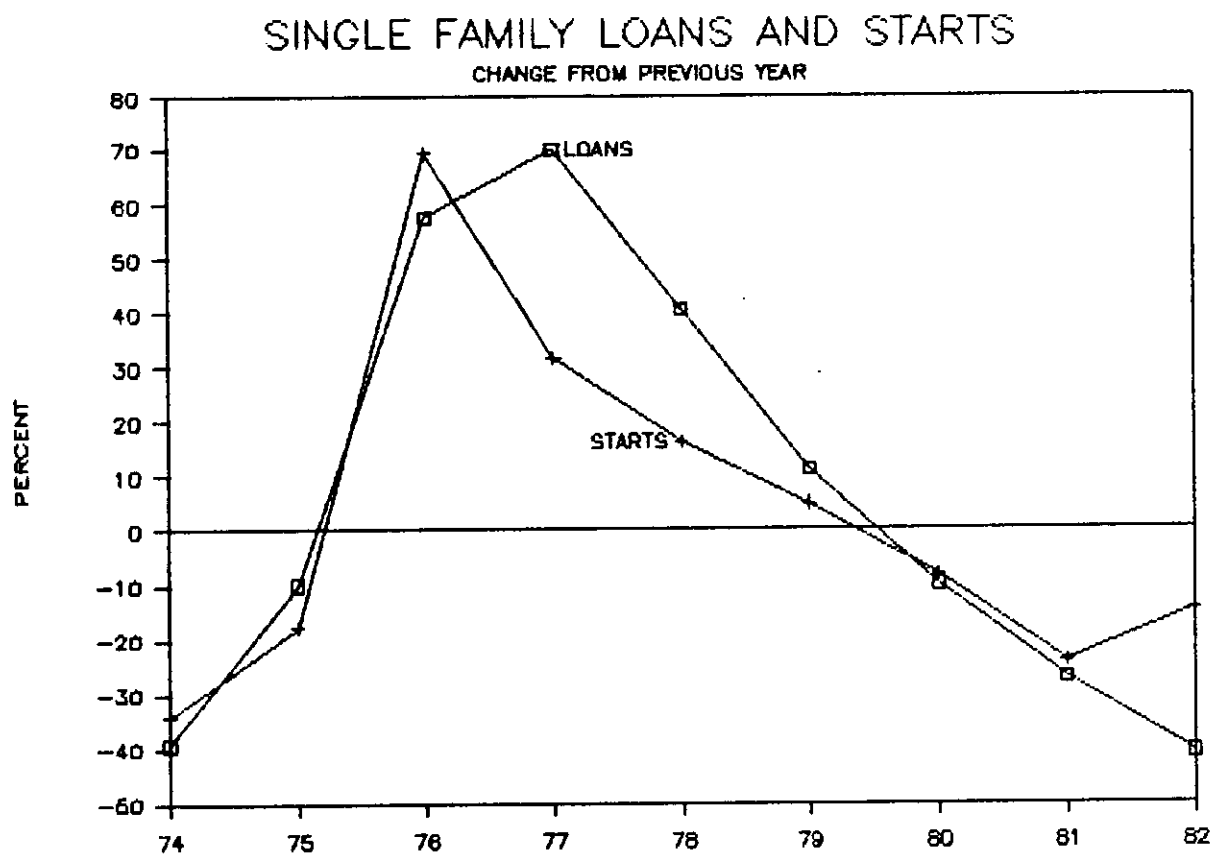


FIGURE 3-6

The recession, high interest rates, and inflation slowed population migration to Florida from 1979 through 1982. One of the major causes for this slowdown is found in the decreasing affordability of housing during that period of time. Table 3-4 shows the "Housing Affordability Index" as derived by the National Association of Realtors. It shows the effect of decreasing interest rate on the ability of median family income to afford mortgage payments. This index has been steadily increasing since

1982 as average mortgage interest rates have decreased from a high of 15.38% in 1982 to an average rate of 10.25% for 1986.

Single family and operative builder construction activity affects many other sectors of the economy. According to the Florida Home Builders Association, money received by this sector is in turn paid out for construction costs in the following approximate ratios:²⁷

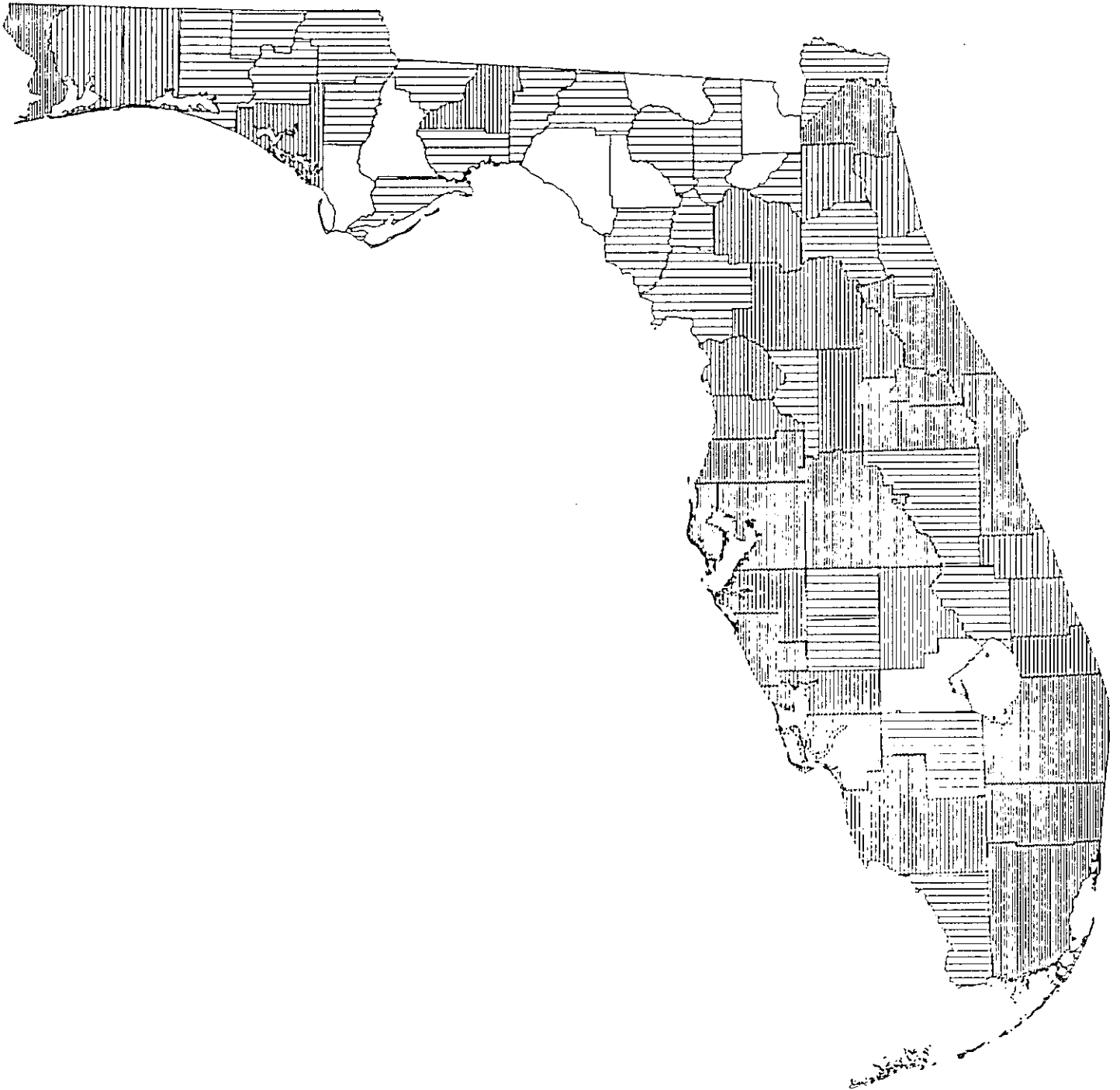
Construction labor	4 percent
Lot costs	16 percent
Subcontracted labor	19 percent
Materials	34 percent
Financing	27 percent

Buying a home may act as a catalyst for other purchases. The following chart shows the number of new home buyers out of 100 that are planning to purchase the listed items:

Drapes	95
Furniture	93
Landscaping material (over \$1000)	89
Power tools	65
Decorating changes	62
Additions or improvements	61
Washer and/or dryer	59
Fencing	56
Major kitchen appliances	32
Gourmet cooking accessories	32

RESIDENTIAL CONTRACTORS 29

(CR,RR)



CONTRACTORS

LESS THAN 10
100 TO 149

10 TO 49
150 TO 299

50 TO 99
300 AND UP

CONTRACTOR DISTRIBUTION & LEADING HOUSING MARKETS

Map 3-1 shows the distribution of active licensed residential contractors in Florida. Florida license law lets holders of the residential license build up to two stories and up to three unit residential structures. General contractors and building contractors may also build these structures so Map 3-1 may not accurately reflect the numbers on contractors involved in single family home construction.

Florida had four areas in the nations top twenty housing markets for 1986. Housing starts as reflected in the combined number of single family and multifamily permits issued and rank for 1986 are shown below.³⁰

9.	Tampa/St. Petersburg	29,572
14.	W. Palm Beach/Boca Raton	23,109
18.	Orlando	20,029
20.	Ft. Lauderdale/Hollywood	19,126

IV. GENERAL BUILDING CONTRACTORS - OTHER THAN SINGLE FAMILY

RESIDENTIAL OTHER THAN SINGLE FAMILY

The Bureau of the Census defines this category as establishments engaged primarily in the construction of apartment buildings, hotels, motels, and dormitories (including new work, additions, alterations, remodeling, and repair).

Florida employment by firms in this category rose 96.4% from the 1977 level of 3,970 people to a 1982 level of 7,800.³¹

Total receipts for Florida contractors in this group during 1982 were \$1,044,509,000 up 273% from \$278,699,000 for 1977. Net receipts for 1982 were \$458,364,000. Value added was \$262,230,000 for 1982 up 266% from its 1977 level of \$71,613,000.³²

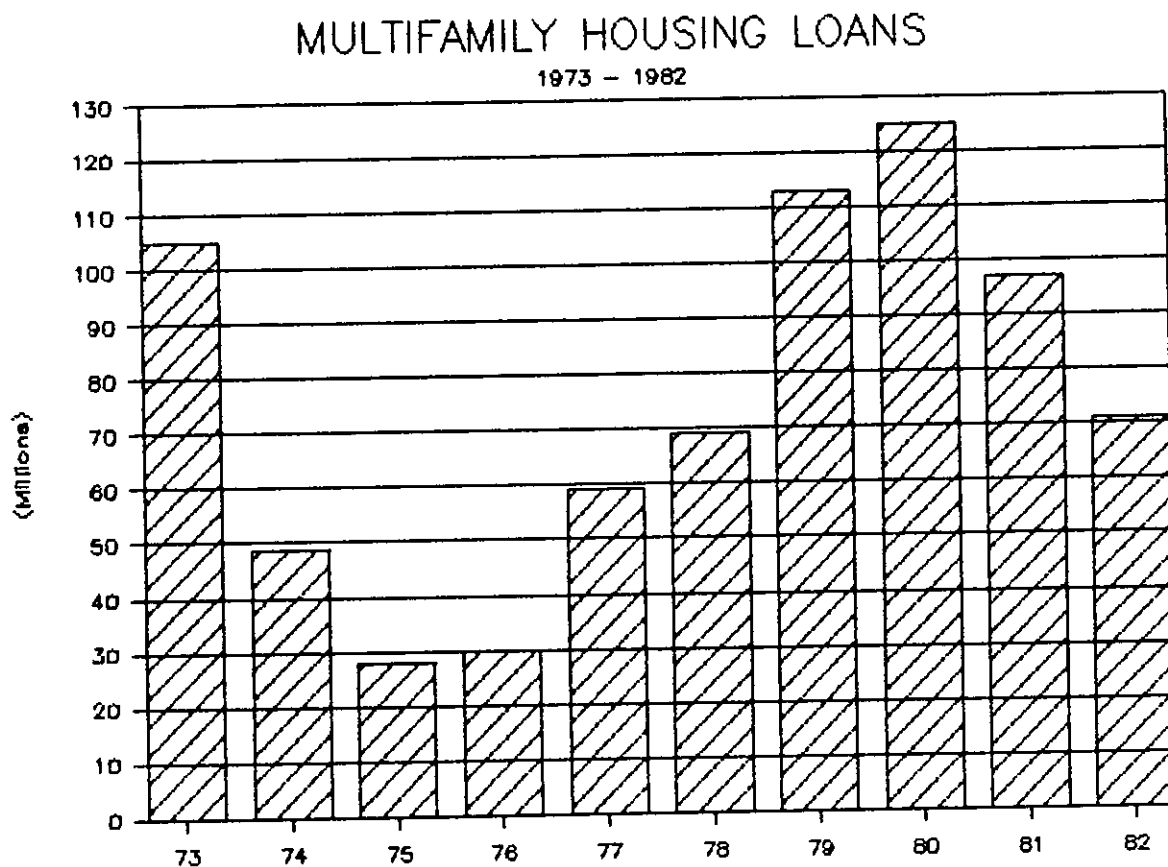


FIGURE 3-6

Figures 3-6 and 3-7 will not show a parallel increase in loans and starts for multi-family housing at first glance. A resolution of this apparent inconsistency is given by a closer look at what each source of information is reporting. Figures

3-6 and 3-7 are loans and "starts" which are reported at beginning of project. The census data is "receipts" which occur after work is accomplished. If starts and loans for 1976 and 1981 are compared with receipts for 1977 and 1982 respectively, the correlation holds true.

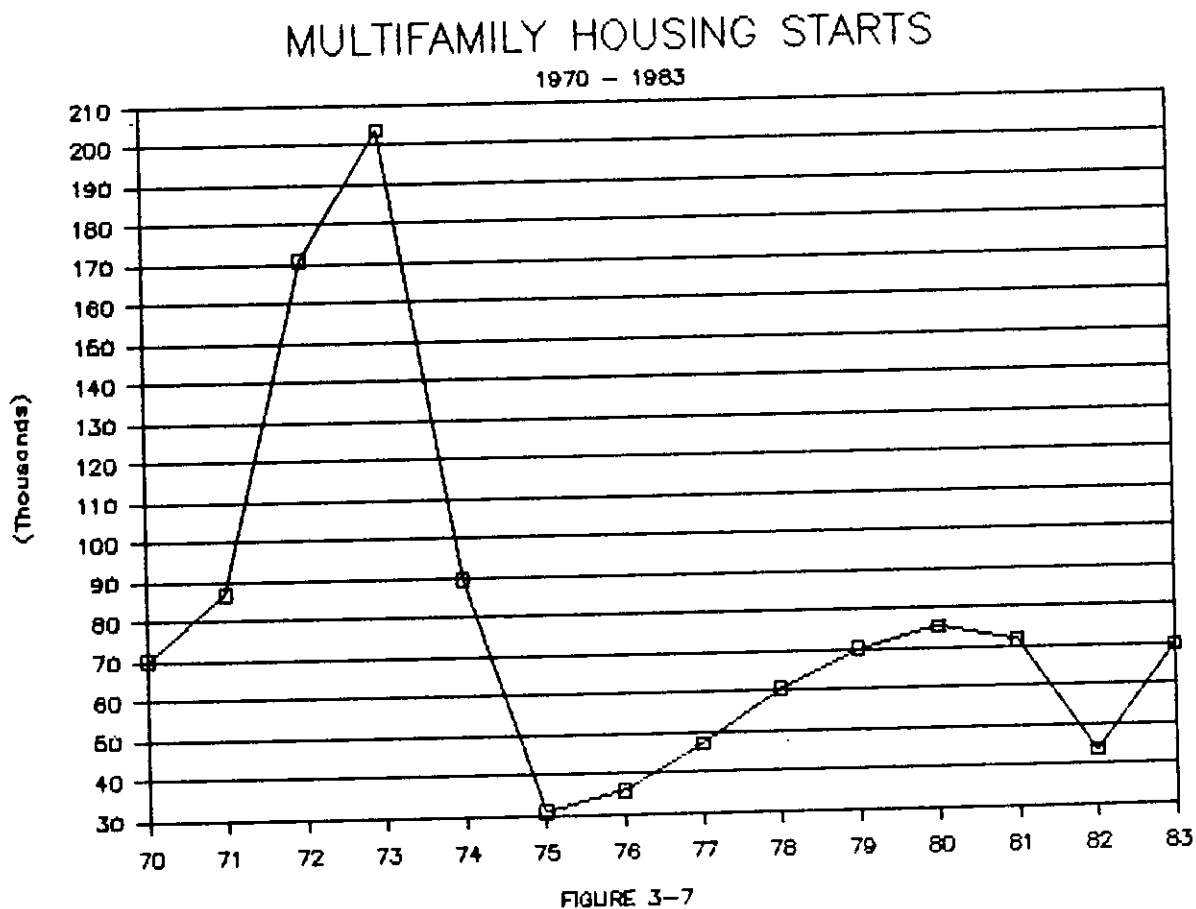


Figure 3-8 shows the relationship between financing and starts for multi-family construction.

MULTIFAMILY LOANS AND STARTS

1970 - 1982

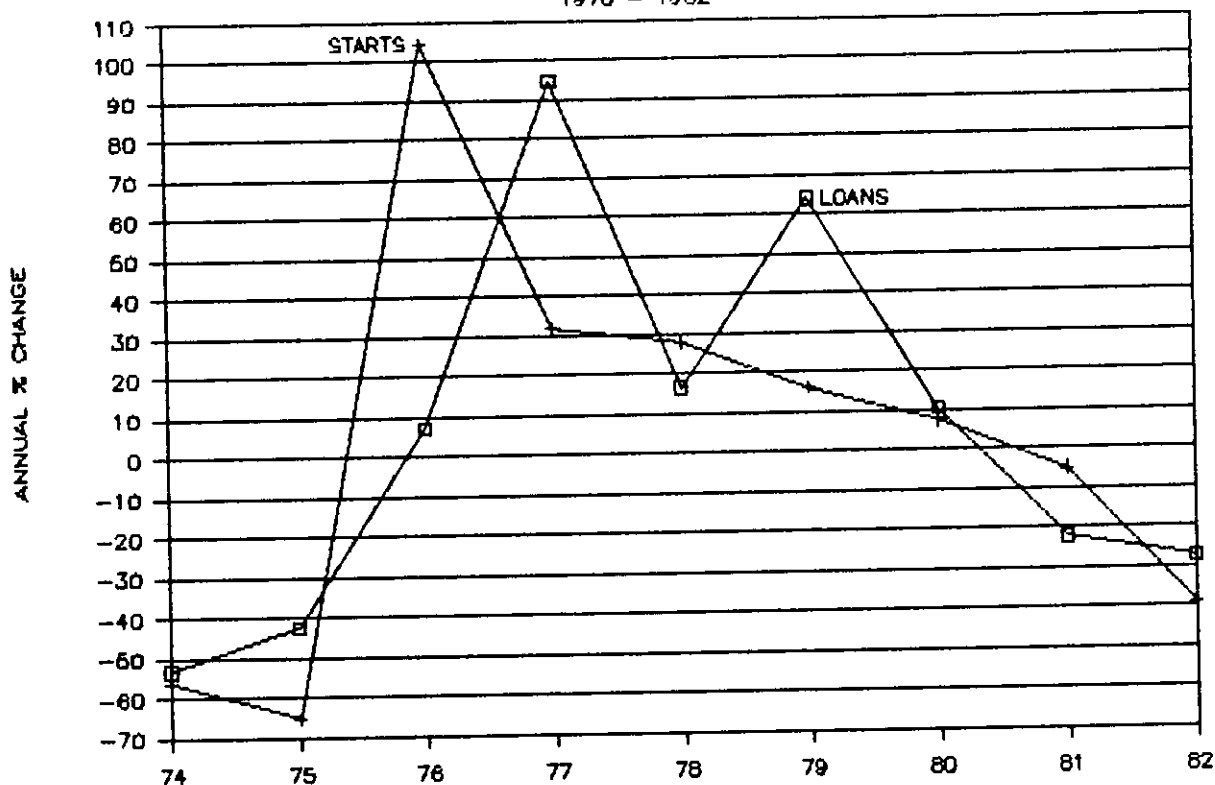


FIGURE 3-B

NON RESIDENTIAL OTHER THAN INDUSTRIAL & WAREHOUSE

This category consists of establishments engaged primarily in the construction of commercial, institutional, religious, and amusement and recreational buildings (including new work, additions, alterations, remodeling, and repair).

This non-residential category employed 20,683 people in 1982, an increase of 91.0% from its 1977 employment of 10,827.³⁶

Total construction receipts rose 205% from their 1977 level of \$817,757,000 to a 1982 level of \$2,501,439,000. Net receipts

for 1982 were \$1,093,518,000. Value added for 1982 was \$600,529,000 up 226% from the 1977 value added of \$184,105,000.³⁷

INDUSTRIAL & WAREHOUSE

Establishments in this category are primarily engaged in the construction of industrial buildings such as aluminum plants, automobile assembly plants, pharmaceutical manufacturing plants, and commercial warehouses (including new work, additions, alterations, remodeling, and repair).

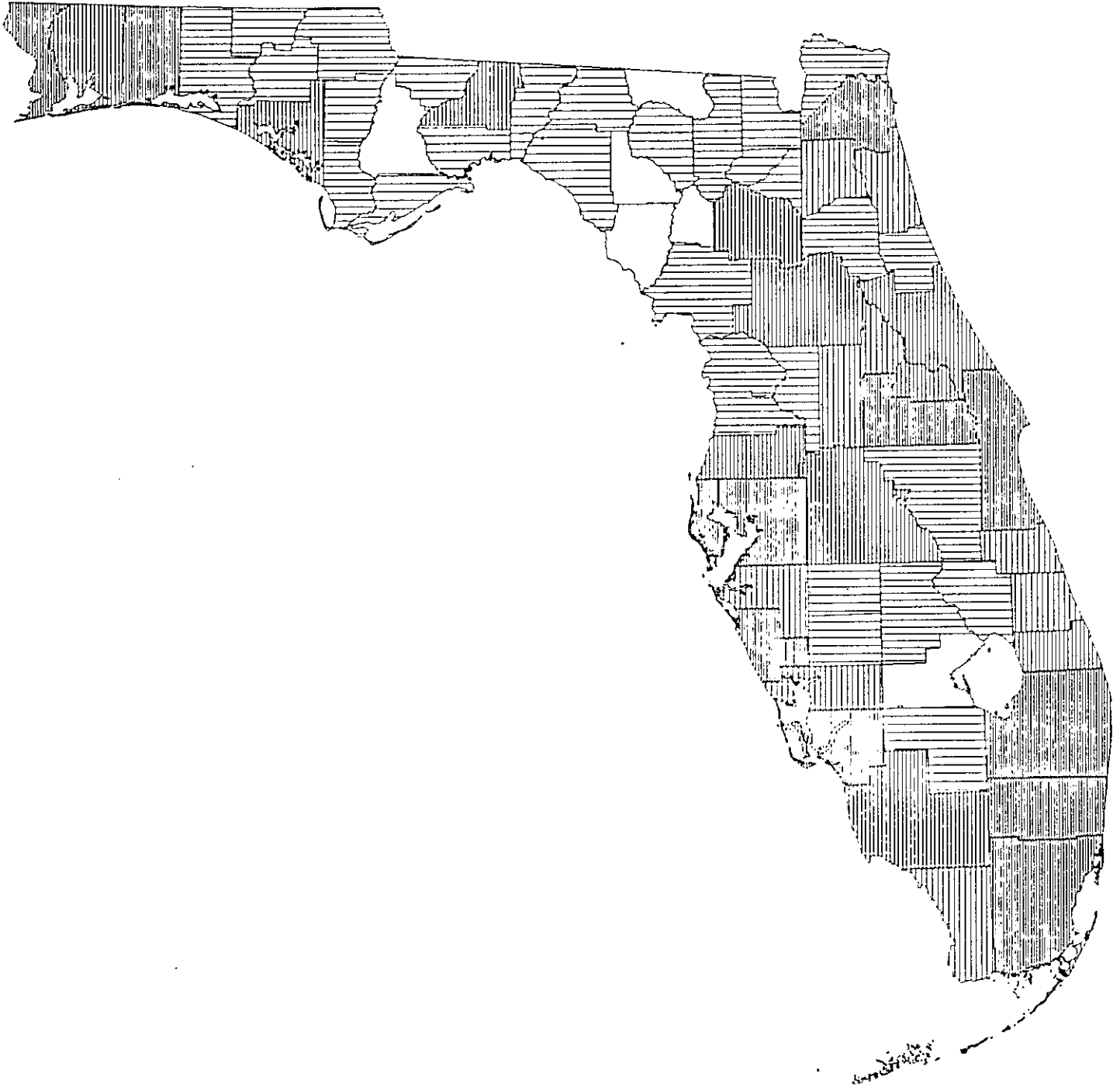
Florida industrial and warehouse contractors employed 5,036 people in 1982, a decrease of 2.5% from their 1977 employment of 5,165.³⁸

Total construction receipts rose 66.8% from their 1977 level of \$302,999,000 to a 1982 level of \$505,501,000. Net receipts for 1982 were \$248,643,000. Value added for 1982 was \$125,992,000 up 121% from the 1977 total of \$57,017,000.³⁹

Map 3-2 shows the distribution of contractors holding "general contractor" and "building contractor" licenses in Florida. Building contractors are limited to construction of buildings no more than three stories in height. Although these contractors may be involved in single family residential construction, they are linked more closely with non-residential building construction including industrial and warehouse. See Table 3-5 for the number of CG, RG, CB, & RB licenses per county.

GENERAL CONTRACTORS & BUILDERS₄₀

(CG, RG, CB, RB)



CONTRACTORS

LESS THAN 25
250 TO 449

25 TO 99
500 TO 999

100 TO 249
1000 AND UP

V. HEAVY CONSTRUCTION

This category consists of three subcategories: Bridge, tunnel, and elevated highway (S.I.C. 1622); Water, sewer, pipeline, communication and power line (S.I.C. 1623); and, Heavy construction contractors N.E.C. (S.I.C. 1629).

BRIDGE, TUNNEL, & ELEVATED HIGHWAY

These construction contractors are those establishments that are engaged primarily in the construction of bridges, viaducts, elevated highways; and highway, pedestrian, and railway tunnels.

These bridge and tunnel contractors employed 1,728 people in 1982, an increase of 90.7% from their 1977 employment of 906.

Total construction receipts for bridge and tunnel contractors rose 215% from their 1977 level of \$41,329,000 to a 1982 level of \$130,498,000. Net receipts for 1982 were \$110,500,000. Value added for 1982 was \$71,987,000 up 316% from the 1977 value added of \$17,296,000.⁴²

WATER, SEWER, PIPE LINE, COMMUNICATION, & POWER LINE

Water, sewer, etc. construction contractors are defined as those establishments engaged primarily in the construction of pipe lines, communication and power lines, and sewer and water mains. This group also includes contractors engaged in construction of pumping stations, television and radio towers, and telephone lines. This category of heavy contractors employed 10,694 people in 1982, an increase of 42.4% from their 1977

employment of 7,510.⁴³

Total construction receipts for water, sewer, etc. contractors rose 111% from their 1977 level of \$292,698,000 to a 1982 level of \$619,184,000. Net receipts for 1982 were \$515,465,000. Value added for 1982 was \$321,207,000 up 106% from the 1977 total of \$155,791,000.⁴⁴

HEAVY CONSTRUCTION CONTRACTORS, N.E.C.

This category of contractors are those establishments primarily engaged in heavy construction projects not elsewhere classified, (N.E.C.), such as construction of chemical complexes, dams and reservoirs, harbor and port facilities, missile facilities, oil refineries, subways, water and sewage treatment plants, light and power plants, industrial ovens and incinerators, flood control projects, and dredging and demolition contractors.

Florida heavy construction contractors N.E.C. employed 8,549 people in 1982, an increase of 12.1% from their 1977 employment of 7,626.⁴⁵

Total construction receipts for this group rose 38.2% from their 1977 level of \$471,929,000 to a 1982 level of \$652,163,000. Net receipts for 1982 were \$553,456,000. Value added for 1982 was \$385,794,000 up 81.7% from the 1977 total of \$212,302,000.⁴⁶

There is no "heavy contractor" licensing requirement in Florida. The only related licensing requirement is for "underground utilities contractor". The distribution of

underground utilities contractors is shown by Map 3-3. Duval county leads with eleven CU licensed contractors. Broward county is next with ten. See Table 3-5 for the number of licenses per county.

VI. HIGHWAY & STREET

Highway and street construction contractors are those primarily engaged in the construction of roads, streets, alleys, sidewalks, guardrails, parkways, parking areas, airports, and athletic fields.

These contractors employed 11,806 people in 1982, a decrease of 4.6% from their 1977 employment of 12,376.⁴⁸

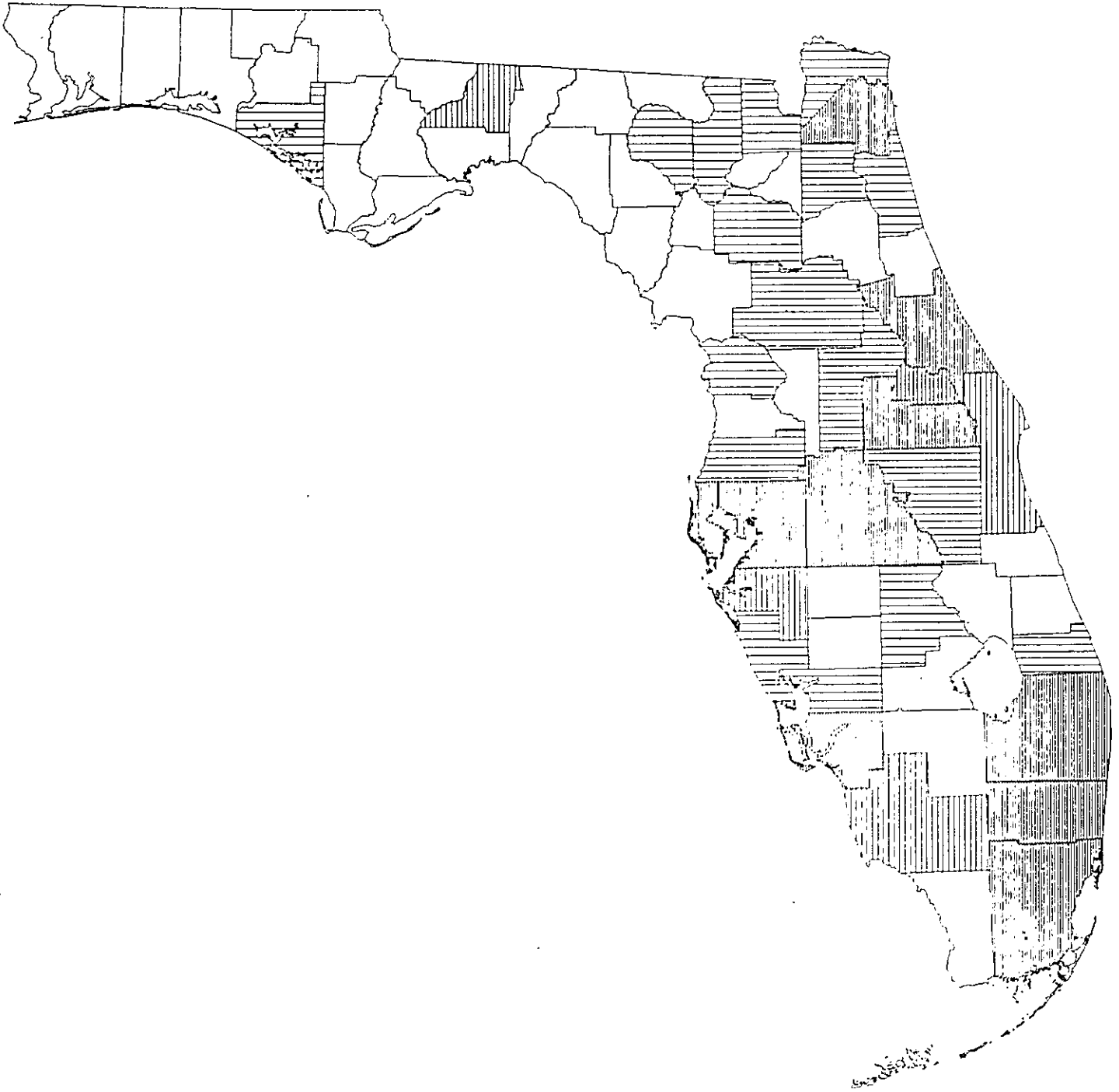
Total construction receipts rose 46.4% from their 1977 level of \$597,128,000 to a 1982 level of \$874,425,000. Net receipts for 1982 were \$687,197,000. Value added for 1982 was \$407,518,000 up 52.8% from the 1977 value added of \$266,601,000.⁴⁹

VII. PLUMBING, HEATING, AIR CONDITIONING

These special trade contractors are engaged in plumbing, heating (except electric), or air conditioning work or any combination of these types of work. Sheet metal work combined with any of these types of work is included in this industry, but roofing and sheet metal contractors are not.

UNDERGROUND UTILITY CONTRACTORS⁴⁷

(CU)



CONTRACTORS

NONE
5 TO 6

1 TO 2
7 TO 8

3 TO 4
9 AND UP

Plumbing, heating, and air conditioning contractors employed 33,580 people in 1982, an increase of 53.7% from their 1977 employment of 21,809.⁵⁰

Total construction receipts rose 126% from their 1977 level of \$825,354,000 to a 1982 level of \$1,867,327,000. Net receipts for 1982 were \$1,693,157,000. Value added for 1982 was \$918,290,000 up 128% from the 1977 total of \$403,149,000.⁵¹

Map 3-4 shows the distribution of CM, RM, CA, RA, CF, RF, CS, and RS licenses. Table 3-5 gives the number of licenses for each county.

VIII. ELECTRICAL

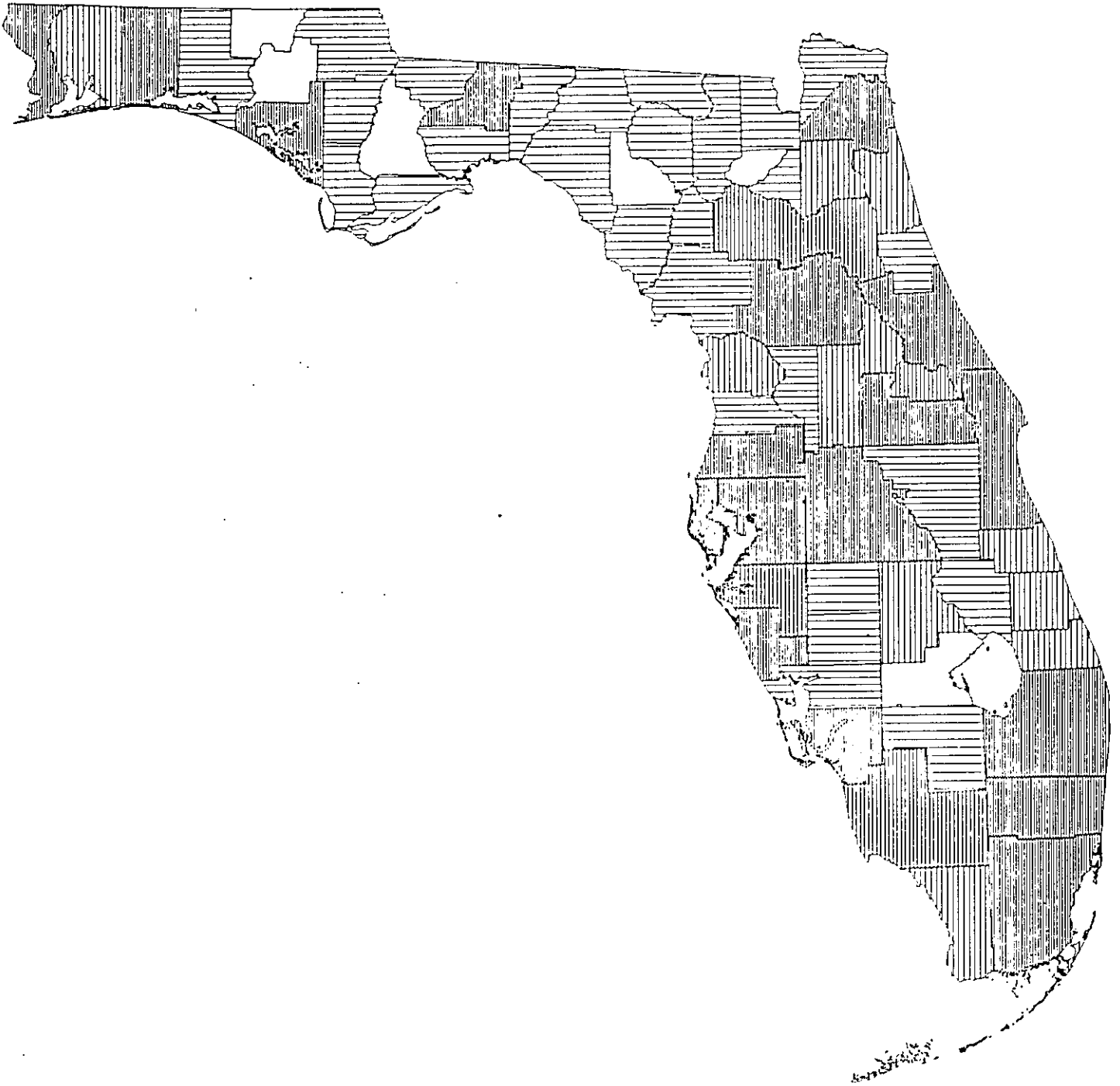
Electrical contractors are those establishments primarily engaged in electrical work at the construction site. This industry also includes electric heating contractors and establishments engaged in the installation of intercommunication equipment, sound equipment, burglar alarms, fire alarms, and telephones.

Electrical contractors in Florida employed 25,689 people in 1982, an increase of 41.2% from their 1977 employment of 18,191.⁵³

Total construction receipts rose 106% from their 1977 level of \$615,518,000 to a 1982 level of \$1,267,293,000. Net receipts for 1982 were \$1,241,265,000. Value added for 1982 was \$699,835,000 up 102% from the 1977 total of \$346,658,000.⁵⁴

PLUMBING & MECHANICAL CONTRACTORS⁵²

(CM, RM, CA, RA, CF, RF, CS, RS)



CONTRACTORS

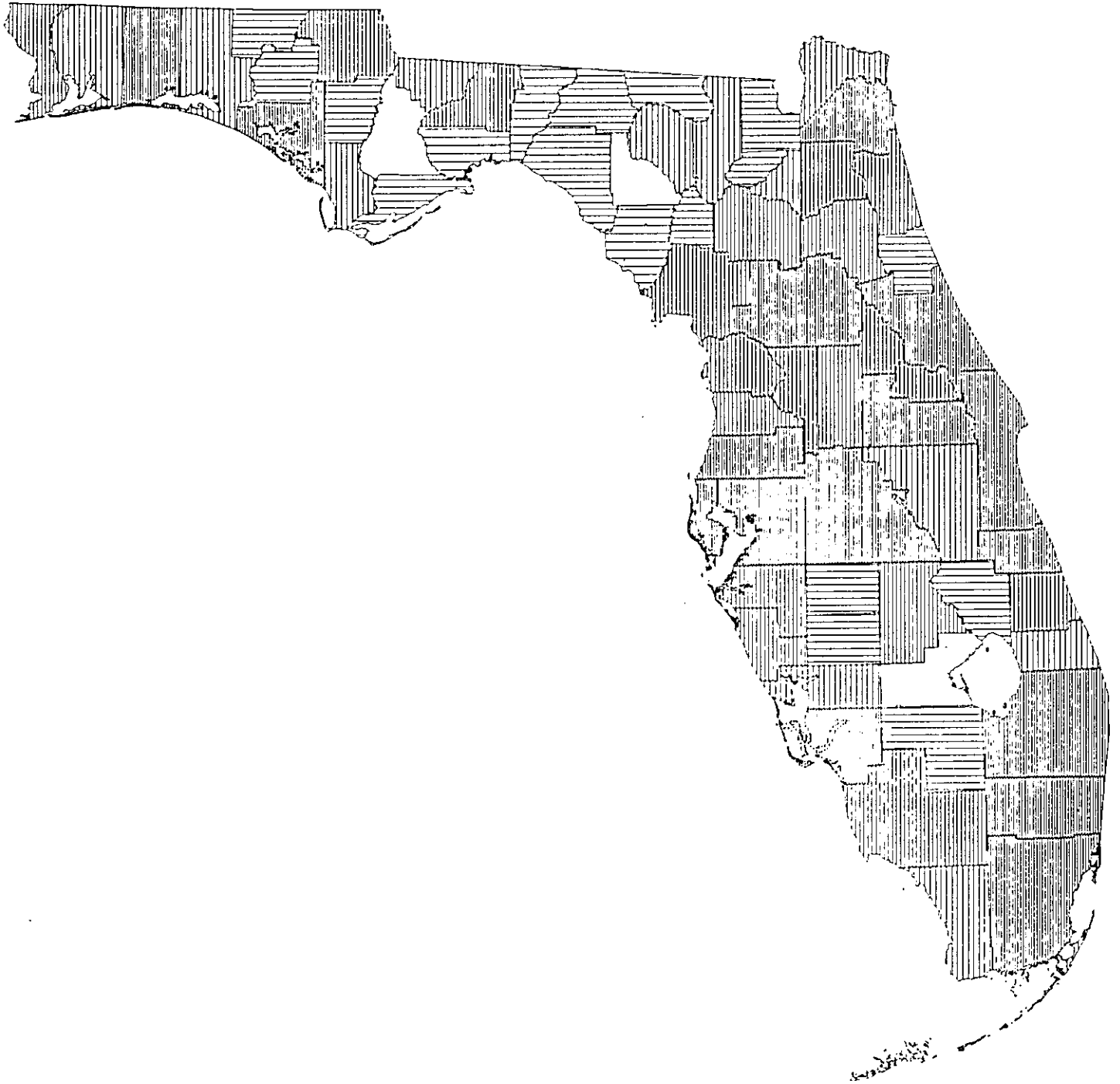
LESS THAN 10
100 TO 199

10 TO 49
200 TO 299

50 TO 99
300 AND UP

ELECTRICAL CONTRACTORS

(ER,EC) 55 71



CONTRACTORS

LESS THAN 10
50 TO 99

10 TO 24
100 TO 299

25 TO 49
300 AND UP

Map 3-5 shows the distribution of EC and ER licensed contractors throughout the State. Table 3-5 gives the number of licenses per county.

IX. ROOFING AND SHEET METAL

This category consists of those contractors primarily engaged in the installation of siding and roofing (including of spraying, painting, or coating). This industry also includes contractors engaged in sheet metal work, except that done in connection with plumbing, heating, or air conditioning.

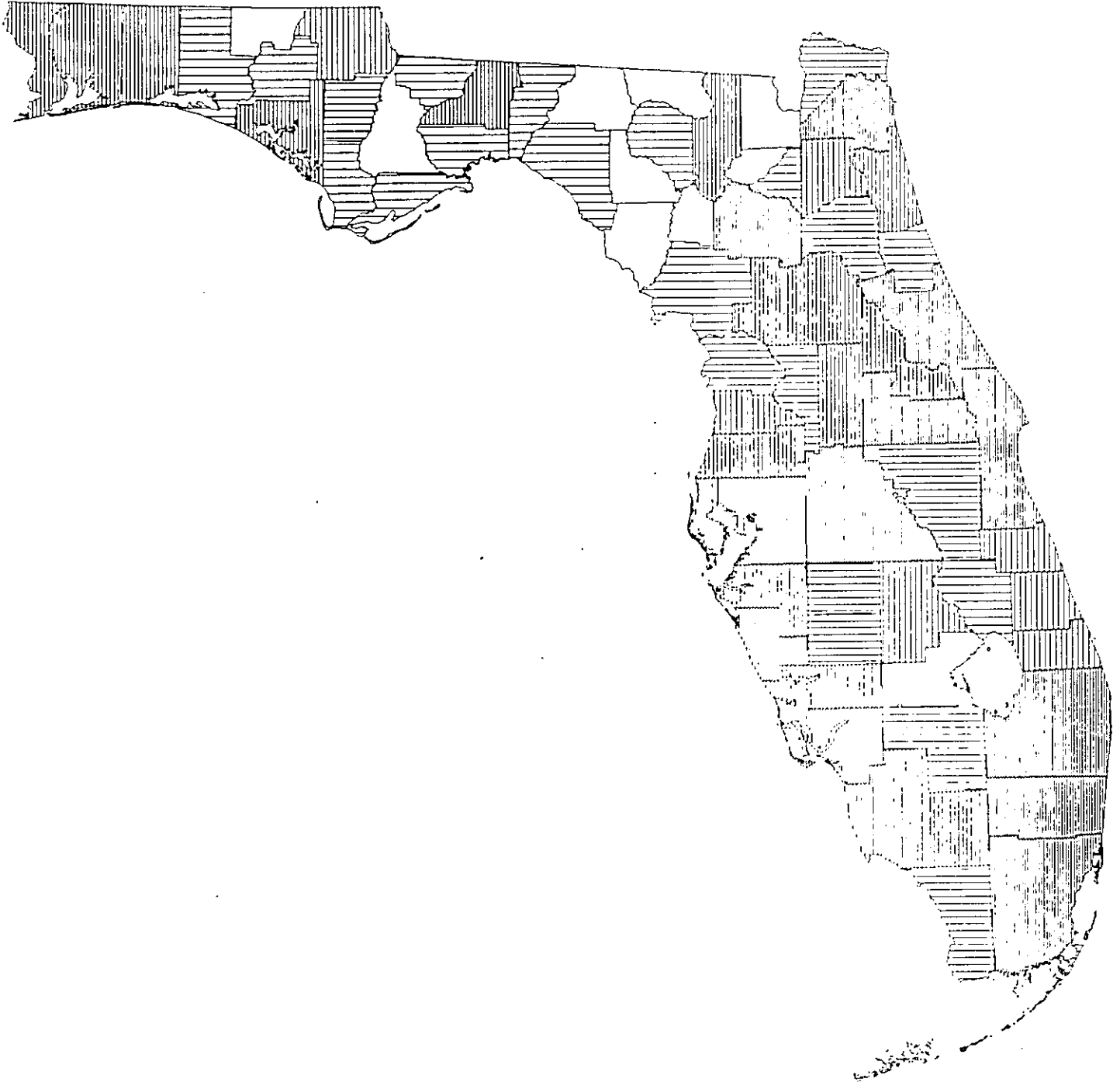
Florida roofing and sheet metal contractors employed 14,931 people in 1982, an increase of 65.5% from their 1977 employment of 9,018.⁵⁶

Total construction receipts for this industry rose 139% from their 1977 level of \$273,759,000 to a 1982 level of \$653,002,000. Net receipts for 1982 were \$624,705,000. Value added for 1982 was \$348,239,000 up 138% from the 1977 total of \$146,795,000.⁵⁷

Map 3-6 shows the distribution of CC and RC contractor licenses in the State. Table 3-5 gives numbers of licenses per county.

ROOFING CONTRACTORS 58

(CC,RC)



CONTRACTORS

LESS THAN 5
30 - 49

5 TO 14
50 TO 149

15 TO 29
115 AND UP

X. MASONRY, STONE, PLASTERING, TERRAZZO, TILE, & MARBLE

Three S.I.C. categories make up this group: Masonry, stone setting, and other stonework (S.I.C. 1741), Plastering, drywall, acoustical and insulation work (S.I.C. 1742), and Terrazzo, tile, marble, and mosaic work (S.I.C. 1743).

MASONRY, STONE SETTING, & OTHER STONEMWORK

The masonry category consists of contractors primarily engaged in masonry work, stone setting and other stonework, including boiler setting contractors, bricklaying contractors, cement block laying contractors, chimney construction contractors, exterior marble work contractors, and tuck pointing contractors.

These contractors employed 7,272 people in 1982, an increase of 5.7% from their 1977 employment of 6,879.59

Total construction receipts for masonry contractors rose 58.3% from their 1977 level of \$130,165,000 to a 1982 level of \$206,000,000. Net receipts for 1982 were \$194,363,000. Value added for 1982 was \$121,085,000 up 49.2% from the 1977 total of \$84,709,000.⁶⁰

PLASTERING, DRYWALL, ACOUSTICAL, & INSULATION WORK

These contractors are the second category in the grouping for this study. Contractors in this category are those primarily engaged in applying plaster, plain or ornamental; the installation of lathing or other appurtenances to receive

plaster; or in drywall, acoustical, and building insulation work.

These plaster, drywall, etc. contractors employed 15,247 people in 1982, an increase of 68.7% from their 1977 employment of 9,032.⁶¹

Total construction receipts rose 135% from their 1977 level of \$263,660,000 to a 1982 level of \$619,247,000. Net receipts for 1982 were \$570,377,000. Value added for 1982 was \$344,908,000 up 135% from the 1977 value added of \$147,076,000.⁶²

TERRAZZO, TILE, MARBLE, & MOSAIC WORK

The third category included in the grouping is composed of contractors engaged primarily in setting and installing ceramic tile, marble, and mosaic, and in mixing marble particles and cement to make terrazzo at the site of construction. This category also includes contractors engaged in fresco work and mantel work.

These tile, marble, etc. contractors employed 2,465 people in 1982, an increase of 17.3% from their 1977 employment of 2,091.⁶³ Total construction receipts rose 69.1% from their 1977 level of \$60,164,000 to a 1982 level of \$101,768,000. Net receipts for 1982 were \$98,273,000. Value added for 1982 was \$53,358,000 up 71.1% from the 1977 total of \$31,192,000.⁶⁴

XI. CONCRETE WORK

Contractors in this category are primarily engaged in

concrete work and the surfacing of concrete floors, applying seal to concrete or asphalt surfaces, constructing with gunite and stucco, and constructing private driveways and walks of all materials.

Concrete contractors employed 10,565 people in 1982, an increase of 83.4% from their 1977 employment of 5,759.⁶⁵

Total construction receipts rose 282% from their 1977 level of \$130,403,000 to a 1982 level of \$497,610,000. Net receipts for 1982 were \$437,825,000. Value added for 1982 was \$271,726,000 up 228% from the 1977 total of \$82,789,000.⁶⁶

XII. SPECIAL TRADE CONTRACTORS N.E.C.

This group consists of specialty trades which have not elsewhere been classified. The U.S. census classifies the contractors shown before under headings VII. through XI. as special trade contractors. For this study, however, those contractors have been treated separately. The following sections cover the remaining special trade contractors.

PAINTING, PAPER HANGING, & DECORATING

These contractors (S.I.C. 1721) are engaged in interior and exterior painting (except roofs), paper hanging, and decorating.

Their 1982 employment was 8,860, a 34.8% increase over the 1977 employment of 6,570.⁶⁷

Total construction receipts rose 77.6% from \$139,377,000 for

1977 to \$247,492,000 for 1982. Net receipts were \$222,964,000 for 1982. Value added increased 66.0% from \$97,328,000 for 1977 to \$161,616,000 for 1982.⁶⁸

CARPENTERING

These contractors (S.I.C. 1751) are engaged in carpentry work and installation of prefabricated windows and doors (except revolving doors). Ship joinery contractors are included.

Their 1982 employment was 8,000, a 36.6% increase over their 1977 employment of 5,856.⁶⁹

Total construction receipts rose 107% from \$122,447,000 for 1977 to \$253,616,000 for 1982. Net receipts were \$227,062,000 for 1982. Value added increased 83.7% from \$77,169,000 for 1977 to \$141,731,000 for 1982.⁷⁰

FLOOR LAYING & OTHER FLOORWORK

These contractors (S.I.C. 1752) are engaged in laying, scraping, finishing, or refinishing of parquet and other hardwood flooring. This industry also includes contractors that install asphalt tile, linoleum, and mastic and resilient flooring.

Their 1982 employment was 1,295, a 3.1% increase from their 1977 employment of 1,255.⁷¹

Total construction receipts rose 1.8% from \$50,563,000 for 1977 to \$51,453,000 for 1982. Net receipts were \$47,718,000 for 1982. Value added increased 21.2% from \$20,173,000 for 1977 to \$24,449,000 for 1982.⁷²

WATER WELL DRILLING

These contractors (S.I.C. 1781) are engaged in water well drilling and servicing water wells.

Their 1982 employment was 1,055, a 17.7% increase over their 1977 employment of 896.⁷³

Total construction receipts rose 60.4% from \$36,076,000 for 1977 to \$57,853,000 for 1982. Net receipts were \$56,143,000 for 1982. Value added increased 57.4% from \$19,823,000 for 1977 to \$31,200,000 for 1982.⁷⁴

STRUCTURAL STEEL ERECTION

These contractors (S.I.C. 1791) are engaged in the erection of structural steel, the placing of concrete reinforcement and structural iron work, and the erection of metal storage tanks.

Their 1982 employment was 3,581, a 66.3% increase over their 1977 employment of 2,154.⁷⁵

Total construction receipts rose 172% from \$61,439,000 for 1977 to \$167,130,000 for 1982. Net receipts were \$154,467,000 for 1982. Value added increased 217% from \$34,107,000 for 1977 to \$108,045,000 for 1982.⁷⁶

GLASS AND GLAZING WORK

These contractors (S.I.C. 1793) are engaged in glass and glazing work in connection with, but not limited to, building construction.

Their 1982 employment was 2,176, a 67.1% increase over their 1977 employment of 1,302.⁷⁷

Total construction receipts rose 182% from \$46,253,000 for 1977 to \$130,343,000 for 1982. Net receipts were \$128,497,000 for 1982. Value added increased 173% from \$23,453,000 for 1977 to \$64,115,000 for 1982.⁷⁸

EXCAVATING AND FOUNDATION WORK

These contractors (S.I.C. 1794) are engaged in excavation work, foundation work, and digging and loading, in connection with building, heavy, or engineering construction.

Their 1982 employment was 6,503, a 143% increase over their 1977 employment of 2,678.⁷⁹

Total construction receipts rose 286% from \$97,381,000 for 1977 to \$376,068,000 for 1982. Net receipts were \$336,314,000 for 1982. Value added increased 254% from \$69,392,000 for 1977 to \$245,741,000 for 1982.⁸⁰

WRECKING AND DEMOLITION WORK

These contractors (S.I.C. 1795) are engaged in the wrecking and demolition of buildings and other structures, with or without the sale of material derived from demolishing operations.

Their 1982 employment was 164, a 10.8% increase over their 1977 employment of 148.⁸¹

Total construction receipts rose 60.7% from \$3,977,000 for 1977 to \$6,393,000 for 1982. Net receipts were \$6,132,000 for

1982. Value added increased 43.3% from \$3,762,000 for 1977 to \$5,390,000 for 1982.⁸²

INSTALLATION OR ERECTION OF BUILDING EQUIPMENT

These contractors (S.I.C. 1796) are engaged in the installation of building equipment, not elsewhere classified, such as elevators, escalators, pneumatic tube systems, and dust collection equipment.

Their 1982 employment was 2,526, a 206% increase over their 1977 employment of 824.⁸³

Total construction receipts rose 280% from \$44,754,000 for 1977 to \$168,264,000 for 1982. Net receipts were \$165,387,000 for 1982. Value added increased 247% from \$32,480,000 for 1977 to \$112,578,000 for 1982.⁸⁴

SPECIAL TRADE CONTRACTORS, N.E.C.

These contractors (S.I.C. 1799) are engaged in construction work that could not be classified in another specific industry, including such construction work as core and diamond drilling, scaffolding construction, house moving, fireproofing and waterproofing of buildings and other structures, sandblasting and steam cleaning of building exteriors, and other construction activities.

Their 1982 employment was 9,315, a 22.9% increase over their 1977 employment of 7,579.⁸⁵

Total construction receipts rose 76.4% from \$259,366,000 for

1977 to \$457,482,000 for 1982. Net receipts were \$406,264,000 for 1982. Value added increased 76.0% from \$137,717,000 for 1977 to \$242,405,000 for 1982.⁸⁶

U.S. Census data for Florida in all categories presented above is summarized in Table 3-6.

XIII. PREFABRICATED WOOD PRODUCTS & MOBILE HOMES

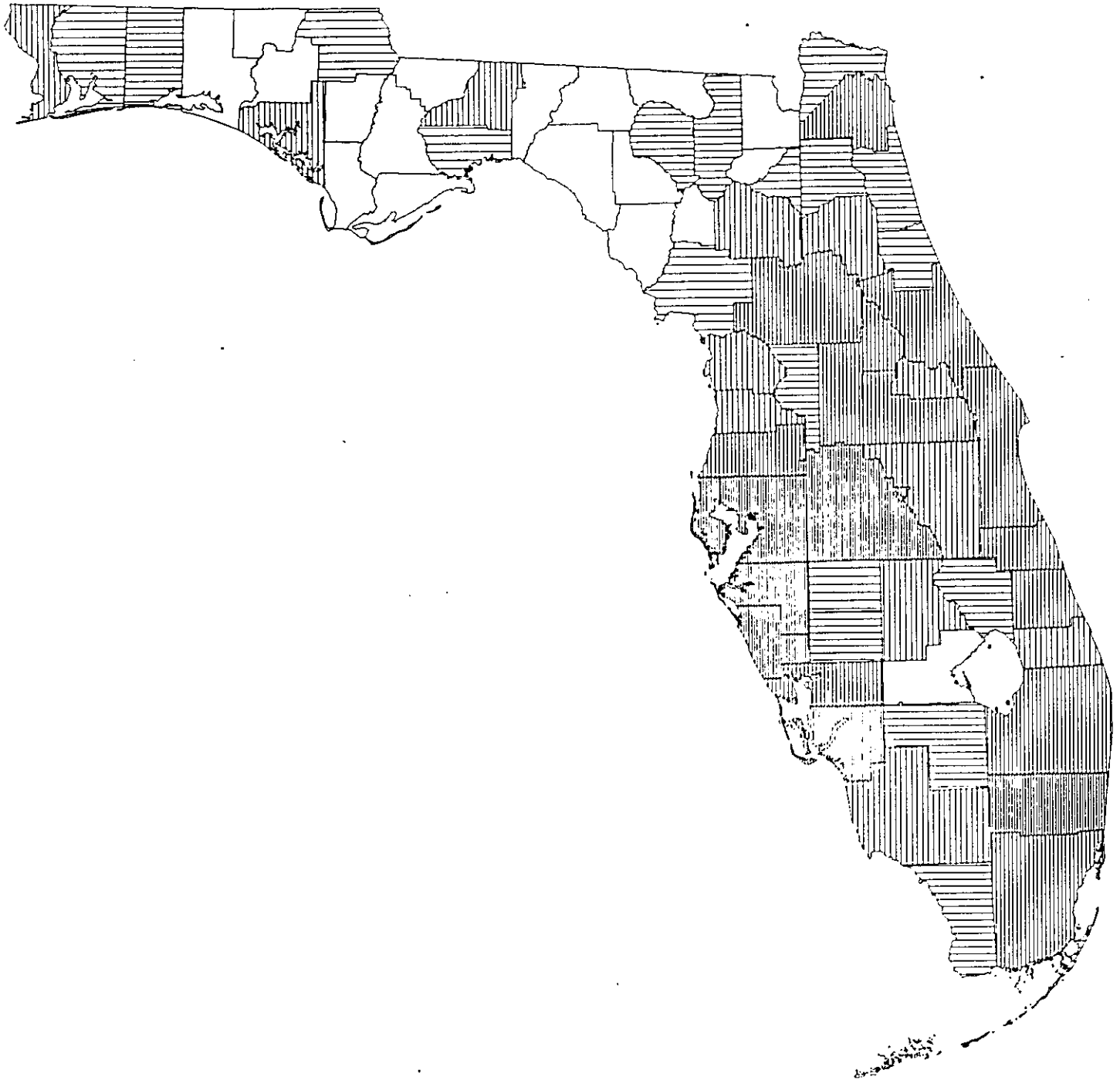
As home prices continue to increase more and more people turn to mobile homes as an alternative to on site constructed single family homes. The demand for mobile homes comes in the lower price range of housing as evident from the fact that "Mobile homes comprise 89% of all new single family homes sold for under \$40,000 in 1981" and only "...account for 36% of all new single family homes sold in 1981 (national average)".⁸⁷

For the years 1981-1983 more mobile homes were shipped to Florida than were produced here. In 1981 shipments were 26,347 and production was only 19,913. In 1982 shipments were 24,904 and production only 18,981. For 1983 shipments were 31,571 and production 24,824.⁸⁸ These figures also indicate the effect of the recession on the mobile home sector of the economy.

Map 3-7 shows the distribution of mobile home motor vehicle licenses sold for the fiscal year 1984-85. Pinellas county led with 62,670 licenses, followed by Hillsborough with 37,251, Polk with 33,913, Manatee with 25,228, Broward with 24,418, Sarasota with 24,301, and Lee county with 21,787.⁹⁰

MAP 3-7
MOBILE HOMES 89

82



HOMES



LESS THAN 500
2500 TO 7499



500 TO 999
7500 TO 19999



1000 TO 2499
20000 AND UP

TABLE 3-1 BUILDING PERMITS 1986
IN \$ MILLIONS ³

TYPE	\$\$	PERCENT
HOUSEKEEPING RESIDENTIAL	8330	57.70
NONHOUSEKEEPING RESIDENTIAL	348	2.40
NON RESIDENTIAL	3521	24.37
ADDITIONS AND ALTERATIONS	1742	12.06
PUBLIC	502	3.47

TABLE 3-2 CONSTRUCTION CONTRACTS
1984 IN \$MILLIONS ⁴

TYPE	\$\$	PERCENT
RESIDENTIAL	9929	58.82
NONRESIDENTIAL	5091	30.16
OTHER	1860	11.02

TABLE 3-3

HOUSING LOANS & START,
CALENDAR YEAR TOTAL; WITH
YEAR TO YEAR % CHANGE ²²

YEAR	SINGLE FAMILY				MULTI-FAMILY			
	LOANS		STARTS		LOANS		STARTS	
	(\$MIL)	%CHG	(EA.)	%CHG	(\$MIL)	%CHG	(EA.)	%CHG
1970			44818				70139	
1971			62707	39.91			86784	23.73
1972			78145	24.62			171191	97.26
1973	345		64300	-17.72	105		203172	19.01
1974	210	-39.33	42335	-34.16	49	-53.16	89457	-56.09
1975	189	-10.04	45204	-17.71	28	-42.46	31047	-65.29
1976	297	57.65	58989	69.32	30	7.18	35897	104.56
1977	505	70.09	77737	31.78	59	94.75	47291	31.74
1978	711	40.65	90422	16.32	69	16.47	60519	27.97
1979	791	11.31	94946	5.00	113	64.22	70170	15.95
1980	713	-9.94	87219	-8.14	125	10.48	75464	7.54
1981	520	-27.09	66195	-24.10	97	-22.05	71689	-5.00
1982	307	-40.88	56579	-14.50	71	-27.37	43699	-39.04
1983	NA	NA	101830	79.97	NA	NA	69961	60.09
1984	NA	NA	100746	-1.06	NA	NA	88502	26.50
1985	NA	NA	101626	0.08	NA	NA	89521	1.15
1986	NA	NA	106667	4.96	NA	NA	79953	-10.68

TABLE 3-4 HOUSING AFFORDABILITY INDEX ²⁶

YEAR	AVERAGE MORTGAGE INT. RATE	MORTGAGE QUALIFY INCOME	MEDIAN FAMILY INCOME	HOUSING AFFORD INDEX
1981	15.12	32485	22388	68.9
1982	15.38	33713	23433	69.5
1983	12.85	29546	24580	83.2
1984	12.49	29650	26433	89.1
1985	11.74	29243	27735	94.8
1986	10.25	27631	29200	105.7

TABLE 3-5 CONTRACTOR LICENSE DISTRIBUTION - BY COUNTY, May 1987

CNTY	CG	RG	CB	RB	CR	RR	CU	CM	CA
DADE	2835	510	328	311	191	202	14	104	388
DUVAL	649	726	339	402	346	182	33	43	97
HILLS	971	241	474	199	378	305	13	61	169
PINEL	954	204	509	381	363	531	24	26	82
POLK	297	223	95	220	69	546	10	25	37
P. BCH	2319	343	505	198	408	147	19	35	216
ORANG	834	263	377	134	332	444	15	36	79
VOLUS	379	189	250	73	351	217	10	7	69
ESCAM	93	1099	28	387	58	348	0	3	6
BROWA	2682	917	437	172	280	124	26	51	425
ALACH	234	357	132	128	118	81	1	1	26
LAKE	100	50	61	116	58	186	3	4	11
LEON	160	378	87	256	79	206	5	7	12
MARIO	122	462	87	162	86	207	3	4	22
MANAT	138	47	129	69	91	177	6	4	25
SARAS	441	137	281	182	199	398	1	9	57
SEMIN	405	91	225	90	223	232	8	17	40
LEE	669	206	297	110	294	166	16	20	104
BREVA	446	294	194	122	200	235	6	10	35
ST. JO	58	120	29	153	39	79	2	1	3
GADSD	12	25	6	50	4	31	0	1	0
PUTNA	27	29	14	43	9	72	0	0	1
BAY	57	241	18	306	5	259	1	1	2
ST. LU	176	36	93	56	92	130	0	2	26
JACKS	6	49	3	65	1	65	0	0	0
OSCEO	70	37	44	53	26	70	3	3	5
HIGHL	55	51	45	42	32	132	1	0	9
PASCO	138	70	148	156	144	203	4	4	25
COLUM	15	76	14	61	12	33	1	1	2
HARDE	8	19	3	30	4	10	0	1	0
SUWAN	8	12	9	28	3	36	1	0	2
I. RIV	172	65	69	40	81	67	0	1	14
SAN. R	19	785	4	114	15	107	0	1	0
DESOT	11	8	13	13	2	16	0	0	0
MADIS	4	16	0	12	1	18	0	0	0
WALTO	3	148	0	31	1	27	0	0	0
TAYLO	3	8	0	37	0	5	0	0	0
MONRO	145	83	61	37	31	62	0	2	13
LEVY	15	37	5	43	7	20	0	0	3
HERNA	43	32	61	53	53	120	0	4	10
NASSA	29	37	16	28	28	49	2	0	1
MARTI	295	73	103	38	110	50	4	3	30
OKALU	30	936	16	206	27	113	0	2	2
SUMTE	6	12	15	33	11	36	0	0	1
BRADF	4	25	4	37	6	16	0	1	2
JEFFE	3	13	3	8	1	19	0	0	0
CITRU	47	56	38	69	34	141	1	0	5

TABLE 3-5 (county list continued)

CNTY	CG	RG	CB	RB	CR	RR	CU	CM	CA
----	----	----	----	----	----	----	----	----	----
CLAY	89	83	72	59	80	49	4	2	15
HENDR	14	14	8	5	4	11	0	0	2
WASHI	3	70	0	24	0	22	0	0	0
HOLME	0	24	0	20	0	33	0	0	0
BAKER	4	15	3	11	2	7	2	0	1
CHARL	111	22	68	50	64	130	1	1	8
DIXIE	2	7	0	16	0	26	0	0	0
GILCH	0	6	3	12	2	15	0	1	0
HAMIL	0	3	1	20	2	4	0	0	0
OKEECH	16	18	19	23	10	25	0	0	6
CALHO	3	19	2	25	3	15	0	0	0
FRANK	1	76	1	21	2	9	0	0	0
GLADE	1	3	0	1	2	0	0	0	0
FLAGL	15	97	10	19	19	22	0	0	2
LAFAY	2	1	0	9	0	6	0	0	0
UNION	1	16	2	12	0	4	0	0	0
COLLI	276	103	109	76	97	109	5	1	13
WAKUL	5	19	2	15	3	12	0	0	0
GULF	0	72	0	32	0	8	0	0	0
LIBER	3	4	0	9	0	5	0	0	0
	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL	16733	10508	5969	6013	5193	7432	245	500	2103

TABLE 3-5 CONTRACTOR LICENSE DISTRIBUTION - BY COUNTY, May 1987
continued.

CNTY	CM	CA	CF	CS	RA	RF	RM	RS	ER	EC	CC	RC
DADE	104	388	216	13	204	249	166	47	638	119	107	297
DUVAL	43	97	87	4	287	114	150	50	358	69	41	425
HILLS	61	169	155	10	161	116	153	34	491	42	94	240
PINEL	26	82	75	5	131	235	137	33	409	35	83	286
POLK	25	37	37	6	110	144	23	26	392	15	25	218
P.BCH	35	216	128	7	172	181	31	29	466	38	74	139
ORANG	36	79	52	2	290	181	92	21	396	31	73	240
VOLUS	7	69	57	2	95	115	79	18	234	13	26	131
ESCAM	3	6	11	0	254	116	86	14	162	10	4	111
BROWA	51	425	210	15	226	310	118	34	720	80	175	324
ALACH	1	26	7	3	89	64	47	22	167	8	2	176
LAKE	4	11	8	0	73	71	19	8	148	4	6	78
LEON	7	12	15	2	275	63	72	32	136	12	10	114
MARIO	4	22	1	0	145	121	142	12	218	9	11	119
MANAT	4	25	13	0	71	85	28	5	115	3	10	65
SARAS	9	57	35	1	100	128	18	14	187	5	36	122
SEMIN	17	40	24	0	62	78	29	9	128	10	24	100
LEE	20	104	73	4	107	121	28	8	243	16	107	74
BREVA	10	35	19	0	193	122	32	15	254	10	38	164
ST.JO	1	3	5	0	45	38	21	11	157	1	6	46
GADSD	1	0	0	0	22	18	15	4	65	1	0	11
PUTNA	0	1	6	0	144	46	8	2	103	1	4	19
BAY	1	2	6	0	118	119	71	16	258	5	2	126
ST.LU	2	26	18	0	43	39	9	7	102	0	8	24
JACKS	0	0	1	0	20	46	30	2	161	0	0	31
OSCEO	3	5	6	0	25	31	7	1	73	1	2	24
HIGHL	0	9	6	1	16	56	21	4	110	0	3	27
PASCO	4	25	23	1	88	131	31	8	246	10	16	72
COLUM	1	2	2	0	36	27	8	2	87	2	2	49
HARDE	1	0	1	0	7	11	11	1	39	0	0	17
SUWAN	0	2	1	0	11	22	11	1	76	4	1	5
I.RIV	1	14	14	0	69	58	18	6	258	5	5	40
SAN.R	1	0	1	0	53	76	36	1	82	2	1	54
DESOT	0	0	0	0	4	13	8	1	34	0	3	15
MADIS	0	0	0	0	4	10	4	1	28	0	0	1
WALTO	0	0	0	0	8	24	34	1	92	0	0	12
TAYLO	0	0	0	0	19	9	2	2	24	1	0	7
MONRO	2	13	6	2	24	43	25	4	88	1	1	21
LEVY	0	3	1	0	22	27	32	3	121	0	1	10
HERNA	4	10	5	0	30	28	15	5	100	1	3	32
NASSA	0	1	1	0	25	26	4	0	97	1	1	14
MARTI	3	30	18	0	29	28	6	6	74	3	12	27
OKALU	2	2	3	0	39	130	160	12	224	8	0	62
SUMTE	0	1	1	0	17	36	6	3	103	0	1	15
BRADF	1	2	2	0	16	11	7	1	79	1	0	14
JEFFE	0	0	0	0	3	5	5	2	16	0	0	7
CITRU	0	5	1	2	36	52	25	12	122	2	4	13

TABLE 3-5 CONTRACTOR LICENSE DISTRIBUTION - BY COUNTY, May 1987
county list continued.

CNTY	CM	CA	CF	CS	RA	RF	RM	RS	ER	EC	CC	RC
CLAY	2	15	17	0	52	19	9	5	103	10	3	27
HENDR	0	2	0	0	6	11	16	1	39	2	1	15
WASHI	0	0	0	0	7	16	2	0	49	0	1	10
HOLME	0	0	0	0	1	12	9	0	37	0	0	3
BAKER	0	1	1	0	6	8	5	0	33	1	0	3
CHARL	1	8	11	0	26	23	2	1	50	3	15	43
DIXIE	0	0	1	0	3	3	6	0	19	0	0	4
GILCH	1	0	0	0	12	12	4	0	29	0	0	4
HAMIL	0	0	0	0	3	9	3	0	15	0	0	4
OKEECH	0	6	1	0	9	13	4	2	29	2	3	10
CALHO	0	0	0	0	3	9	8	0	36	0	0	16
FRANK	0	0	0	0	11	7	0	1	26	0	0	12
GLADE	0	0	0	0	0	1	0	0	6	0	0	4
FLAGL	0	2	2	0	14	19	2	0	46	1	1	10
LAFAY	0	0	0	0	1	0	1	0	4	0	0	0
UNION	0	0	0	0	5	5	0	0	26	0	0	0
COLLI	1	13	18	0	43	96	29	4	153	7	7	60
WAKUL	0	0	0	0	10	8	0	1	18	0	0	7
GULF	0	0	0	0	10	24	9	0	63	0	0	9
LIBER	0	0	0	0	1	1	2	0	9	0	0	2
TOTAL	500	2103	1402	80	4241	4070	2191	565	9671	605	1053	4461

TABLE 3-6 SUMMARY OF 1982 CENSUS DATA

SEGMENT	EMPLOYMENT	\$\$ 000s \$\$		
		TOTAL RECEIPTS	VALUE ADDED	NET RECEIPTS
GEN. CONT./SF	21766	1,739,372	690,951	1,240,821
OPERATIVE BLDR.	14106	2,004,320	736,875	1,082,843
RESIDENT./OSF	7800	1,041,509	262,230	458,364
N.RES/O IND.WH	20683	2,501,439	600,529	1,093,518
IND. & W/HOUSE	5036	505,501	125,992	248,643
B,T,EVEV.HWAY	1728	130,498	71,987	110,500
W,S,PIPE/L,C,PL	10694	619,184	321,207	515,465
HEAVY CONS/CONT	8549	652,163	385,794	553,456
HWAY & STREET	11806	874,425	407,518	687,197
P,H,AIR/COND	33580	1,867,327	918,290	1,693,157
ELECTRICAL	25689	1,267,293	699,835	1,241,265
ROOFING & SM	14931	653,002	348,239	624,705
MAS./S.SETTING	7272	206,000	121,085	194,363
P,D/WALL,ACC/IN	15247	619,427	344,908	570,377
TER.,TILE,M&W	2465	101,768	53,358	98,273
CONCRETE WORK	10565	497,610	271,726	437,825
P,P/HANG./DEC.	8860	247,492	161,616	222,964
CARPENTERING	8000	253,616	141,731	227,062
F/LAY, OF/WORK	1295	51,453	24,449	47,718
WATER WELL DR.	1055	57,853	31,200	56,143
STR. STEEL ER.	3581	167,130	108,045	154,467
GLASS/GLAZING	2176	130,343	64,115	128,497
EXC. & FOUND.W	6503	376,068	245,741	336,314
WRECK & DEMO	164	6,393	5,390	6,132
INST/EREC. B&E	2526	168,264	112,578	165,387
SP/TR/CONT/NEC	9315	457,482	242,405	406,264

SPECIFIC SOURCES ARE LISTED IN THE TEXT

Notes to Chapter 3

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30. National Association of Home Builders, Housing News Service, 1987.
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33. BEBR, Computerized Data Base, File S7NS.
34. Ibid., File MSNS.
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39. Ibid.
40. Construction Industry Licensing Board, File of Contractors.
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CHAPTER 4

SHOWING ECONOMIC IMPACT THROUGH INPUT-OUTPUT ANALYSIS

I. ECONOMIC IMPACTS

Before the input-output model can be understood, it is important to realize how one industry or sector can stimulate total economic activity throughout other sectors. These impacts can be divided into four categories: direct, indirect, induced, and total impacts.

First, direct impacts are those associated with the actual production of a product. Within the construction industry, direct impacts would include wages and jobs to management and labor. As a result of the direct impacts, additional economic activity is created throughout the other sectors in the way of goods and services provided by local businesses or individuals to the basic industry. Basic in this sense represents the industry actually providing the final product. This indirect impact is represented within the construction industry by subcontractors, material suppliers, consultants and business services. An increase in indirect impact will result in additional jobs and income for state residents.

Both direct and indirect impacts can cause additional activity within the economy called induced impacts. This type of activity is associated with the spending of the individuals employed by the direct and indirect businesses. This personal spending results in increased sales by retail organizations, savings and checking accounts, and all other services purchased

by the consumer.

The total impact of an industry on the economy can be represented by the summation of direct, indirect, and induced impacts. This impact may be represented by a series of events stemming from the basic industry and continuing throughout the economy.

A spending chain reaction results from an increase in output of a given industry. This increase in output results in additional local output and purchases as suppliers expand to meet the needs of the first industry. Consumer spending also increases as output of both the service and supply industries expand.

Capital within the chain reaction is not completely retained. Some money leaves the state economy as payments for imports, federal taxes, savings, and dividends paid outside the region.

A measurement of this economic spending, the "multiplier effect", represents the total re-spending which results from a one dollar increase in output of a service or basic industry. This would indicate that an industry with a high multiplier has more impact on the economy as a whole.

The multiplier effect can be used to analyze a decrease in basic industry output. This type of change would stimulate a decrease in spending and economic activity associated with the basic industry. The multiplier can be used as a tool to determine economic ties and dependencies among sectors and between sectors and the economy as a whole.

II. INPUT-OUTPUT MODELING

Input-output analysis is a technique used to show the economic interrelationships between industries.¹ This method provides a straight forward description of an economic function in a particular year showing the flow of goods and services among all the sectors as well as those outside the designated area. This means that for each sector or industry, the sum of all outputs sold to other sectors must equal the sum of all inputs. To show the relationship among sectors, a matrix is used with producers of outputs down the left hand side and purchasers of inputs across the top. A simplified illustration of an input-output model is shown in Figure 4-1.

	Purchasing Industries Within the economy	Final Demand
Producing or Selling I N D U S T R I E S		
Charges Against Final Demand		

Fig. 4-1

Input-output analysis involves three phases - transactions, coefficients, and total requirements. A matrix table is constructed for each. These matrices form the basis for the multiplier or impact analysis.

TRANSACTION TABLE

The first phase of input-output analysis, the transaction table, shows the flow of goods and services as a dollar value within an economy over a period of one year. Transactions are expressed in terms of producer prices.²

With the transaction matrix, a dollar figure is placed in each cell to represent the total output sold during the year by the industry on the left to the industry at the top. Households are treated as a separate industry selling labor and purchasing goods and services.³ For example, in Figure 4-2, the horizontal row of industry A sold \$2 million to itself (e.g., a building supply company will buy building supplies for its own repair construction), \$7 million to industry B, \$16 million to industry C, \$12 million to the household industry, and \$11 million to final demand for a grand total output in sales of \$48 million.

Since, within the transaction matrix, sales by one industry equal the purchases by other industries, each column in a transaction table shows the total inputs purchased by each industry listed at the top from all the sellers named at the left. The value added row below the transaction matrix

	A	B	C	HH	FINAL DEMAND	TOTAL SALES
A	2	7	16	12	11	48
B	5	14	12	9	4	44
C	4	11	8	3	15	41
HH	17	6	3	9	20	55
VALUE ADDED	20	6	2	22		
TOTAL PURCHASES	48	44	41	55		

Fig. 4-2

represents the dollar value of profit, interest, depreciation, and taxes contributed by the industries at the top of the table. Using industry A again, the first column shows that in order for industry A to meet its production needs, it must purchase \$2 million from itself, \$5 million from industry B, \$4 million from industry C, \$17 million from households (labor), and \$20 million in profit, interest, depreciation and taxes. The total transactions of the economy for a one year period are represented by the rows and columns of the transaction matrix.

TECHNICAL COEFFICIENTS

The second phase of the input-output analysis is the calculation of technical coefficients for each cell for the transaction table. This is accomplished by dividing the inputs of each industry by the total output for that industry. For example, in Figure 4-3, the technical coefficients for industry A would be 0.04, 0.10, 0.08, 0.35. They were determined by

dividing each of the values in Column A of Figure 4-2 (2, 5, 4, and 17) by the total output in Row A of 48.

	A	B	C	HH
A	.04	.16	.39	.22
B	.10	.32	.29	.16
C	.08	.25	.20	.05
HH	.35	.14	.07	.16

Fig. 4-3

Each technical coefficient signifies the amount of input required from the industry named at the left for each dollar of output produced by the industry at the top of the technical coefficients table. For example, each dollar of output by industry A requires 4 cents of purchases from itself, 10 cents from B, 8 cents from C, and 35 cents from households. The complete table of technical coefficients reflects the technical composition of production in the economy in terms of inputs required in the production and trade processes. These technical coefficients can be used to calculate the amount of direct purchase requirements as a result of an increase or decrease in the output of one or more of the purchasing industries.

TOTAL REQUIREMENTS

The third and final phase in this analysis involves constructing a table of total requirements. From this table, we are able to obtain multipliers for computing the total impact of

any sector in this economy. The table of technical coefficients provides the starting point for the total requirements table. Each column in the technical coefficients table is a linear equation which is the production function for the industry in that particular column. That is, it shows the input requirements for expanding the output by one unit. Therefore, mathematically all of the equations can be solved to obtain the output level necessary for each row industry or seller to meet its final demand sales plus its intermediate sales to other industries.

LIMITING ASSUMPTIONS OF I-O ANALYSIS

Input-output models provide a wealth of information concerning transactions and interdependencies between the industries within the economy. The models show that every industry is dependent upon all other industries. There are, however, some limitations to the model that must be considered. A brief review of input-output analysis will detail some of the major limiting assumptions.

The first basic assumption deals with the input-output production function in that it has constant technical coefficients to express the requirements per dollar of output from one industry to another. This refers to constant returns to scale, which means that a proportional change in all inputs lead to the same proportional change in outputs. If the inputs were all doubled, then the outputs would also be doubled. Therefore, this rules out economics and diseconomies of scale coming from a

large percentage change in size and output. The longer the time period between measurements, the less valid the coefficients become.⁴

The second basic assumption is that the inputs are combined in fixed proportions and substitutions of one input for another is not allowed. Proportions are given by the direct technical coefficients which are assumed to remain constant despite changes in relative prices and output levels. These fixed input ratios freeze the state of technology for the period of analysis.

Relative to the technical coefficients is the measurement of outputs in terms of dollars. Technical coefficients are not in dollar units or constant dollars. This means that if prices for inputs change disproportionately, then the coefficients would have to be recalculated.⁵

Another assumption is that a commodity is considered to be supplied by only one industry and is the only product of that industry. This does not correspond to reality in that many industries have been aggregated for manageability and, therefore, their products are not necessarily alike. Aggregated industries have similar input structures which assumes a clear delineation of industries and their transactions.

The last, and fourth major assumption is the inability of the input-output analysis to account for changes in supply factors. Since input-output is a demand driven model (inputs required for outputs), it assumes that the supply of inputs such as labor, capital, land, and imports are readily available at the

same cost and proposes no constraints on the economy.⁶

III. MULTIPLIERS

One of the most important qualities of an input-output model is its ability to generate multipliers. Multipliers are attained through the development of the interdependence coefficients in the total requirements table. It is from this that the output, employment, and income multipliers can be derived.

Multipliers are generally used to trace the effects of changes in final demand through the economy. They measure the direct, indirect, and induced effects of particular economic changes. Multipliers can be used to measure the ripple effect of a change in final demand of a particular industry on the whole economy or on the individual industries which are related to it.⁷

The sectoral multipliers differ substantially from one industry to the next depending on the degree of interdependence with the other industries. Industries with large output multipliers have a larger percentage of the required inputs coming from within the local economy.

Output, income, and employment multipliers measure repercussions in the local economy due to changes in output. Because they differ in concept, each multiplier will be discussed separately.

OUTPUT MULTIPLIERS

The output multipliers for an industry measure the sum of the direct and indirect requirements from all industries due to a dollar change in the given industry's final demand. The total requirements table shows the required output from each industry when final demand changes by one dollar in a given row. The sum of the coefficients in that industry's column equals the industry's output multiplier. A dollar increase in an industry's final demand (output multiplier of 4.66) generates \$3.66 worth of additional economic activity. The \$4.66 includes \$1.00 of new final demand with the \$3.66 of additional economic activity.⁸

EARNINGS MULTIPLIERS

Input-output models allow the calculation of two types of earnings multipliers. In the first type, earnings multipliers can be calculated with the household industry excluded from the transaction matrix (type I multipliers). The second type of earnings multipliers includes the household industry as a part of the transaction matrix (Type II multipliers).⁹ The type II earnings multipliers, which will be used in this case, are calculated from the input-output table which includes households as a separate industry in the transaction matrix. Households are like any other industry, purchasing inputs (consumption) and selling outputs (labor) to all of the other industries. This allows the model to capture economic impacts (induced impacts) associated with the spending activity of consumers.

Calculating earnings multipliers is done by dividing each element in the household row of the total requirements table by the corresponding element in the household row of the technical coefficients matrix. This allows the industry's income multiplier to be calculated by dividing the direct, indirect, and induced changes in income per dollar change in sector output by only the direct effects on income due to a dollar change in output.

Earnings multipliers actually reflect the impact of change in income and should be interpreted with caution when dealing with their changes in output.¹⁰ For example, if there is a high direct payment with only a small increase to include indirect and induced payments, then the income multiplier is low. On the other hand, if there is an industry whose direct, indirect, and induced payments are much larger than the direct payment, then the earnings multiplier will be high. This high earnings multiplier indicates that there are strong structural ties with other local industries.

EMPLOYMENT MULTIPLIERS

The employment multiplier for an industry estimates the effects on employment of a change in final demand for that industry's output.¹¹ Similar to the income multipliers, there are direct, indirect, and induced employment changes when the final demand for an industry's output changes. Direct employment changes result as an industry makes production adjustments to

meet the needs of final demand. Indirect employment changes occur when each industry makes output adjustments to support the change in deliveries to final demand. Induced employment changes occur when the economy responds to the change in local household spending.

Calculating employment multipliers can be accomplished with the input-output table using an industry's employment and dividing it by the total gross output of that industry.¹² The result of this calculation is a direct employment ratio which indicates the employment directly required per dollar change in final demand.

The total effect on employment of a change in final demand is the sum of the direct, indirect, and induced employment effects. In order for the total effect to be estimated, each row in the table of technical coefficients is multiplied by the direct employment ratio for each corresponding industry. The sum of the values in each column equal the industry's employment multiplier. For example, an employment multiplier of 0.00028 indicates that when final demand increases by \$100,000.00, that industry will generate employment for twenty-eight people within the state economy.

Notes to Chapter 4

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4. Loehman and Mcelroy, Regional Development Planning, 28.
5. Ibid., 29.
6. Ibid.
7. Miernyk, Input-output Analysis, 42-43.
8. Richardson, Regional Economics, 32.
9. Ibid., 42.
10. Loehman and Mcelroy, Regional Development Planning.
11. Miernyk, Input-Output Analysis, 53.
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CHAPTER 5.
INPUT-OUTPUT MODEL
ECONOMIC IMPACT OF THE CONSTRUCTION INDUSTRY

I. MULTIPLIERS IN GENERAL

The input-output multipliers presented in this report were generated by the U.S. Department of Commerce RIMS II system. Under the RIMS II system, the construction industry is broadly broken down into new construction, maintenance and repair construction. Mobile homes is a subsector of the manufacturing industry. New construction is further broken down into 36 detailed subsectors. Maintenance and repair construction is broken down into 17 detailed subsectors. The economy of Florida as a whole is broken down into 39 industry sectors including new construction and maintenance and repair construction as individual sectors.

Appendix A lists each of the new construction and maintenance and repair construction detailed subsectors. Appendices B through D show the detailed construction multipliers across all 39 sectors of the Florida economy for output, earnings and employment. The results of the RIMS II model showing output, earnings and employment relationships between the construction industry and other sectors of the Florida economy are discussed in the following sections.

The multipliers reported in the previous edition of this

report were based on a study by the Institute of Food and Agricultural Science of the University of Florida. Some of the multipliers reported under the RIMS II model are significantly different than those multipliers appearing in the previous version of this report. The original University of Florida study was an update of 1972 data to 1983 based on employment. The RIMS II model is an update of 1977 data to the present based on earnings and modified procedures used by the U.S. Department of Commerce.

II. TOTAL IMPACTS

OUTPUT MULTIPLIERS

The output multiplier for new construction and maintenance and repair construction show the total expansionary effect on the economy by increasing final demand. These multipliers are found in rows 5 and 6 of Figure 5-1. The construction output multiplier of 2.1110, indicates that a dollar increase in final demand for construction, would increase the value of total state output by \$2.11, of which an additional \$1.11 is economic activity generated in other sectors of the state economy. Other sectors with large output multipliers include: Insurance, Health Services, and Misc. Services.

EARNINGS MULTIPLIERS

The earnings multiplier for construction, which is .7084 in

Figure 5-1, excludes the mobile home industry. This multiplier

FIGURE 5-1 TOTAL MULTIPLIERS, BY INDUSTRY AGGREGATION,
OUTPUT, EARNINGS AND EMPLOYMENT

	OUTPUT (\$\$)	EARNINGS (\$\$)	EMPLOYMENT (JOBS)
	-----	-----	-----
1. AGRICULTURE	1.9249	0.6476	49.40
2. FOREST & FISH	1.8071	0.6260	47.00
3. COAL MINING	1.5943	0.4902	85.90
4. PETRO/NAT.GAS	1.4600	0.2302	11.00
5. MISC.MINING	1.6816	0.4305	22.80
6. NEW CONST	2.1110	0.7084	43.30
7. MAINT/REP CONST.	2.0370	0.7887	47.70
8. FOOD/ KIND PROD.	1.8699	0.4046	24.60
9. TEX MILL PRODS	1.7064	0.4154	29.00
10. APPAREL	1.6645	0.4896	40.30
11. PAPER PROD.	1.8333	0.4380	21.90
12. PRINT/PUB	1.9156	0.6253	37.80
13. CHEM/PETR REFNG	1.7437	0.3496	17.90
14. RUB/LEATH PROD.	1.6490	0.4639	30.00
15. LUMB,WOOD/FURN.	1.8080	0.4905	31.90
16. STONE/CLAY/GLS.	1.8938	0.5375	29.20
17. METAL INDUS.	1.5655	0.3761	19.00
18. FAB. METAL	1.6118	0.4389	23.90
19. MACH.,NON-ELEC.	1.8508	0.5677	28.20
20. ELEC./EQUIP.	1.9442	0.6687	34.80
21. MOTOR VEHICLES	1.4801	0.3302	15.60
22. TRANSP.EQ.	1.8493	0.6082	28.40
23. INSTRUMENTS	1.7844	0.5756	32.90
24. MISC. MFG.	1.7675	0.5098	36.20
25. TRANSPORTATION	1.9520	0.7250	37.90
26. COMMUNICATION	1.5782	0.4516	20.90
27. ELEC/GAS/WATER	1.3891	0.2409	11.40
28. WHSALE. TRADE	1.8731	0.6747	37.80
29. RETAIL TRADE	1.9259	0.7807	57.60
30. FINANCE	1.9185	0.5985	33.40
31. INSURANCE	2.2217	0.8135	44.10
32. REAL ESTATE	1.3983	0.1614	12.60
33. HOT/LODG/AMUS	1.9264	0.6219	53.90
34. PERSONAL SVCS	1.8642	0.7361	75.70
35. BUSINESS SVCS	1.9414	0.8302	58.40
36. EAT/DRINK	2.0214	0.6066	64.00
37. HEALTH SVCS	2.0500	0.9222	48.40
38. MISC. SVCS	2.0311	0.6418	38.10
39. HOUSEHOLDS	1.0894	0.3452	24.10

indicates that a \$1.00 increase in output in new construction will generate \$.7084 in local income. For maintenance and repair construction the multiplier is .7887 meaning that a \$1.00 increase in output generates \$.79 in local earnings. This shows that construction has strong structural ties (a high degree of interaction) with the other local sectors in Florida. There are only six of the 39 sectors with structural ties as strong as construction.

EMPLOYMENT MULTIPLIERS

The employment multipliers for new and maintenance and repair construction are 43.3 and 47.7 respectively. The interpretation of the employment multipliers are that they are most useful for comparison purposes. The higher the multiplier, the greater the degree of interaction the subject industry has with the other industry sectors in Florida. From Figure 5-1 only nine other sectors are found to match the interaction of the construction sectors.

III. IMPACTS ACROSS INDUSTRIES

Figure 5-2 shows the output multipliers applicable to specific industry sectors for increases in output in new construction, maintenance and repair construction, and mobile home manufacturing. Because of the diverse nature of the different types of new construction and maintenance and repair

FIGURE 5-2

TOTAL OUTPUT MULTIPLIERS BY INDUSTRY
FOR NEW CONSTRUCTION, MAINTENANCE AND
REPAIR CONSTRUCTION, AND MOBILE HOMES

	NEW CONST.	MAINT& REPAIR CONST.	MOBILE HOMES
1. AGRICULTURE	0.0126	0.0183	0.0074
2. FOREST & FISH	0.0018	0.0013	0.0014
3. COAL MINING	0.0000	0.0000	0.0000
4. PETRO/NAT.GAS	0.0001	0.0002	0.0001
5. MISC.MINING	0.0087	0.0144	0.0009
6. NEW CONST	1.0000	0.0000	0.0000
7. MAINT/REP CONST.	0.0249	1.0251	0.0170
8. FOOD/ KIND PROD.	0.0352	0.0389	0.0222
9. TEX MILL PRODS	0.0005	0.0005	0.0013
10. APPAREL	0.0092	0.0103	0.0078
11. PAPER PROD.	0.0084	0.0086	0.0072
12. PRINT/PUB	0.0120	0.0120	0.0086
13. CHEM/PETR REFNG	0.0223	0.0339	0.0148
14. RUB/LEATH PROD.	0.0073	0.0113	0.0089
15. LUMB,WOOD/FURN.	0.0562	0.0218	0.0780
16. STONE/CLAY/GLS.	0.0568	0.0375	0.0249
17. METAL INDUS.	0.0071	0.0055	0.0105
18. FAB. METAL	0.0644	0.0583	0.0835
19. MACH.,NON-ELEC.	0.0096	0.0084	0.0047
20. ELEC./EQUIP.	0.0133	0.0122	0.0100
21. MOTOR VEHICLES	0.0009	0.0010	0.0026
22. TRANSP.EQ.	0.0035	0.0035	1.0037
23. INSTRUMENTS	0.0019	0.0021	0.0014
24. MISC. MFG.	0.0036	0.0038	0.0026
25. TRANSPORTATION	0.0504	0.0480	0.0351
26. COMMUNICATION	0.0262	0.0273	0.0182
27. ELEC/GAS/WATER	0.0284	0.0301	0.0181
28. WHSALE. TRADE	0.0845	0.0807	0.1017
29. RETAIL TRADE	0.1203	0.1303	0.0489
30. FINANCE	0.0224	0.0239	0.0155
31. INSURANCE	0.0260	0.0239	0.0135
32. REAL ESTATE	0.1135	0.1226	0.0694
33. HOT/LODG/AMUS	0.0142	0.0145	0.0095
34. PERSONAL SVCS	0.0137	0.0149	0.0094
35. BUSINESS SVCS	0.1111	0.0490	0.0366
36. EAT/DRINK	0.0399	0.0423	0.0293
37. HEALTH SVCS	0.0387	0.0431	0.0233
38. MISC. SVCS	0.0447	0.0445	0.0249
39. HOUSEHOLDS	0.7050	0.7854	0.4249
TOTAL	2.0948	2.0238	1.7728

construction, readers may be more interested in the multipliers for specific subsectors of these industry sectors. The multipliers for output, earnings, and employment by subsector across the 39 industry sectors are found in Appendices B, C, and D. For general comparison purposes the information in Figure 5-2 may be useful. For instance, new construction has more relative impact on business services than either maintenance and repair construction or mobile home manufacturing. The three classifications have relatively the same impact on transportation equipment.

IV. CONSTRUCTION SUBSECTOR IMPACTS ACROSS INDUSTRIES

This section contains three hypothetical case studies that illustrate how users of the RIMS II data can estimate the Florida economic impacts of project and program expenditures, using multipliers from Appendices B, C, & D.

CASE 1: INCREASED MAINTENANCE AND REPAIR OF HIGHWAYS AND STREETS

An often used reason for the need for increased state revenues is the decaying infrastructure of the state. Although there are many definitions for infrastructure, highways and streets should be part of all of them. Expenditures for the maintenance and repair of our existing highways and streets will affect the industries in the economy differently than other subsectors would. To determine how each industry's output would

Figure 5-3 OUTPUT IMPACT OF \$100 MILLION PROGRAM
MAINTENANCE & REPAIR OF HIGHWAYS & STREETS

INDUSTRY	OUTPUT MULTIPLIER	DOLLAR
	<u>12.0214</u>	<u>IMPACT</u>
1 AGRICULTURE	0.0137	1,370,000
2 FOREST & FISH	0.0008	80,000
3 COAL MINING	0	0
4 PETRO/NAT.GAS	0.0002	20,000
5 MISC.MINING	0.0626	6,260,000
6 NEW CONST	0	0
7 MAINT/REP CONST	1.0239	102,390,000
8 FOOD/ KIND PROD	0.0446	4,460,000
9 TEX MILL PRODS	0.0006	60,000
10 APPAREL	0.0116	1,160,000
11 PAPER PROD.	0.0083	830,000
12 PRINT/PUB	0.0127	1,270,000
13 CHEM/PETR REFG	0.0507	5,070,000
14 RUB/LEATH PROD.	0.0091	910,000
15 LUMB,WOOD/FURN.	0.0113	1,130,000
16 STONE/CLAY/GLS.	0.0442	4,420,000
17 METAL INDUS.	0.0038	380,000
18 FAB. METAL	0.0453	4,530,000
19 MACH.,NON-ELEC.	0.0029	290,000
20 ELEC./EQUIP.	0.0092	920,000
21 MOTOR VEHICLES	0.0012	120,000
22 TRANSP.EQ.	0.0036	360,000
23 INSTRUMENTS	0.0017	170,000
24 MISC. MFG.	0.0059	590,000
25 TRANSPORTATION	0.0726	7,260,000
26 COMMUNICATION	0.0281	2,810,000
27 ELEC/GAS/WATER	0.0311	3,110,000
28 WHSALE. TRADE	0.0677	6,770,000
29 RETAIL TRADE	0.1058	10,580,000
30 FINANCE	0.0242	2,420,000
31 INSURANCE	0.0277	2,770,000
32 REAL ESTATE	0.1387	13,870,000
33 HOT/LODG/AMUS	0.0161	1,610,000
34 PERSONAL SVCS	0.0171	1,710,000
35 BUSINESS SVCS	0.0592	5,920,000
36 EAT/DRINK	0.0479	4,790,000
37 HEALTH SVCS	0.0499	4,990,000
38 MISC. SVCS	0.0519	5,190,000
39 HOUSEHOLDS	0.9092	90,920,000
TOTAL	2.1059	210,590,000

be affected by a \$100 million highway maintenance and repair program we can use the RIMS II tables found in the Appendices.

In Appendix A, 'Maintenance and repair of highways and streets' is classification 12.0214. This number identifies the column of output multipliers applicable to the 39 industries found in Appendix B. For this example only Output will be considered. Earnings and Employment results can be calculated in a similar manner.

Figure 5-3 shows the derivation of estimates of the impacts of a \$100 million highway maintenance program using the multipliers from Appendix B. The first column reproduces the column under subsector 12.0214 in Appendix B. Each entry in column one is the dollar change in output that occurs in each row industry for each additional dollar of output delivered to final demand by this maintenance and repair construction. To obtain the dollar impact on the output of each row industry of an additional \$100 million output delivered to final demand by this maintenance and repair construction program, each entry in column one is multiplied by \$100 million. Column two shows the resulting impacts. The column two total (Households excluded), \$210,590,000, is the dollar impact on the output of all industries excluding households but including maintenance and repair construction itself.

CASE 2: NEW CONSTRUCTION OR EXPANSION OF MILITARY FACILITIES

Military installations are often large projects impacting their host communities in many ways. Although output impacts could be calculated, in this case we will examine the estimated

Figure 5-4 EARNINGS IMPACT OF \$30 MILLION
MILITARY BASE EXPANSION PROJECT

INDUSTRY	EARNINGS MULTIPLIER	DOLLAR
	<u>11.0701</u>	<u>IMPACT</u>
1 AGRICULTURE	0.0049	147,000
2 FOREST & FISH	0.0003	9,000
3 COAL MINING	0	0
4 PETRO/NAT.GAS	0	0
5 MISC.MINING	0.0036	108,000
6 NEW CONST	0.4455	13,365,000
7 MAINT/REP CONST.	0.0098	294,000
8 FOOD/ KIND PROD.	0.0059	177,000
9 TEX MILL PRODS	0.0001	3,000
10 APPAREL	0.0031	93,000
11 PAPER PROD.	0.0016	48,000
12 PRINT/PUB	0.0034	102,000
13 CHEM/PETR REFNG	0.0022	66,000
14 RUB/LEATH PROD.	0.002	60,000
15 LUMB,WOOD/FURN.	0.0049	147,000
16 STONE/CLAY/GLS.	0.0158	474,000
17 METAL INDUS.	0.0011	33,000
18 FAB. METAL	0.0139	417,000
19 MACH.,NON-ELEC.	0.0027	81,000
20 ELEC./EQUIP.	0.0089	267,000
21 MOTOR VEHICLES	0.0002	6,000
22 TRANSP.EQ.	0.0013	39,000
23 INSTRUMENTS	0.0005	15,000
24 MISC. MFG.	0.0013	39,000
25 TRANSPORTATION	0.0227	681,000
26 COMMUNICATION	0.0068	204,000
27 ELEC/GAS/WATER	0.003	90,000
28 WHSALE. TRADE	0.0284	852,000
29 RETAIL TRADE	0.0501	1,503,000
30 FINANCE	0.008	240,000
31 INSURANCE	0.0103	309,000
32 REAL ESTATE	0.0037	111,000
33 HOT/LODG/AMUS	0.0056	168,000
34 PERSONAL SVCS	0.0074	222,000
35 BUSINESS SVCS	0.0638	1,914,000
36 EAT/DRINK	0.0139	417,000
37 HEALTH SVCS	0.0258	774,000
38 MISC. SVCS	0.0199	597,000
39 HOUSEHOLDS	0.0031	93,000
TOTAL	0.8058	24,174,000

impacts on industry earnings of a \$30 million military base expansion. To determine how each industry's earnings would be

affected by this expansion we can use the RIMS II tables found in Appendix C. From Appendix A, 'New military facilities' is classification 11.0701. This number identifies the column of earnings multipliers applicable to the 39 industries found in Appendix C. Output and Employment impacts can be calculated in a similar manner.

Figure 5-4 shows the derivation of estimates of the Earnings impacts of a \$30 million military base expansion using the multipliers from Appendix C. Column one reproduces the column under subsector 11.0701 from Appendix C. Each entry in column one is the dollar change in earnings that occurs in each row industry for each additional dollar of output delivered to final demand by this new military facilities construction. To obtain the dollar impact on the earnings of each row industry of an additional \$30 million expenditure by this new construction subsector, each entry in column one is multiplied by \$30 million. Column two shows the resulting impacts. In Figure 5-4, the column two total (Households excluded), \$24,174,000, is the dollar impact on the earnings of all industries. It represents the total dollar change in earnings of households employed by all industries (except Households itself) for the \$30 million expenditure.

CASE 3: DECREASE IN SINGLE FAMILY CONSTRUCTION

In 1982 single family contractors in Florida had receipts of \$1,739,372,000. As recent as 1981 Florida has experienced a 24%

annual decrease in value of single family construction. Single family construction is one of the most vulnerable of new construction subsectors to changes in economic conditions. It is highly sensitive to the interest rate (inflation). As can be determined from past experience a \$350 million annual decrease in single family construction is a realistic possibility. This case will estimate the impact on employment across all 39 industries of a \$350 million decrease in new single family construction.

From Appendix A, 'New residential 1-unit structures, nonfarm' is classification 11.0101. This number identifies the column of employment multipliers applicable to the 39 industries found in Appendix D.

Figure 5-5 shows the derivation of estimates of employment loss due to a \$350 million decrease in single family construction using multipliers from Appendix D. Column one reproduces the column under subsector 11.0101 from Appendix D. Each entry in column one represents the decrease in jobs in the row industry for each one million dollar decrease of output not delivered to final demand by the single family construction subsector. To obtain the employment impact on each row industry by this reduction in single family construction, each entry in column one is multiplied by 350 (millions). Column two shows the resulting employment loss estimates. In Figure 5-5, the column two total (Households excluded), 14,280, represents the employment loss in all industries including the single family construction but excluding Households that results from the \$350 million decrease

in single family construction. Output and Earnings impacts can be determined in a similar manner.

Figure 5-5 EMPLOYMENT IMPACT OF \$350 MILLION DECREASE IN NEW SINGLE FAMILY CONSTRUCTION

	EMPLOY. MULTIPLIER	JOBS
	<u>11.0101</u>	<u>LOST</u>
1 AGRICULTURE	0.3	105
2 FOREST & FISH	0	0
3 COAL MINING	0	0
4 PETRO/NAT.GAS	0	0
5 MISC.MINING	0.1	35
6 NEW CONST	18.2	6,370
7 MAINT/REP CONST.	0.5	175
8 FOOD/ KIND PROD.	0.2	70
9 TEX MILL PRODS	0	0
10 APPAREL	0.2	70
11 PAPER PROD.	0.1	35
12 PRINT/PUB	0.2	70
13 CHEM/PETR REFNG	0.1	35
14 RUB/LEATH PROD.	0.1	35
15 LUMB,WOOD/FURN.	1.6	560
16 STONE/CLAY/GLS.	0.7	245
17 METAL INDUS.	0	0
18 FAB. METAL	0.5	175
19 MACH.,NON-ELEC.	0.1	35
20 ELEC./EQUIP.	0.2	70
21 MOTOR VEHICLES	0	0
22 TRANSP.EQ.	0	0
23 INSTRUMENTS	0	0
24 MISC. MFG.	0.1	35
25 TRANSPORTATION	0.9	315
26 COMMUNICATION	0.2	70
27 ELEC/GAS/WATER	0.1	35
28 WHSALE. TRADE	1.8	630
29 RETAIL TRADE	5.4	1,890
30 FINANCE	0.3	105
31 INSURANCE	0.4	140
32 REAL ESTATE	0.4	140
33 HOT/LODG/AMUS	0.5	175
34 PERSONAL SVCS	0.7	245
35 BUSINESS SVCS	2.9	1,015
36 EAT/DRINK	1.7	595
37 HEALTH SVCS	0.9	315
38 MISC. SVCS	0.8	280
39 HOUSEHOLDS	0.5	175
TOTAL	40.8	14,280

in single family construction. Output and Earnings impacts can be determined in a similar manner.

Figure 5-5 EMPLOYMENT IMPACT OF \$350 MILLION DECREASE IN NEW SINGLE FAMILY CONSTRUCTION

	EMPLOY. MULTIPLIER	JOBS
	<u>11.0101</u>	<u>LOST</u>
1 AGRICULTURE	0.3	105
2 FOREST & FISH	0	0
3 COAL MINING	0	0
4 PETRO/NAT.GAS	0	0
5 MISC.MINING	0.1	35
6 NEW CONST	18.2	6,370
7 MAINT/REP CONST.	0.5	175
8 FOOD/ KIND PROD.	0.2	70
9 TEX MILL PRODS	0	0
10 APPAREL	0.2	70
11 PAPER PROD.	0.1	35
12 PRINT/PUB	0.2	70
13 CHEM/PETR REFNG	0.1	35
14 RUB/LEATH PROD.	0.1	35
15 LUMB,WOOD/FURN.	1.6	560
16 STONE/CLAY/GLS.	0.7	245
17 METAL INDUS.	0	0
18 FAB. METAL	0.5	175
19 MACH.,NON-ELEC.	0.1	35
20 ELEC./EQUIP.	0.2	70
21 MOTOR VEHICLES	0	0
22 TRANSP.EQ.	0	0
23 INSTRUMENTS	0	0
24 MISC. MFG.	0.1	35
25 TRANSPORTATION	0.9	315
26 COMMUNICATION	0.2	70
27 ELEC/GAS/WATER	0.1	35
28 WHSALE. TRADE	1.8	630
29 RETAIL TRADE	5.4	1,890
30 FINANCE	0.3	105
31 INSURANCE	0.4	140
32 REAL ESTATE	0.4	140
33 HOT/LODG/AMUS	0.5	175
34 PERSONAL SVCS	0.7	245
35 BUSINESS SVCS	2.9	1,015
36 EAT/DRINK	1.7	595
37 HEALTH SVCS	0.9	315
38 MISC. SVCS	0.8	280
39 HOUSEHOLDS	0.5	175
TOTAL	40.8	14,280

in single family construction. Output and Earnings impacts can be determined in a similar manner.

Figure 5-5 EMPLOYMENT IMPACT OF \$350 MILLION DECREASE IN NEW SINGLE FAMILY CONSTRUCTION

	EMPLOY. MULTIPLIER	JOBS
	<u>11.0101</u>	<u>LOST</u>
1 AGRICULTURE	0.3	105
2 FOREST & FISH	0	0
3 COAL MINING	0	0
4 PETRO/NAT.GAS	0	0
5 MISC.MINING	0.1	35
6 NEW CONST	18.2	6,370
7 MAINT/REP CONST.	0.5	175
8 FOOD/ KIND PROD.	0.2	70
9 TEX MILL PRODS	0	0
10 APPAREL	0.2	70
11 PAPER PROD.	0.1	35
12 PRINT/PUB	0.2	70
13 CHEM/PETR REFNG	0.1	35
14 RUB/LEATH PROD.	0.1	35
15 LUMB,WOOD/FURN.	1.6	560
16 STONE/CLAY/GLS.	0.7	245
17 METAL INDUS.	0	0
18 FAB. METAL	0.5	175
19 MACH.,NON-ELEC.	0.1	35
20 ELEC./EQUIP.	0.2	70
21 MOTOR VEHICLES	0	0
22 TRANSP.EQ.	0	0
23 INSTRUMENTS	0	0
24 MISC. MFG.	0.1	35
25 TRANSPORTATION	0.9	315
26 COMMUNICATION	0.2	70
27 ELEC/GAS/WATER	0.1	35
28 WHSALE. TRADE	1.8	630
29 RETAIL TRADE	5.4	1,890
30 FINANCE	0.3	105
31 INSURANCE	0.4	140
32 REAL ESTATE	0.4	140
33 HOT/LODG/AMUS	0.5	175
34 PERSONAL SVCS	0.7	245
35 BUSINESS SVCS	2.9	1,015
36 EAT/DRINK	1.7	595
37 HEALTH SVCS	0.9	315
38 MISC. SVCS	0.8	280
39 HOUSEHOLDS	0.5	175
TOTAL	40.8	14,280

CHAPTER 6.

SUMMARY AND CONCLUSIONS

There has been nearly constant economic growth in Florida since 1970. Only the recessions of 1974-76 and 1981-82 marred the upward trends of various economic indicators. As Florida's population has increased by 70%, its economic indicators have climbed at even greater rates. Nonagricultural employment rose 107%, gross sales rose 510%, and total state personal income rose 518%. The construction industry directly accounts for 7.5% of Florida's employment, and indirectly for much more.

The construction industry is an important part of the economy of Florida. The impact of the construction industry itself is large, but construction also permeates many other segments of Florida's economy. For example, about 34% of the mining industry is directly related to construction, as is 12.4% of manufacturing employment, and 5% of wholesale and retail trade employment. The construction industry is also closely tied to the finance, insurance, and real estate industry, services, forestry, and even government. The construction industry provides Florida government with a large tax base through sales taxes, other taxes, and licensing fees. However, the construction industry is very volatile; construction falls off rapidly in times of recession. Sales tax revenues from the construction industry dropped from 11.1% of state revenues in 1974, to only 7.0% in 1983. Construction related employment is

nearly as volatile as the construction industry itself, dropping dramatically in times of recession. A strong construction industry is important to the other sectors of the economy of Florida.

Chapter 3 presented data on several subsections of the construction, mining, and mobile homes industries. Division of the construction industry into categories developed by the U. S. Census, Department of Labor, University of Florida Bureau of Economic and Business Research, Standard Industrial Classification Codes, and Florida Contractors' Licensing Law aided discussion. Florida's mining industry is closely tied to the construction industry, since much mining activity centers on construction materials such as limestone, dolomite, coquina, and sand. Like construction, mining activity declines in times of recession; nevertheless, a moderate growth rate for mining is forecast. Ten major categories of the construction industry were discussed, and several of these were subdivided into 19 additional categories. Maps presented data on areas of high economic impact in these categories. Employment figures, total construction receipts, and value added were compared for the years 1977 and 1982. Total construction receipts and value added increased in all cases, although it should be noted that no correction for inflation was made. Employment figures increased in all categories except Florida Operative Builders (down 10%), Industrial and Warehouse construction (down 2.5%) and Highway and Street construction (down 4.6%). These census figures for

employment, total receipts, value added, and 1982 net receipts were summarized in Table 3-6. The use of mobile homes is on the increase in Florida. The mobile home industry is a potential growth area in the Florida economy.

Construction employment and receipts in Florida are considerably higher than the national average, and Florida had four of the nation's top 20 housing markets for 1986. The outlook for Florida's construction industry is favorable.

Chapter 4 defined four types of economic impacts: direct, indirect, induced, and total impacts. Direct economic impacts are associated with the actual production of a product. Indirect economic impacts are additional economic activity generated, for example through subcontracts. Induced economic impact includes the spending of wages by workers. Total economic impact is the sum of direct, indirect, and induced impacts. Economic impact must be seen as a chain reaction of spending characterized by a multiplier effect - the total respending which results from a given dollar increase in the output of an industry.

Input-Output modelling is a type of analysis developed to show economic interrelationships between industries. A matrix is developed listing output down the left and the purchasers of inputs across the top. The sum of the outputs must equal the sum of the inputs. Input-Output analysis involves three phases. The first phase, Transactions, shows the flow of goods and services in dollar amounts for one year. The second phase, Technical Coefficients, shows the amount of input required from the

industry at the left for each dollar of output produced by the industry at the top. These Technical Coefficients can be used to calculate the amount of direct purchase requirements as a result of an increase or decrease in the output of one or more of the purchasing industries. The third phase, Total Requirements, is used to obtain multipliers for computing the total impact of any sector in this economy.

Multipliers measure the ripple effect of change in final demand of one industry on the whole economy. There are three types of multipliers: Output multipliers, Earnings multipliers, and Employment multipliers. Output multipliers show what is needed from other industries as demand changes. Industries with large output multipliers have a large percentage of the required inputs coming from within the local economy. Earnings multipliers reflect the impact of change in income and should be interpreted with caution when dealing with their changes in output. A high earnings multiplier indicates strong structural ties with other local industries. Employment multipliers indicate the employment directly required per one million dollar change in final demand.

With these background factors in mind, the chapter proceeds to develop a construction based Input-Output model for the state of Florida. For the purpose of this model, sectors of the economy defined by the Standard Industrial Classification (SIC) Code of the U. S. Office of Management and Budget was utilized, yielding 39 sectors. The initial version of this study used a

study by the Institute of Food and Agricultural Sciences at the University of Florida. The input-output model presented in this updated report is based on data from the U.S. Department of Commerce RIMS II system.

The results of the RIMS II Input-Output analysis were discussed in Chapter 5. Florida's construction industry has a high impact on the economy of the state as demonstrated by the analysis. High income multipliers indicate that the construction industry is closely tied to other Florida industries. The high output multipliers show that for every dollar increase in final demand for new construction, an additional \$1.11 of economic activity is generated in other sectors of Florida's economy. High employment multipliers demonstrate a high level of interaction that the construction industry has with employment in other sectors of the Florida economy. High earnings and output multipliers indicate that growth in the construction industry adds even greater growth to other sectors of Florida's economy.

Taken together, the data presented in this report show that the construction industry has a profound impact on the economy of the state of Florida. The construction industry is closely tied in with other segments of Florida's economy. A healthy construction industry is vital to the future of Florida.

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APPENDIX A

INPUT/OUTPUT MODEL CONSTRUCTION INDUSTRY CLASSIFICATIONS

NEW CONSTRUCTION

- 11.0101 New residential 1-unit structures, nonfarm
- 11.0102 New residential 2-4 unit structures, nonfarm
- 11.0103 New residential garden apartments
- 11.0104 New residential high-rise apartments
- 11.0105 New residential additions and alterations, nonfarm
- 11.0106 New hotels and motels
- 11.0107 New dormitories and other group housing
- 11.0201 New industrial buildings
- 11.0202 new office buildings
- 11.0203 New warehouses
- 11.0204 New garages and service stations
- 11.0205 New stores and restaurants
- 11.0206 New religious buildings
- 11.0207 New educational buildings
- 11.0231 New hospitals
- 11.0232 New resident. institutions & other health related facil.
- 11.0241 New amusement and recreation buildings
- 11.0250 Other new nonfarm buildings
- 11.0301 New telephone and telegraph facilities
- 11.0302 New railroads
- 11.0303 New electric utility facilities
- 11.0304 New gas utility facilities
- 11.0305 New petroleum facilities
- 11.0306 New water supply facilities
- 11.0307 New sewer system facilities
- 11.0308 New local transit facilities
- 11.0400 New highways and streets
- 11.0501 New farm housing units and additions and alterations
- 11.0502 New farmservice facilities
- 11.0601 New petroleum and natural gas well drilling
- 11.0602 New petroleum, natural gas and solid mineral exploration
- 11.0603 New access structures for solid mineral development
- 11.0701 New military facilities
- 11.0702 New dams and reservoirs
- 11.0703 Other new conservation and development facilities
- 11.0704 Other new nonbuilding facilities
- 61.0602 Mobile homes (included in manufacturing)

APPENDIX A (CONTINUED)

INPUT/OUTPUT MODEL CONSTRUCTION INDUSTRY CLASSIFICATIONS

MAINTENANCE AND REPAIR CONSTRUCTION

- 12.0100 Maintenance and repair, residential
- 12.0201 Maintenance and repair of other nonfarm buildings
- 12.0202 Maintenance and repair of farm residential buildings
- 12.0203 Maintenance and repair of farm service facilities
- 12.0204 Maint.& repair of telegraph and telephone facilities
- 12.0205 Maintenance and repair of railroads

- 12.0206 Maintenance and repair of electric utility facilities
- 12.0207 Maintenance and repair of gas utility facilities
- 12.0208 Maintenance and repair of petroleum pipelines
- 12.0209 Maintenance and repair of water supply facilities
- 12.0210 Maintenance and repair of sewer facilities
- 12.0211 Maintenance and repair of local transit facilities
- 12.0212 Maintenance and repair of military facilities
- 12.0213 Maint.& repair of conservation & developm. facilities
- 12.0214 Maintenance and repair of highways and streets
- 12.0215 Maint.& repair of petroleum & natural gas wells
- 12.0216 Maint.& repair of other nonbuilding facilities

APPENDIX B
OUTPUT MULTIPLIERS (Dollars)

	61.0602	11.0101	11.0102	11.0103	11.0104
AGRICULTURE	0.0074	0.0116	0.0117	0.0110	0.0108
FOREST & FISH	0.0014	0.0016	0.0013	0.0011	0.0008
COAL MINING	0.0000	0.0000	0.0000	0.0000	0.0000
PETRO/NAT.GAS	0.0001	0.0001	0.0001	0.0001	0.0001
MISC.MINING	0.0009	0.0067	0.0067	0.0059	0.0049
NEW CONST	0.0000	1.0000	1.0000	1.0000	1.0000
MAINT/REP CONST	0.0170	0.0207	0.0222	0.0206	0.0199
FOOD/ KIND PROD	0.0222	0.0333	0.0346	0.0340	0.0318
TEX MILL PRODS	0.0013	0.0005	0.0005	0.0005	0.0005
APPAREL	0.0078	0.0086	0.0098	0.0094	0.0098
PAPER PROD.	0.0072	0.0086	0.0091	0.0094	0.0090
PRINT/PUB	0.0086	0.0120	0.0125	0.0122	0.0116
CHEM/PETR REFNG	0.0148	0.0194	0.0217	0.0195	0.0134
RUB/LEATH PROD.	0.0089	0.0065	0.0089	0.0132	0.0090
LUMB,WOOD/FURN.	0.0780	0.1025	0.0880	0.0924	0.0541
STONE/CLAY/GLS.	0.0249	0.0648	0.0589	0.0533	0.0553
METAL INDUS.	0.0105	0.0047	0.0057	0.0069	0.0089
FAB. METAL	0.0835	0.0421	0.0422	0.0501	0.1113
MACH.,NON-ELEC.	0.0047	0.0067	0.0080	0.0131	0.0137
ELEC./EQUIP.	0.0100	0.0110	0.0121	0.0116	0.0135
MOTOR VEHICLES	0.0026	0.0009	0.0009	0.0009	0.0010
TRANSP.EQ.	1.0037	0.0028	0.0029	0.0029	0.0031
INSTRUMENTS	0.0014	0.0017	0.0018	0.0019	0.0022
MISC. MFG.	0.0026	0.0031	0.0034	0.0032	0.0038
TRANSPORTATION	0.0351	0.0481	0.0480	0.0464	0.0445
COMMUNICATION	0.0182	0.0253	0.0273	0.0273	0.0266
ELEC/GAS/WATER	0.0181	0.0251	0.0262	0.0258	0.0243
WHSALE. TRADE	0.1017	0.0969	0.0932	0.0925	0.0842
RETAIL TRADE	0.0489	0.1398	0.1497	0.1447	0.1287
FINANCE	0.0155	0.0217	0.0226	0.0211	0.0210
INSURANCE	0.0135	0.0249	0.0265	0.0261	0.0247
REAL ESTATE	0.0694	0.1079	0.1123	0.1101	0.1001
HOT/LODG/AMUS	0.0095	0.0136	0.0142	0.0139	0.0130
PERSONAL SVCS	0.0094	0.0130	0.0137	0.0134	0.0125
BUSINESS SVCS	0.0366	0.0776	0.0813	0.0734	0.0793
EAT/DRINK	0.0293	0.0381	0.0389	0.0384	0.0410
HEALTH SVCS	0.0233	0.0366	0.0381	0.0375	0.0336
MISC. SVCS	0.0249	0.0403	0.0424	0.0412	0.0479
HOUSEHOLDS	0.4249	0.6676	0.6950	0.6826	0.6128
TOTAL/1/	1.7728	2.0786	2.0974	2.0854	2.0701

1. Each column total is the sum of the entries in rows 1-38; these entries include earnings paid to HOUSEHOLDS employed in industries 1-38. Column totals exclude earnings to HOUSEHOLDS. Each entry represents the dollar change in output that occurs in the row industry for each dollar of column industry output.

APPENDIX B
OUTPUT MULTIPLIERS (Dollars)

	11.0105	11.0106	11.01067	11.0201	11.0202
AGRICULTURE	0.0109	0.0112	0.0104	0.011	0.0115
FOREST & FISH	0.0013	0.0008	0.0008	0.0007	0.0007
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0.0001	0.001	0.0001	0.0001	0.0001
MISC.MINING	0.0085	0.0085	0.0054	0.004	0.0064
NEW CONST	1	1	1	1	1
MAINT/REP CONST	0.0207	0.0209	0.0216	0.0201	0.0207
FOOD/ KIND PROD	0.0319	0.0344	0.0354	0.0359	0.0354
TEX MILL PRODS	0.0004	0.0005	0.0005	0.0005	0.0005
APPAREL	0.0083	0.0097	0.0098	0.0095	0.0093
PAPER PROD.	0.0106	0.0089	0.0088	0.0077	0.0095
PRINT/PUB	0.013	0.0119	0.0121	0.0117	0.0121
CHEM/PETR REFNG	0.0318	0.0176	0.0124	0.0104	0.019
RUB/LEATH PROD.	0.0119	0.0116	0.0066	0.0053	0.0079
LUMB,WOOD/FURN.	0.1145	0.0387	0.0539	0.021	0.0369
STONE/CLAY/GLS.	0.0565	0.0838	0.0575	0.0314	0.0464
METAL INDUS.	0.0055	0.0094	0.0117	0.0055	0.0077
FAB. METAL	0.0585	0.0869	0.1325	0.0908	0.1041
MACH.,NON-ELEC.	0.0054	0.0132	0.0092	0.0137	0.0166
ELEC./EQUIP.	0.013	0.0157	0.0107	0.0156	0.0145
MOTOR VEHICLES	0.0009	0.001	0.001	0.001	0.001
TRANSP.EQ.	0.0027	0.0031	0.0032	0.0036	0.0035
INSTRUMENTS	0.0015	0.0031	0.0024	0.0024	0.0024
MISC. MFG.	0.0035	0.004	0.0043	0.0033	0.0034
TRANSPORTATION	0.0484	0.0448	0.0435	0.0434	0.0465
COMMUNICATION	0.0261	0.0269	0.0274	0.0259	0.0269
ELEC/GAS/WATER	0.0253	0.0254	0.0256	0.0248	0.0256
WHSALE. TRADE	0.0989	0.0819	0.0788	0.0767	0.0837
RETAIL TRADE	0.1614	0.1105	0.1144	0.105	0.107
FINANCE	0.0204	0.0223	0.0227	0.0228	0.0227
INSURANCE	0.0233	0.0258	0.0266	0.0263	0.0263
REAL ESTATE	0.1061	0.109	0.1124	0.114	0.113
HOT/LODG/AMUS	0.0133	0.0145	0.0148	0.0153	0.0152
PERSONAL SVCS	0.0128	0.0137	0.0142	0.0141	0.014
BUSINESS SVCS	0.089	0.1134	0.1028	0.1014	0.1127
EAT/DRINK	0.0365	0.041	0.0408	0.0398	0.0404
HEALTH SVCS	0.035	0.0374	0.0389	0.0398	0.039
MISC. SVCS	0.0401	0.0451	0.0454	0.044	0.0465
HOUSEHOLDS	0.6374	0.6816	0.7089	0.7258	0.7099
TOTAL/1/	2.1483	2.1067	2.1187	1.9985	2.0892

APPENDIX B
OUTPUT MULTIPLIERS (Dollars)

	11.0203	11.0204	11.0205	11.0206	11.0207
AGRICULTURE	0.0114	0.0108	0.0115	0.0121	0.0121
FOREST & FISH	0.0009	0.0008	0.0007	0.0008	0.0007
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0.0001	0.0001	0.0001	0.0001	0.0001
MISC.MINING	0.0045	0.0063	0.0078	0.0066	0.005
NEW CONST	1	1	1	1	1
MAINT/REP CONST	0.0221	0.022	0.021	0.0222	0.0215
FOOD/ KIND PROD	0.0376	0.0371	0.0353	0.0377	0.0369
TEX MILL PRODS	0.0005	0.0005	0.0005	0.0005	0.0005
APPAREL	0.0098	0.0099	0.0095	0.0102	0.0098
PAPER PROD.	0.0081	0.0076	0.0087	0.0079	0.0099
PRINT/PUB	0.0126	0.0126	0.0122	0.0129	0.0126
CHEM/PETR REFNG	0.0103	0.0139	0.02	0.0134	0.0217
RUB/LEATH PROD.	0.0085	0.0049	0.0086	0.005	0.0094
LUMB,WOOD/FURN.	0.0501	0.0337	0.0322	0.0273	0.0342
STONE/CLAY/GLS.	0.0576	0.0823	0.0567	0.0817	0.0606
METAL INDUS.	0.0092	0.0088	0.0081	0.0073	0.0078
FAB. METAL	0.1447	0.1128	0.1084	0.0813	0.0955
MACH.,NON-ELEC.	0.0084	0.0334	0.0143	0.0068	0.0093
ELEC./EQUIP.	0.023	0.0078	0.0154	0.0117	0.0178
MOTOR VEHICLES	0.001	0.0011	0.001	0.001	0.001
TRANSP.EQ.	0.0039	0.0035	0.0036	0.0032	0.0036
INSTRUMENTS	0.0019	0.0015	0.0029	0.0028	0.0028
MISC. MFG.	0.0034	0.0036	0.0037	0.0037	0.0035
TRANSPORTATION	0.0436	0.0445	0.048	0.0496	0.0451
COMMUNICATION	0.0285	0.0285	0.0268	0.029	0.029
ELEC/GAS/WATER	0.0266	0.0264	0.0259	0.0269	0.0265
WHSALE. TRADE	0.0766	0.074	0.0852	0.0778	0.081
RETAIL TRADE	0.1147	0.1135	0.1107	0.1161	0.1095
FINANCE	0.024	0.0236	0.0228	0.024	0.0235
INSURANCE	0.0276	0.0275	0.0263	0.028	0.027
REAL ESTATE	0.1192	0.1176	0.1126	0.1202	0.1183
HOT/LODG/AMUS	0.016	0.0158	0.0151	0.016	0.0159
PERSONAL SVCS	0.0148	0.0148	0.0143	0.0154	0.0148
BUSINESS SVCS	0.1072	0.1264	0.1073	0.139	0.1269
EAT/DRINK	0.0421	0.0418	0.0402	0.042	0.0416
HEALTH SVCS	0.0416	0.041	0.0388	0.0418	0.0408
MISC. SVCS	0.0468	0.0497	0.0491	0.0605	0.0464
HOUSEHOLDS	0.7571	0.7464	0.7071	0.7618	0.7434
TOTAL/1/	2.1588	2.1598	2.1052	2.1417	2.1227

APPENDIX B
OUTPUT MULTIPLIERS (Dollars)

	11.0231	11.0232	11.0241	11.025	11.0301
AGRICULTURE	0.0119	0.013	0.012	0.0125	0.0113
FOREST & FISH	0.0007	0.0008	0.0008	0.0008	0.0008
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0.0001	0.0001	0.0001	0.0001	0.0001
MISC.MINING	0.0068	0.0057	0.0067	0.0064	0.0022
NEW CONST	1	1	1	1	1
MAINT/REP CONST	0.0211	0.0217	0.0216	0.0205	0.0189
FOOD/ KIND PROD	0.0359	0.0375	0.0369	0.0371	0.0363
TEX MILL PRODS	0.0005	0.0005	0.0005	0.0005	0.0005
APPAREL	0.0097	0.0099	0.0098	0.0099	0.0095
PAPER PROD.	0.009	0.009	0.0086	0.0092	0.0065
PRINT/PUB	0.0122	0.0128	0.0128	0.0128	0.0113
CHEM/PETR REFNG	0.0177	0.0143	0.0145	0.0208	0.0139
RUB/LEATH PROD.	0.0099	0.0087	0.0078	0.0069	0.0035
LUMB,WOOD/FURN.	0.0196	0.0553	0.0428	0.0362	0.0226
STONE/CLAY/GLS.	0.0628	0.0682	0.0776	0.0657	0.0242
METAL INDUS.	0.0085	0.0084	0.0082	0.0077	0.033
FAB. METAL	0.0838	0.0904	0.0864	0.0744	0.0235
MACH.,NON-ELEC.	0.0172	0.0105	0.0137	0.0119	0.0036
ELEC./EQUIP.	0.015	0.0154	0.013	0.0153	0.0139
MOTOR VEHICLES	0.001	0.001	0.001	0.001	0.0011
TRANSP.EQ.	0.0034	0.0033	0.0035	0.0033	0.0028
INSTRUMENTS	0.0034	0.0025	0.0024	0.003	0.0018
MISC. MFG.	0.0035	0.0038	0.0035	0.0039	0.0032
TRANSPORTATION	0.0467	0.0424	0.0439	0.0452	0.0359
COMMUNICATION	0.0283	0.0281	0.0271	0.0279	0.0245
ELEC/GAS/WATER	0.026	0.027	0.0267	0.0268	0.0242
WHSALE. TRADE	0.0836	0.083	0.0792	0.0815	0.0739
RETAIL TRADE	0.1109	0.1224	0.1187	0.1207	0.09
FINANCE	0.023	0.0238	0.0235	0.0235	0.0205
INSURANCE	0.0265	0.0275	0.0274	0.0273	0.0229
REAL ESTATE	0.1144	0.1196	0.1175	0.118	0.1133
HOT/LODG/AMUS	0.0153	0.0159	0.0158	0.0158	0.0143
PERSONAL SVCS	0.0145	0.015	0.0149	0.0151	0.0142
BUSINESS SVCS	0.1124	0.1129	0.1311	0.1268	0.1097
EAT/DRINK	0.0406	0.0419	0.0422	0.0421	0.0395
HEALTH SVCS	0.0396	0.0416	0.0405	0.0408	0.0406
MISC. SVCS	0.0496	0.0502	0.0515	0.051	0.042
HOUSEHOLDS	0.7214	0.7574	0.7385	0.7427	0.7395
TOTAL/1/	2.085	2.1442	2.1441	2.1224	1.9098

APPENDIX B
OUTPUT MULTIPLIERS (Dollars)

	11.0302	11.0303	11.0304	11.0305	11.0306
AGRICULTURE	0.0112	0.0117	0.0114	0.0118	0.0104
FOREST & FISH	0.001	0.0008	0.0007	0.0007	0.0006
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0.0001	0.0001	0.0001	0.0001	0.0001
MISC.MINING	0.0146	0.0077	0.0055	0.0026	0.0059
NEW CONST	1	1	1	1	1
MAINT/REP CONST	0.0213	0.0219	0.0213	0.0206	0.021
FOOD/ KIND PROD	0.0379	0.0391	0.0385	0.0376	0.0358
TEX MILL PRODS	0.0005	0.0005	0.0005	0.0005	0.0005
APPAREL	0.0099	0.0101	0.0101	0.0103	0.0094
PAPER PROD.	0.0073	0.0073	0.0071	0.0068	0.0068
PRINT/PUB	0.0117	0.013	0.0137	0.0133	0.0125
CHEM/PETR REFNG	0.0103	0.0113	0.01	0.0095	0.0089
RUB/LEATH PROD.	0.0041	0.0047	0.0039	0.004	0.005
LUMB,WOOD/FURN.	0.054	0.025	0.0047	0.0057	0.0048
STONE/CLAY/GLS.	0.0321	0.0465	0.0242	0.0212	0.0587
METAL INDUS.	0.0089	0.0074	0.0074	0.008	0.0154
FAB. METAL	0.0739	0.0899	0.0782	0.0581	0.0675
MACH.,NON-ELEC.	0.0056	0.0061	0.0073	0.0036	0.0057
ELEC./EQUIP.	0.0318	0.0165	0.006	0.0076	0.0051
MOTOR VEHICLES	0.001	0.0011	0.001	0.001	0.0011
TRANSP.EQ.	0.0036	0.0038	0.0037	0.0034	0.0037
INSTRUMENTS	0.002	0.0023	0.0018	0.0018	0.0017
MISC. MFG.	0.0037	0.0034	0.0034	0.0035	0.0032
TRANSPORTATION	0.0629	0.0456	0.0497	0.0472	0.0492
COMMUNICATION	0.0262	0.0267	0.028	0.0272	0.0277
ELEC/GAS/WATER	0.0259	0.0267	0.0259	0.0252	0.0251
WHSALE. TRADE	0.0709	0.0747	0.0711	0.0698	0.0669
RETAIL TRADE	0.0959	0.1045	0.0916	0.089	0.0854
FINANCE	0.024	0.0236	0.0252	0.0248	0.0241
INSURANCE	0.0277	0.0265	0.028	0.0276	0.0264
REAL ESTATE	0.119	0.1244	0.1229	0.1203	0.1147
HOT/LODG/AMUS	0.0157	0.0168	0.0181	0.0176	0.0164
PERSONAL SVCS	0.0153	0.0155	0.0156	0.0157	0.0147
BUSINESS SVCS	0.0891	0.1655	0.2486	0.2387	0.2074
EAT/DRINK	0.0412	0.0432	0.044	0.042	0.0402
HEALTH SVCS	0.0423	0.0434	0.0425	0.0417	0.0396
MISC. SVCS	0.0484	0.0479	0.052	0.0508	0.0521
HOUSEHOLDS	0.7711	0.7915	0.7735	0.7597	0.7221
TOTAL/1/	2.0508	2.1152	2.1237	2.0695	2.0736

APPENDIX B
OUTPUT MULTIPLIERS (Dollars)

	11.0307	11.0308	11.04	11.0501	11.0502
AGRICULTURE	0.0114	0.0113	0.0168	0.0122	0.0122
FOREST & FISH	0.0007	0.0008	0.0007	0.0012	0.001
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0.0001	0.0002	0.0002	0.0001	0.0002
MISC.MINING	0.0092	0.0142	0.0308	0.0059	0.0061
NEW CONST	1	1	1	1	1
MAINT/REP CONST	0.0221	0.0226	0.0228	0.0209	0.0217
FOOD/ KIND PROD	0.0383	0.037	0.0363	0.0325	0.0373
TEX MILL PRODS	0.0005	0.0005	0.0005	0.0005	0.0005
APPAREL	0.01	0.0095	0.0095	0.0087	0.01
PAPER PROD.	0.0077	0.0074	0.0077	0.0096	0.0092
PRINT/PUB	0.0136	0.0132	0.0129	0.0126	0.0127
CHEM/PETR REFNG	0.0151	0.0211	0.0637	0.0238	0.0182
RUB/LEATH PROD.	0.0053	0.0039	0.0038	0.006	0.01
LUMB,WOOD/FURN.	0.007	0.0191	0.0084	0.1309	0.0279
STONE/CLAY/GLS.	0.0825	0.1198	0.0971	0.0633	0.0463
METAL INDUS.	0.0085	0.0061	0.006	0.0055	0.01
FAB. METAL	0.0545	0.0913	0.0759	0.0646	0.1018
MACH.,NON-ELEC.	0.0407	0.0061	0.0033	0.0056	0.0038
ELEC./EQUIP.	0.0073	0.0132	0.013	0.0078	0.0089
MOTOR VEHICLES	0.0011	0.0011	0.001	0.0009	0.001
TRANSP.EQ.	0.0035	0.0035	0.0034	0.0028	0.0031
INSTRUMENTS	0.0018	0.002	0.0015	0.0014	0.0016
MISC. MFG.	0.0035	0.0039	0.0087	0.0034	0.0034
TRANSPORTATION	0.0512	0.0634	0.0682	0.0498	0.0489
COMMUNICATION	0.0301	0.029	0.028	0.0271	0.0291
ELEC/GAS/WATER	0.0269	0.0269	0.0273	0.0255	0.0262
WHSALE. TRADE	0.0813	0.0673	0.0725	0.0943	0.0802
RETAIL TRADE	0.0913	0.0916	0.0895	0.1542	0.1232
FINANCE	0.0254	0.025	0.0241	0.0196	0.0236
INSURANCE	0.0282	0.0279	0.0268	0.0249	0.0271
REAL ESTATE	0.1225	0.1188	0.1175	0.107	0.1184
HOT/LODGM/AMUS	0.0176	0.0169	0.0163	0.0136	0.0149
PERSONAL SVCS	0.0155	0.0152	0.0147	0.0132	0.015
BUSINESS SVCS	0.2179	0.2047	0.1927	0.098	0.1129
EAT/DRINK	0.0436	0.0425	0.0415	0.0372	0.0411
HEALTH SVCS	0.0422	0.0408	0.04	0.0356	0.0413
MISC. SVCS	0.0526	0.0524	0.0527	0.044	0.05
HOUSEHOLDS	0.769	0.7431	0.7293	0.649	0.753
TOTAL/1/	2.1908	2.2303	2.2359	2.164	2.0988

APPENDIX B
OUTPUT MULTIPLIERS (Dollars)

	11.0601	11.0602	11.0603	11.0701	11.0702
AGRICULTURE	0.009	0.0124	0.0105	0.0134	0.0121
FOREST & FISH	0.0005	0.0007	0.0008	0.0008	0.0008
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0.0001	0.0001	0.0001	0.0001	0.0002
MISC.MINING	0.0024	0.0008	0.0074	0.0125	0.0088
NEW CONST	1	1	1	1	1
MAINT/REP CONST	0.0177	0.0204	0.0201	0.0221	0.0234
FOOD/ KIND PROD	0.0311	0.0433	0.036	0.0399	0.042
TEX MILL PRODS	0.0004	0.0006	0.0005	0.0006	0.0006
APPAREL	0.008	0.0119	0.0097	0.0109	0.0122
PAPER PROD.	0.0055	0.0071	0.0069	0.0083	0.0076
PRINT/PUB	0.0101	0.0121	0.0105	0.0128	0.015
CHEM/PETR REFNG	0.0091	0.0126	0.0151	0.0172	0.0096
RUB/LEATH PROD.	0.0033	0.0067	0.0081	0.0063	0.0047
LUMB,WOOD/FURN.	0.004	0.0071	0.0264	0.0172	0.007
STONE/CLAY/GLS.	0.0164	0.007	0.0902	0.0641	0.0399
METAL INDUS.	0.0104	0.0026	0.0071	0.0057	0.0038
FAB. METAL	0.0375	0.0302	0.0575	0.0537	0.0587
MACH.,NON-ELEC.	0.0052	0.002	0.0058	0.0098	0.0037
ELEC./EQUIP.	0.0049	0.013	0.0127	0.0236	0.005
MOTOR VEHICLES	0.0009	0.0011	0.001	0.0012	0.0012
TRANSP.EQ.	0.0039	0.0034	0.0033	0.0039	0.0039
INSTRUMENTS	0.0014	0.0017	0.0015	0.0022	0.0019
MISC. MFG.	0.0027	0.0035	0.0033	0.0046	0.0039
TRANSPORTATION	0.0689	0.0441	0.0606	0.0554	0.0683
COMMUNICATION	0.0235	0.0259	0.0228	0.0258	0.0326
ELEC/GAS/WATER	0.0204	0.0266	0.0237	0.0273	0.0283
WHSALE. TRADE	0.0689	0.0603	0.0636	0.0726	0.0661
RETAIL TRADE	0.0736	0.1058	0.0936	0.1009	0.104
FINANCE	0.0225	0.0282	0.0192	0.0254	0.0252
INSURANCE	0.0617	0.0273	0.023	0.0288	0.0305
REAL ESTATE	0.1004	0.1339	0.1094	0.125	0.1349
HOT/LODG/AMUS	0.0124	0.0152	0.0128	0.0168	0.0198
PERSONAL SVCS	0.012	0.0164	0.0139	0.0159	0.0169
BUSINESS SVCS	0.0988	0.0635	0.05	0.1214	0.2833
EAT/DRINK	0.0351	0.0456	0.0386	0.0445	0.0472
HEALTH SVCS	0.0344	0.0486	0.0402	0.0442	0.0466
MISC. SVCS	0.0514	0.054	0.0431	0.0564	0.063
HOUSEHOLDS	0.6231	0.8855	0.7323	0.8058	0.8485
TOTAL/1/	1.8677	1.8958	1.9491	2.0911	2.2325

APPENDIX B
OUTPUT MULTIPLIERS (Dollars)

	11.0703	11.0704	12.01	12.0201	12.0202
AGRICULTURE	0.0122	0.0158	0.0114	0.012	0.012
FOREST & FISH	0.0009	0.0008	0.0008	0.0008	0.001
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0.0002	0.0002	0.0001	0.0001	0.0001
MISC.MINING	0.0185	0.0193	0.0074	0.005	0.0105
NEW CONST	1	1	0	0	0
MAINT/REP CONST	0.024	0.0231	1.0207	1.0206	1.0194
FOOD/ KIND PROD	0.0421	0.0383	0.0347	0.0387	0.0328
TEX MILL PRODS	0.0006	0.0005	0.0005	0.0005	0.0005
APPAREL	0.0114	0.0102	0.0102	0.01	0.0088
PAPER PROD.	0.0081	0.0078	0.0101	0.0095	0.0094
PRINT/PUB	0.0153	0.0135	0.0124	0.0123	0.0112
CHEM/PETR REFNG	0.0106	0.0299	0.0467	0.0228	0.0496
RUB/LEATH PROD.	0.0057	0.0054	0.0134	0.0132	0.0089
LUMB,WOOD/FURN.	0.0339	0.0266	0.0324	0.0188	0.0517
STONE/CLAY/GLS.	0.0511	0.0573	0.0405	0.032	0.0471
METAL INDUS.	0.0037	0.0068	0.0063	0.0052	0.0063
FAB. METAL	0.047	0.0956	0.073	0.0591	0.0375
MACH.,NON-ELEC.	0.0032	0.0049	0.0109	0.0093	0.0075
ELEC./EQUIP.	0.0047	0.0186	0.0098	0.0121	0.0088
MOTOR VEHICLES	0.0012	0.0011	0.001	0.001	0.0009
TRANSP.EQ.	0.0035	0.0037	0.0029	0.0032	0.0027
INSTRUMENTS	0.0017	0.0017	0.0022	0.0023	0.0016
MISC. MFG.	0.0039	0.0058	0.0037	0.0036	0.0034
TRANSPORTATION	0.0645	0.0646	0.0448	0.0409	0.0481
COMMUNICATION	0.0333	0.0304	0.0267	0.0281	0.0228
ELEC/GAS/WATER	0.0291	0.0274	0.0257	0.0267	0.0244
WHSALE. TRADE	0.0656	0.0741	0.095	0.0811	0.0893
RETAIL TRADE	0.1019	0.0989	0.1576	0.1404	0.1237
FINANCE	0.0255	0.0249	0.0229	0.0252	0.0232
INSURANCE	0.0306	0.0285	0.0239	0.0259	0.0238
REAL ESTATE	0.1359	0.1232	0.1121	0.1219	0.1042
HOT/LODG/AMUS	0.0202	0.0176	0.0136	0.0144	0.0127
PERSONAL SVCS	0.0169	0.0155	0.0136	0.0148	0.0129
BUSINESS SVCS	0.3064	0.205	0.0453	0.0441	0.048
EAT/DRINK	0.0474	0.0432	0.0388	0.0419	0.0371
HEALTH SVCS	0.0466	0.0423	0.0384	0.0431	0.0361
MISC. SVCS	0.0613	0.0535	0.0405	0.0431	0.0378
HOUSEHOLDS	0.8489	0.7702	0.6993	0.7864	0.6583
TOTAL/1/	2.2883	2.2359	2.0501	1.984	1.9758

APPENDIX B
OUTPUT MULTIPLIERS (Dollars)

	12.0203	12.0204	12.0205	12.0206	12.0207
AGRICULTURE	0.0105	0.0517	0.0131	0.1034	0.0094
FOREST & FISH	0.001	0.001	0.0014	0.0009	0.0006
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0.0001	0.0001	0.0001	0.0001	0.0001
MISC.MINING	0.0185	0.0019	0.0117	0.0037	0.0127
NEW CONST	0	0	0	0	0
MAINT/REP CONST	1.0197	1.0245	1.0213	1.0231	1.018
FOOD/ KIND PROD	0.0322	0.0531	0.0425	0.0424	0.0323
TEX MILL PRODS	0.0005	0.0007	0.0005	0.0005	0.0004
APPAREL	0.0088	0.0138	0.0109	0.0111	0.0084
PAPER PROD.	0.0074	0.0085	0.0074	0.0074	0.0065
PRINT/PUB	0.0109	0.014	0.0119	0.0121	0.0096
CHEM/PETR REFNG	0.031	0.0123	0.0096	0.0142	0.0411
RUB/LEATH PROD.	0.0074	0.0047	0.0039	0.0038	0.0042
LUMB,WOOD/FURN.	0.0418	0.0136	0.0473	0.0267	0.0048
STONE/CLAY/GLS.	0.0666	0.0123	0.0157	0.0205	0.0569
METAL INDUS.	0.0101	0.0054	0.0065	0.0081	0.0077
FAB. METAL	0.0623	0.0168	0.0465	0.0735	0.0778
MACH.,NON-ELEC.	0.0041	0.0022	0.0035	0.0037	0.0041
ELEC./EQUIP.	0.0165	0.008	0.0189	0.0164	0.0077
MOTOR VEHICLES	0.0009	0.0014	0.0011	0.0012	0.0009
TRANSP.EQ.	0.0029	0.0038	0.0036	0.0038	0.0033
INSTRUMENTS	0.0019	0.002	0.0018	0.0022	0.0016
MISC. MFG.	0.0034	0.0043	0.0037	0.0036	0.0028
TRANSPORTATION	0.0542	0.0412	0.0488	0.0407	0.0456
COMMUNICATION	0.0235	0.0303	0.024	0.0269	0.0192
ELEC/GAS/WATER	0.0244	0.032	0.0274	0.0277	0.0227
WHSALE. TRADE	0.0844	0.0642	0.073	0.0761	0.0879
RETAIL TRADE	0.1163	0.1261	0.1025	0.1101	0.0768
FINANCE	0.0192	0.0269	0.0219	0.0225	0.0188
INSURANCE	0.0208	0.0315	0.0249	0.0271	0.0221
REAL ESTATE	0.1027	0.161	0.1301	0.1317	0.0995
HOT/LODG/AMUS	0.0121	0.0184	0.015	0.0153	0.0121
PERSONAL SVCS	0.0127	0.0201	0.0162	0.0163	0.0127
BUSINESS SVCS	0.0594	0.0456	0.0581	0.0562	0.0382
EAT/DRINK	0.0361	0.055	0.0454	0.0449	0.0365
HEALTH SVCS	0.0355	0.06	0.0476	0.0476	0.0357
MISC. SVCS	0.0507	0.0562	0.048	0.0474	0.041
HOUSEHOLDS	0.6473	1.0949	0.8683	0.8685	0.6514
TOTAL/1/	2.0106	2.0246	1.9658	2.0726	1.8798

APPENDIX B
OUTPUT MULTIPLIERS (Dollars)

	12.0208	12.0209	12.021	12.0211	12.0212
AGRICULTURE	0.0107	0.0113	0.0139	0.0172	0.0125
FOREST & FISH	0.0006	0.0007	0.0008	0.0007	0.0007
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0.0001	0.0001	0.0001	0.0002	0.0001
MISC.MINING	0.0129	0.019	0.0092	0.0241	0.0371
NEW CONST	0	0	0	0	0
MAINT/REP CONST	1.0192	1.021	1.0234	1.019	1.0199
FOOD/ KIND PROD	0.0343	0.0392	0.0466	0.0339	0.0343
TEX MILL PRODS	0.0005	0.0005	0.0006	0.0005	0.0005
APPAREL	0.0109	0.0102	0.0124	0.0088	0.009
PAPER PROD.	0.0066	0.0078	0.0081	0.007	0.0077
PRINT/PUB	0.0099	0.0113	0.0129	0.0106	0.0106
CHEM/PETR REFNG	0.0229	0.0439	0.0212	0.0318	0.0398
RUB/LEATH PROD.	0.0043	0.0132	0.0077	0.0068	0.0106
LUMB,WOOD/FURN.	0.0051	0.0058	0.0072	0.0183	0.0203
STONE/CLAY/GLS.	0.1061	0.0572	0.05	0.0438	0.0641
METAL INDUS.	0.0077	0.0085	0.0029	0.0103	0.0121
FAB. METAL	0.0621	0.043	0.0369	0.0641	0.0414
MACH.,NON-ELEC.	0.0043	0.0044	0.0075	0.0051	0.0093
ELEC./EQUIP.	0.005	0.0049	0.0057	0.0298	0.0225
MOTOR VEHICLES	0.0009	0.0011	0.0012	0.001	0.001
TRANSP.EQ.	0.0032	0.0034	0.0037	0.0032	0.0033
INSTRUMENTS	0.0018	0.0017	0.0019	0.002	0.0017
MISC. MFG.	0.0029	0.0037	0.004	0.0037	0.0047
TRANSPORTATION	0.0506	0.0563	0.0457	0.0643	0.06
COMMUNICATION	0.0206	0.0251	0.0479	0.0238	0.0213
ELEC/GAS/WATER	0.0236	0.027	0.0296	0.0242	0.0255
WHSALE. TRADE	0.0807	0.0729	0.073	0.0834	0.0823
RETAIL TRADE	0.0794	0.0936	0.1109	0.086	0.0911
FINANCE	0.0194	0.0211	0.0244	0.0188	0.0186
INSURANCE	0.0221	0.0242	0.0279	0.0231	0.0212
REAL ESTATE	0.1038	0.1204	0.1419	0.1052	0.1076
HOT/LODG/AMUS	0.0124	0.014	0.0164	0.0122	0.0124
PERSONAL SVCS	0.0144	0.0151	0.0177	0.0136	0.0133
BUSINESS SVCS	0.0427	0.0614	0.0586	0.0717	0.0514
EAT/DRINK	0.0406	0.0427	0.0499	0.0392	0.0384
HEALTH SVCS	0.0374	0.0437	0.0522	0.0372	0.038
MISC. SVCS	0.0381	0.0443	0.0491	0.0427	0.0476
HOUSEHOLDS	0.682	0.796	0.9526	0.6775	0.6932
TOTAL/1/	1.918	1.9737	2.0231	1.9873	1.9922

APPENDIX B
OUTPUT MULTIPLIERS (Dollars)

	12.0213	12.0214	12.0215	12.0216
AGRICULTURE	0.01	0.0137	0.0097	0.014
FOREST & FISH	0.0008	0.0008	0.0006	0.0007
COAL MINING	0	0	0	0
PETRO/NAT.GAS	0.0002	0.0002	0.0001	0.0002
MISC.MINING	0.0352	0.0626	0.0041	0.0255
NEW CONST	0	0	0	0
MAINT/REP CONST	1.021	1.0239	1.0175	1.0212
FOOD/ KIND PROD	0.0341	0.0446	0.0335	0.0355
TEX MILL PRODS	0.0005	0.0006	0.0004	0.0005
APPAREL	0.0098	0.0116	0.0088	0.0094
PAPER PROD.	0.0072	0.0083	0.0059	0.0079
PRINT/PUB	0.0105	0.0127	0.0093	0.0109
CHEM/PETR REFNG	0.0247	0.0507	0.0116	0.044
RUB/LEATH PROD.	0.0088	0.0091	0.0063	0.015
LUMB,WOOD/FURN.	0.0242	0.0113	0.0067	0.017
STONE/CLAY/GLS.	0.1146	0.0442	0.0262	0.0708
METAL INDUS.	0.0085	0.0038	0.0033	0.0102
FAB. METAL	0.0691	0.0453	0.0366	0.0695
MACH.,NON-ELEC.	0.0049	0.0029	0.0045	0.0058
ELEC./EQUIP.	0.0053	0.0092	0.0051	0.017
MOTOR VEHICLES	0.001	0.0012	0.0009	0.001
TRANSP.EQ.	0.0032	0.0036	0.0027	0.0034
INSTRUMENTS	0.0018	0.0017	0.0014	0.0017
MISC. MFG.	0.0035	0.0059	0.0028	0.0037
TRANSPORTATION	0.0607	0.0726	0.0336	0.0601
COMMUNICATION	0.0247	0.0281	0.019	0.0253
ELEC/GAS/WATER	0.0256	0.0311	0.0221	0.026
WHSALE. TRADE	0.0799	0.0677	0.0533	0.0773
RETAIL TRADE	0.0837	0.1058	0.0803	0.0936
FINANCE	0.0197	0.0242	0.0191	0.0217
INSURANCE	0.0223	0.0277	0.0212	0.0243
REAL ESTATE	0.1065	0.1387	0.1069	0.111
HOT/LODG/AMUS	0.0127	0.0161	0.0129	0.0132
PERSONAL SVCS	0.0136	0.0171	0.013	0.0138
BUSINESS SVCS	0.0659	0.0592	0.038	0.0527
EAT/DRINK	0.0385	0.0479	0.0355	0.0389
HEALTH SVCS	0.0377	0.0499	0.0376	0.0394
MISC. SVCS	0.04	0.0519	0.0386	0.0464
HOUSEHOLDS	0.687	0.9092	0.6849	0.7176
TOTAL/1/	2.0303	2.1059	1.729	2.0284

APPENDIX C
EARNINGS MULTIPLIERS (Dollars)

	61.0602	11.0101	11.0102	11.0103	11.0104
AGRICULTURE	0.0026	0.0042	0.0042	0.0039	0.004
FOREST & FISH	0.0003	0.0003	0.0003	0.0003	0.0002
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0	0	0	0	0
MISC.MINING	0.0002	0.0019	0.0019	0.0017	0.0014
NEW CONST	0	0.3182	0.336	0.3301	0.2703
MAINT/REP CONST	0.0078	0.0083	0.01	0.0093	0.009
FOOD/ KIND PROD	0.0033	0.0049	0.0051	0.005	0.0047
TEX MILL PRODS	0.0003	0.0001	0.0001	0.0001	0.0001
APPAREL	0.0022	0.0024	0.0028	0.0026	0.0028
PAPER PROD.	0.0014	0.0017	0.0018	0.0019	0.0018
PRINT/PUB	0.0028	0.0039	0.0041	0.004	0.0038
CHEM/PETR REFNG	0.0021	0.0027	0.003	0.0026	0.0019
RUB/LEATH PROD.	0.0021	0.0016	0.0022	0.0031	0.0022
LUMB,WOOD/FURN.	0.0181	0.0242	0.0217	0.0239	0.0133
STONE/CLAY/GLS.	0.0052	0.0147	0.0139	0.0126	0.0133
METAL INDUS.	0.0017	0.0009	0.0011	0.0014	0.0018
FAB. METAL	0.0198	0.0102	0.0103	0.012	0.0257
MACH.,NON-ELEC.	0.0013	0.0018	0.0021	0.0034	0.0038
ELEC./EQUIP.	0.0029	0.0036	0.0041	0.0038	0.0046
MOTOR VEHICLES	0.0006	0.0001	0.0001	0.0001	0.0002
TRANSP.EQ.	0.1901	0.0009	0.0009	0.0009	0.001
INSTRUMENTS	0.0004	0.0005	0.0006	0.0006	0.0007
MISC. MFG.	0.0007	0.0008	0.0009	0.0009	0.001
TRANSPORTATION	0.0154	0.0211	0.0213	0.0206	0.0197
COMMUNICATION	0.0048	0.0067	0.0072	0.0072	0.007
ELEC/GAS/WATER	0.002	0.0028	0.0029	0.0029	0.0027
WHSALE. TRADE	0.0398	0.0379	0.0364	0.0362	0.0329
RETAIL TRADE	0.0243	0.0694	0.0743	0.0718	0.0639
FINANCE	0.005	0.0069	0.0072	0.0067	0.0068
INSURANCE	0.0049	0.0089	0.0095	0.0094	0.0089
REAL ESTATE	0.0022	0.0034	0.0035	0.0034	0.0032
HOT/LODG/AMUS	0.0032	0.0046	0.0048	0.0047	0.0044
PERSONAL SVCS	0.0044	0.0061	0.0064	0.0063	0.0058
BUSINESS SVCS	0.0193	0.0403	0.0415	0.0376	0.0391
EAT/DRINK	0.0091	0.0119	0.0122	0.012	0.0128
HEALTH SVCS	0.0136	0.0214	0.0223	0.0219	0.0196
MISC. SVCS	0.0094	0.015	0.0156	0.0152	0.0162
HOUSEHOLDS	0.0016	0.0025	0.0026	0.0026	0.0023
TOTAL/1/	0.4249	0.6676	0.695	0.6826	0.6128

1. Each entry represents the dollar change in earnings that occurs in the row industry for each additional dollar of output delivered to final demand by the column industry.

APPENDIX C
EARNINGS MULTIPLIERS (Dollars)

	11.0105	11.0106	11.01067	11.0201	11.0202
AGRICULTURE	0.0039	0.004	0.0035	0.0038	0.0041
FOREST & FISH	0.0003	0.0002	0.0003	0.0002	0.0002
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0	0	0	0	0
MISC.MINING	0.0024	0.0025	0.0016	0.0011	0.0018
NEW CONST	0.2618	0.3225	0.349	0.3971	0.356
MAINT/REP CONST	0.0094	0.0094	0.0097	0.009	0.0093
FOOD/ KIND PROD	0.0047	0.0051	0.0052	0.0053	0.0052
TEX MILL PRODS	0.0001	0.0001	0.0001	0.0001	0.0001
APPAREL	0.0023	0.0027	0.0027	0.0027	0.0026
PAPER PROD.	0.0021	0.0017	0.0017	0.0015	0.0019
PRINT/PUB	0.0043	0.0039	0.0039	0.0038	0.0039
CHEM/PETR REFNG	0.0048	0.0023	0.0017	0.0015	0.0025
RUB/LEATH PROD.	0.0028	0.0027	0.0016	0.0013	0.0019
LUMB,WOOD/FURN.	0.028	0.0087	0.0121	0.0046	0.0087
STONE/CLAY/GLS.	0.0129	0.0206	0.0153	0.0076	0.0114
METAL INDUS.	0.0009	0.0017	0.0021	0.001	0.0014
FAB. METAL	0.0139	0.0215	0.0324	0.022	0.0245
MACH.,NON-ELEC.	0.0015	0.0036	0.0026	0.0038	0.0044
ELEC./EQUIP.	0.0044	0.005	0.0033	0.0055	0.0047
MOTOR VEHICLES	0.0001	0.0002	0.0002	0.0002	0.0002
TRANSP.EQ.	0.0009	0.001	0.001	0.0012	0.0012
INSTRUMENTS	0.0005	0.0011	0.0008	0.0008	0.0008
MISC. MFG.	0.0009	0.001	0.001	0.0009	0.0009
TRANSPORTATION	0.0213	0.02	0.0195	0.0189	0.0204
COMMUNICATION	0.0069	0.0071	0.0072	0.0069	0.0071
ELEC/GAS/WATER	0.0028	0.0028	0.0028	0.0028	0.0028
WHSALE. TRADE	0.0386	0.032	0.0308	0.03	0.0327
RETAIL TRADE	0.0801	0.0548	0.0568	0.0521	0.0531
FINANCE	0.0065	0.0072	0.0072	0.0072	0.0072
INSURANCE	0.0084	0.0093	0.0096	0.0095	0.0095
REAL ESTATE	0.0032	0.0034	0.0034	0.0034	0.0035
HOT/LODG/AMUS	0.0045	0.0049	0.005	0.0051	0.0051
PERSONAL SVCS	0.006	0.0064	0.0066	0.0066	0.0065
BUSINESS SVCS	0.0469	0.0586	0.0531	0.0537	0.0593
EAT/DRINK	0.0114	0.0128	0.0127	0.0124	0.0126
HEALTH SVCS	0.0204	0.0218	0.0227	0.0232	0.0227
MISC. SVCS	0.0148	0.0163	0.0165	0.0163	0.0168
HOUSEHOLDS	0.0024	0.0026	0.0027	0.0028	0.0027
TOTAL/1/	0.6374	0.6816	0.7089	0.7258	0.7099

APPENDIX C
EARNINGS MULTIPLIERS (Dollars)

	11.0203	11.0204	11.0205	11.0206	11.0207
AGRICULTURE	0.0039	0.0036	0.0041	0.0043	0.0044
FOREST & FISH	0.0003	0.0002	0.0002	0.0003	0.0003
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0	0	0	0	0
MISC.MINING	0.0013	0.0018	0.0022	0.0019	0.0014
NEW CONST	0.3889	0.3755	0.349	0.3872	0.3746
MAINT/REP CONST	0.0099	0.0098	0.0094	0.0099	0.0097
FOOD/ KIND PROD	0.0055	0.0055	0.0052	0.0056	0.0054
TEX MILL PRODS	0.0001	0.0001	0.0001	0.0001	0.0001
APPAREL	0.0028	0.0028	0.0027	0.0029	0.0027
PAPER PROD.	0.0015	0.0015	0.0017	0.0015	0.002
PRINT/PUB	0.0041	0.0041	0.004	0.0042	0.0041
CHEM/PETR REFNG	0.0015	0.0019	0.0026	0.0018	0.0028
RUB/LEATH PROD.	0.0021	0.0012	0.0021	0.0013	0.0023
LUMB,WOOD/FURN.	0.01	0.0074	0.0075	0.0062	0.0087
STONE/CLAY/GLS.	0.0145	0.0205	0.0139	0.0217	0.0152
METAL INDUS.	0.0017	0.0016	0.0015	0.0014	0.0015
FAB. METAL	0.0322	0.0253	0.0257	0.0182	0.0233
MACH.,NON-ELEC.	0.0024	0.0087	0.0039	0.002	0.0025
ELEC./EQUIP.	0.0086	0.0025	0.0051	0.0036	0.0062
MOTOR VEHICLES	0.0001	0.0002	0.0002	0.0001	0.0002
TRANSP.EQ.	0.0013	0.0011	0.0012	0.001	0.0012
INSTRUMENTS	0.0006	0.0005	0.001	0.0009	0.0009
MISC. MFG.	0.0009	0.0009	0.001	0.001	0.0009
TRANSPORTATION	0.0192	0.0197	0.021	0.0216	0.02
COMMUNICATION	0.0075	0.0076	0.0071	0.0077	0.0077
ELEC/GAS/WATER	0.003	0.0029	0.0029	0.003	0.0029
WHSALE. TRADE	0.0299	0.0289	0.0333	0.0304	0.0317
RETAIL TRADE	0.0569	0.0563	0.0549	0.0576	0.0544
FINANCE	0.0076	0.0075	0.0073	0.0076	0.0075
INSURANCE	0.0099	0.0099	0.0094	0.0101	0.0097
REAL ESTATE	0.0036	0.0036	0.0035	0.0037	0.0036
HOT/LODG/AMUS	0.0054	0.0053	0.0051	0.0054	0.0053
PERSONAL SVCS	0.0069	0.0069	0.0066	0.0072	0.0069
BUSINESS SVCS	0.0556	0.0635	0.0563	0.0697	0.0669
EAT/DRINK	0.0132	0.013	0.0126	0.0131	0.013
HEALTH SVCS	0.0242	0.0239	0.0226	0.0244	0.0238
MISC. SVCS	0.0171	0.0179	0.0175	0.0205	0.017
HOUSEHOLDS	0.0029	0.0028	0.0027	0.0029	0.0028
TOTAL/1/	0.7571	0.7464	0.7071	0.7618	0.7434

APPENDIX C
EARNINGS MULTIPLIERS (Dollars)

	11.0231	11.0232	11.0241	11.025	11.0301
AGRICULTURE	0.0043	0.0048	0.0043	0.0046	0.004
FOREST & FISH	0.0043	0.0003	0.0003	0.0003	0.0002
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0	0	0	0	0
MISC.MINING	0.0019	0.0016	0.0019	0.0018	0.0006
NEW CONST	0.3651	0.3864	0.3631	0.3726	0.4412
MAINT/REP CONST	0.0095	0.0097	0.0097	0.0092	0.0083
FOOD/ KIND PROD	0.0053	0.0055	0.0054	0.0054	0.0054
TEX MILL PRODS	0.0001	0.0001	0.0001	0.0001	0.0001
APPAREL	0.0027	0.0028	0.0028	0.0028	0.0027
PAPER PROD.	0.0018	0.0018	0.0017	0.0018	0.0012
PRINT/PUB	0.004	0.0042	0.0042	0.0042	0.0036
CHEM/PETR REFNG	0.0023	0.0019	0.002	0.0027	0.0018
RUB/LEATH PROD.	0.0024	0.0021	0.0019	0.002	0.0027
LUMB,WOOD/FURN.	0.0049	0.0125	0.0103	0.0087	0.0044
STONE/CLAY/GLS.	0.0158	0.017	0.0196	0.0163	0.0062
METAL INDUS.	0.0015	0.0015	0.0015	0.0014	0.0052
FAB. METAL	0.021	0.0211	0.0208	0.0182	0.0057
MACH.,NON-ELEC.	0.0046	0.0029	0.0037	0.0032	0.0011
ELEC./EQUIP.	0.0048	0.0049	0.0042	0.005	0.0044
MOTOR VEHICLES	0.0002	0.0002	0.0002	0.0002	0.0002
TRANSP.EQ.	0.0011	0.001	0.0011	0.0011	0.0009
INSTRUMENTS	0.0012	0.0008	0.0008	0.001	0.0006
MISC. MFG.	0.0009	0.001	0.0009	0.0011	0.0008
TRANSPORTATION	0.0207	0.0188	0.0194	0.02	0.0158
COMMUNICATION	0.0075	0.0074	0.0072	0.0074	0.0065
ELEC/GAS/WATER	0.0029	0.003	0.003	0.003	0.0027
WHSALE. TRADE	0.0327	0.0324	0.031	0.0319	0.0289
RETAIL TRADE	0.055	0.0607	0.0589	0.0599	0.0447
FINANCE	0.0073	0.0076	0.0075	0.0075	0.0064
INSURANCE	0.0095	0.0099	0.0098	0.0098	0.0082
REAL ESTATE	0.0035	0.0036	0.0036	0.0033	0.0035
HOT/LODG/AMUS	0.0051	0.0053	0.0053	0.0053	0.0048
PERSONAL SVCS	0.0068	0.007	0.0069	0.0071	0.0067
BUSINESS SVCS	0.0586	0.0592	0.0678	0.0662	0.0575
EAT/DRINK	0.0127	0.0131	0.0132	0.0131	0.0123
HEALTH SVCS	0.0231	0.0243	0.0237	0.0238	0.0237
MISC. SVCS	0.0177	0.018	0.0182	0.0181	0.0159
HOUSEHOLDS	0.0027	0.0029	0.0028	0.0028	0.0028
TOTAL/1/	0.7214	0.7574	0.7385	0.7427	0.7395

APPENDIX C
EARNINGS MULTIPLIERS (Dollars)

	11.0302	11.0303	11.0304	11.0305	11.0306
AGRICULTURE	0.0037	0.004	0.0039	0.0041	0.0034
FOREST & FISH	0.0003	0.0003	0.0003	0.0002	0.0003
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0	0	0	0	0
MISC.MINING	0.0042	0.0022	0.0016	0.0007	0.0017
NEW CONST	0.4319	0.4153	0.372	0.3753	0.3473
MAINT/REP CONST	0.0095	0.0098	0.0095	0.0092	0.0094
FOOD/ KIND PROD	0.0056	0.0058	0.0057	0.0055	0.0053
TEX MILL PRODS	0.0001	0.0001	0.0001	0.0001	0.0001
APPAREL	0.0028	0.0028	0.0028	0.0029	0.0026
PAPER PROD.	0.0014	0.0014	0.0013	0.0013	0.0013
PRINT/PUB	0.0038	0.0042	0.0044	0.0043	0.004
CHEM/PETR REFNG	0.001	0.0012	0.001	0.001	0.0013
RUB/LEATH PROD.	0.0018	0.0016	0.0015	0.0015	0.0016
LUMB,WOOD/FURN.	0.0095	0.0047	0.0012	0.0014	0.0012
STONE/CLAY/GLS.	0.0087	0.0115	0.0058	0.0055	0.016
METAL INDUS.	0.0017	0.0013	0.0015	0.0017	0.0046
FAB. METAL	0.0182	0.0231	0.0199	0.0148	0.0169
MACH.,NON-ELEC.	0.0017	0.0018	0.0022	0.0011	0.0017
ELEC./EQUIP.	0.0125	0.005	0.002	0.0026	0.0016
MOTOR VEHICLES	0.0002	0.0002	0.0002	0.0001	0.0002
TRANSP.EQ.	0.0012	0.0013	0.0012	0.0011	0.0012
INSTRUMENTS	0.0008	0.0008	0.0006	0.0006	0.0006
MISC. MFG.	0.001	0.0009	0.0009	0.0009	0.0008
TRANSPORTATION	0.0277	0.0199	0.0215	0.0204	0.0218
COMMUNICATION	0.0069	0.0071	0.0074	0.0072	0.0073
ELEC/GAS/WATER	0.0029	0.003	0.0029	0.0028	0.0028
WHSALE. TRADE	0.0277	0.0292	0.0278	0.0273	0.0262
RETAIL TRADE	0.0476	0.0518	0.0454	0.0442	0.0424
FINANCE	0.0076	0.0074	0.008	0.0079	0.0077
INSURANCE	0.0099	0.0095	0.0101	0.0099	0.0095
REAL ESTATE	0.0038	0.0038	0.0037	0.0037	0.0035
HOT/LODG/AMUS	0.0053	0.0056	0.0061	0.006	0.0055
PERSONAL SVCS	0.0071	0.0072	0.0073	0.0073	0.0068
BUSINESS SVCS	0.0456	0.0883	0.1335	0.1281	0.1091
EAT/DRINK	0.0129	0.0135	0.0137	0.0131	0.0125
HEALTH SVCS	0.0247	0.0253	0.0248	0.0243	0.0231
MISC. SVCS	0.0177	0.0177	0.0187	0.0184	0.0184
HOUSEHOLDS	0.0029	0.003	0.0029	0.0029	0.0027
TOTAL/1/	0.7711	0.7915	0.7735	0.7597	0.7221

APPENDIX C
EARNINGS MULTIPLIERS (Dollars)

	11.0307	11.0308	11.04	11.0501	11.0502
AGRICULTURE	0.0039	0.0039	0.0071	0.0047	0.0044
FOREST & FISH	0.0003	0.0003	0.0002	0.0003	0.0003
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0	0	0	0	0
MISC.MINING	0.0027	0.0041	0.009	0.0017	0.0018
NEW CONST	0.3567	0.3263	0.319	0.2709	0.3962
MAINT/REP CONST	0.0099	0.0101	0.0102	0.0094	0.0097
FOOD/ KIND PROD	0.0056	0.0055	0.0053	0.0048	0.0055
TEX MILL PRODS	0.0001	0.0001	0.0001	0.0001	0.0001
APPAREL	0.0028	0.0027	0.0027	0.0024	0.0028
PAPER PROD.	0.0015	0.0014	0.0014	0.0015	0.0019
PRINT/PUB	0.0044	0.0043	0.0042	0.0041	0.0041
CHEM/PETR REFNG	0.0021	0.0027	0.0078	0.0034	0.0025
RUB/LEATH PROD.	0.0012	0.001	0.0027	0.0078	0.0024
LUMB,WOOD/FURN.	0.001	0.004	0.0015	0.0321	0.0058
STONE/CLAY/GLS.	0.0235	0.0321	0.0244	0.0151	0.011
METAL INDUS.	0.0022	0.0012	0.0012	0.0009	0.0018
FAB. METAL	0.0136	0.0229	0.0188	0.0148	0.0215
MACH.,NON-ELEC.	0.0109	0.0018	0.001	0.0016	0.0011
ELEC./EQUIP.	0.0023	0.0045	0.0048	0.0024	0.0028
MOTOR VEHICLES	0.0002	0.0002	0.0002	0.0001	0.0002
TRANSP.EQ.	0.0011	0.0012	0.0011	0.0009	0.0009
INSTRUMENTS	0.0005	0.0006	0.0005	0.0004	0.0005
MISC. MFG.	0.0009	0.0011	0.0028	0.0009	0.0009
TRANSPORTATION	0.0226	0.0278	0.0297	0.0221	0.0215
COMMUNICATION	0.008	0.0077	0.0074	0.0072	0.0077
ELEC/GAS/WATER	0.003	0.003	0.003	0.0028	0.0029
WHSALE. TRADE	0.0318	0.0263	0.0284	0.0368	0.0313
RETAIL TRADE	0.0453	0.0455	0.0444	0.0766	0.0612
FINANCE	0.0081	0.008	0.0077	0.0062	0.0075
INSURANCE	0.0101	0.01	0.0096	0.0089	0.0098
REAL ESTATE	0.0038	0.0037	0.0037	0.0034	0.0036
HOT/LODG/AMUS	0.006	0.0057	0.0055	0.0046	0.005
PERSONAL SVCS	0.0072	0.0071	0.0069	0.0062	0.007
BUSINESS SVCS	0.1151	0.1079	0.1005	0.0491	0.0594
EAT/DRINK	0.0136	0.0133	0.0129	0.0116	0.0128
HEALTH SVCS	0.0246	0.0238	0.0234	0.0208	0.0241
MISC. SVCS	0.0187	0.0187	0.0188	0.0158	0.0183
HOUSEHOLDS	0.0029	0.0028	0.0028	0.0025	0.0029
TOTAL/1/	0.769	0.7431	0.7293	0.649	0.753

APPENDIX C
EARNINGS MULTIPLIERS (Dollars)

	11.0601	11.0602	11.0603	11.0701	11.0702
AGRICULTURE	0.003	0.0041	0.0035	0.0049	0.004
FOREST & FISH	0.0002	0.0003	0.0002	0.0003	0.0003
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0	0	0	0	0
MISC.MINING	0.0006	0.0002	0.0021	0.0036	0.0026
NEW CONST	0.3338	0.6013	0.4383	0.4455	0.4071
MAINT/REP CONST	0.0079	0.0089	0.009	0.0098	0.0104
FOOD/ KIND PROD	0.0046	0.0064	0.0053	0.0059	0.0062
TEX MILL PRODS	0.0001	0.0001	0.0001	0.0001	0.0001
APPAREL	0.0023	0.0033	0.0027	0.0031	0.0034
PAPER PROD.	0.001	0.0013	0.0013	0.0016	0.0014
PRINT/PUB	0.0033	0.0039	0.0034	0.0034	0.0041
CHEM/PETR REFNG	0.0013	0.0018	0.0022	0.0022	0.0024
RUB/LEATH PROD.	0.0008	0.0017	0.002	0.002	0.0016
LUMB,WOOD/FURN.	0.001	0.0017	0.0049	0.0049	0.0043
STONE/CLAY/GLS.	0.0039	0.0017	0.0237	0.0158	0.0107
METAL INDUS.	0.0022	0.0005	0.0013	0.0011	0.0007
FAB. METAL	0.0096	0.0066	0.0141	0.0139	0.0148
MACH.,NON-ELEC.	0.0015	0.0006	0.0017	0.0027	0.0011
ELEC./EQUIP.	0.0017	0.0049	0.0037	0.0089	0.0016
MOTOR VEHICLES	0.0001	0.0002	0.0001	0.0002	0.0002
TRANSP.EQ.	0.001	0.0011	0.0011	0.0013	0.0013
INSTRUMENTS	0.0004	0.0005	0.0005	0.0005	0.0005
MISC. MFG.	0.0007	0.0009	0.0009	0.0013	0.001
TRANSPORTATION	0.0297	0.0187	0.0249	0.0227	0.0272
COMMUNICATION	0.0062	0.0068	0.006	0.0068	0.0086
ELEC/GAS/WATER	0.0023	0.003	0.0026	0.003	0.0031
WHSALE. TRADE	0.0269	0.0235	0.0249	0.0284	0.0258
RETAIL TRADE	0.0365	0.0525	0.0465	0.0501	0.0516
FINANCE	0.0073	0.009	0.006	0.008	0.0079
INSURANCE	0.0222	0.0098	0.0083	0.0103	0.011
REAL ESTATE	0.0031	0.0039	0.0031	0.0037	0.0041
HOT/LODG/AMUS	0.0042	0.0051	0.0043	0.0056	0.0067
PERSONAL SVCS	0.0056	0.0077	0.0065	0.0074	0.0079
BUSINESS SVCS	0.0471	0.0278	0.0231	0.0638	0.15
EAT/DRINK	0.0109	0.0142	0.0121	0.0139	0.0147
HEALTH SVCS	0.0201	0.0283	0.0234	0.0258	0.0272
MISC. SVCS	0.0174	0.0197	0.0159	0.0199	0.0224
HOUSEHOLDS	0.0024	0.0034	0.0028	0.0031	0.0032
TOTAL/1/	0.6231	0.8855	0.7323	0.8058	0.8485

APPENDIX C
EARNINGS MULTIPLIERS (Dollars)

	11.0703	11.0704	12.01	12.0201	12.0202
AGRICULTURE	0.0041	0.0064	0.0041	0.0042	0.0045
FOREST & FISH	0.0003	0.0003	0.0003	0.0003	0.0003
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0	0	0	0	0
MISC.MINING	0.0054	0.0056	0.0021	0.0014	0.003
NEW CONST	0.3878	0.3498	0	0	0
MAINT/REP CONST	0.0107	0.0104	0.3744	0.4811	0.3596
FOOD/ KIND PROD	0.0062	0.0056	0.0051	0.0057	0.0048
TEX MILL PRODS	0.0001	0.0001	0.0001	0.0001	0.0001
APPAREL	0.0032	0.0029	0.0028	0.0028	0.0025
PAPER PROD.	0.0015	0.0015	0.002	0.0019	0.0018
PRINT/PUB	0.0049	0.0044	0.0041	0.004	0.0037
CHEM/PETR REFNG	0.0015	0.0037	0.0065	0.0032	0.0065
RUB/LEATH PROD.	0.0014	0.0014	0.0032	0.0031	0.0022
LUMB,WOOD/FURN.	0.0065	0.006	0.0078	0.0043	0.012
STONE/CLAY/GLS.	0.0133	0.0141	0.0095	0.0076	0.0119
METAL INDUS.	0.0007	0.0012	0.001	0.0009	0.0013
FAB. METAL	0.0117	0.0227	0.0175	0.0145	0.0091
MACH.,NON-ELEC.	0.001	0.0015	0.0028	0.0024	0.002
ELEC./EQUIP.	0.0015	0.0071	0.003	0.004	0.0026
MOTOR VEHICLES	0.0002	0.0002	0.0001	0.0002	0.0001
TRANSP.EQ.	0.0011	0.0012	0.0009	0.001	0.0009
INSTRUMENTS	0.0005	0.0005	0.0005	0.0006	0.0006
MISC. MFG.	0.001	0.0017	0.001	0.0009	0.0009
TRANSPORTATION	0.0275	0.0282	0.0198	0.018	0.0213
COMMUNICATION	0.0088	0.0081	0.0071	0.0074	0.006
ELEC/GAS/WATER	0.0032	0.0031	0.0029	0.003	0.0027
WHSALE. TRADE	0.0257	0.029	0.0371	0.0317	0.0349
RETAIL TRADE	0.0506	0.0491	0.0782	0.0697	0.0614
FINANCE	0.008	0.0079	0.0073	0.008	0.0075
INSURANCE	0.011	0.0102	0.0086	0.0093	0.0085
REAL ESTATE	0.0042	0.0038	0.0035	0.0036	0.0032
HOT/LODG/AMUS	0.0069	0.0059	0.0045	0.0048	0.0042
PERSONAL SVCS	0.0079	0.0072	0.0063	0.0069	0.006
BUSINESS SVCS	0.1634	0.109	0.0224	0.0218	0.0226
EAT/DRINK	0.0148	0.0135	0.0121	0.0131	0.0116
HEALTH SVCS	0.0272	0.0247	0.0224	0.0252	0.0211
MISC. SVCS	0.0219	0.0192	0.0152	0.0164	0.0143
HOUSEHOLDS	0.0032	0.0029	0.0027	0.003	0.0025
TOTAL/1/	0.8489	0.7702	0.6993	0.7864	0.6583

APPENDIX C
EARNINGS MULTIPLIERS (Dollars)

	12.0203	12.0204	12.0205	12.0206	12.0207
AGRICULTURE	0.0037	0.0263	0.0045	0.0571	0.0031
FOREST & FISH	0.0003	0.0003	0.0003	0.0003	0.0002
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0	0	0	0	0
MISC.MINING	0.0054	0.0005	0.0034	0.001	0.0037
NEW CONST	0	0	0	0	0
MAINT/REP CONST	0.3392	0.7709	0.573	0.5174	0.3885
FOOD/ KIND PROD	0.0047	0.0078	0.0063	0.0063	0.0048
TEX MILL PRODS	0.0001	0.0001	0.0001	0.0001	0.0001
APPAREL	0.0025	0.0039	0.0031	0.0031	0.0024
PAPER PROD.	0.0014	0.0016	0.0014	0.0041	0.0012
PRINT/PUB	0.0035	0.0045	0.0039	0.0039	0.0031
CHEM/PETR REFNG	0.0043	0.0017	0.0014	0.0019	0.0049
RUB/LEATH PROD.	0.0018	0.0012	0.001	0.001	0.0011
LUMB,WOOD/FURN.	0.0084	0.0029	0.0097	0.0049	0.0012
STONE/CLAY/GLS.	0.0168	0.0032	0.004	0.0052	0.0143
METAL INDUS.	0.0021	0.0009	0.0013	0.0014	0.0017
FAB. METAL	0.0157	0.0042	0.0121	0.0187	0.0193
MACH.,NON-ELEC.	0.0013	0.0007	0.0011	0.0011	0.0012
ELEC./EQUIP.	0.0055	0.0026	0.0073	0.0054	0.0027
MOTOR VEHICLES	0.0001	0.0002	0.0002	0.0002	0.0001
TRANSP.EQ.	0.0009	0.0012	0.0011	0.0012	0.0011
INSTRUMENTS	0.0006	0.0006	0.0006	0.0007	0.0005
MISC. MFG.	0.0011	0.0011	0.0009	0.0007	0.0007
TRANSPORTATION	0.0239	0.0181	0.0213	0.0179	0.0198
COMMUNICATION	0.0062	0.0081	0.0064	0.0071	0.0051
ELEC/GAS/WATER	0.0027	0.0035	0.003	0.0031	0.0025
WHSALE. TRADE	0.033	0.0251	0.0285	0.0297	0.0344
RETAIL TRADE	0.0577	0.0626	0.0509	0.0546	0.0381
FINANCE	0.0061	0.0083	0.0068	0.007	0.0059
INSURANCE	0.0075	0.0113	0.009	0.0097	0.0079
REAL ESTATE	0.0031	0.0045	0.0037	0.0038	0.0029
HOT/LODG/AMUS	0.004	0.0061	0.005	0.0051	0.004
PERSONAL SVCS	0.0059	0.0094	0.0094	0.0076	0.0077
BUSINESS SVCS	0.0262	0.0233	0.0262	0.0261	0.0188
EAT/DRINK	0.0113	0.0172	0.0142	0.014	0.0114
HEALTH SVCS	0.0207	0.035	0.0278	0.0278	0.0209
MISC. SVCS	0.0173	0.0218	0.0182	0.0181	0.0152
HOUSEHOLDS	0.0025	0.0041	0.0033	0.0033	0.0025
TOTAL/1/	0.6473	1.0949	0.8683	0.8685	0.6514

APPENDIX C
EARNINGS MULTIPLIERS (Dollars)

	12.0208	12.0209	12.021	12.0211	12.0212
AGRICULTURE	0.0038	0.0038	0.0048	0.0076	0.0048
FOREST & FISH	0.0002	0.0003	0.0003	0.0002	0.0002
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0.0037	0	0	0	0
MISC.MINING	0	0.0055	0.0027	0.007	0.0109
NEW CONST	0.4095	0	0	0	0
MAINT/REP CONST	0.005	0.5033	0.6426	0.3728	0.3933
FOOD/ KIND PROD	0.0001	0.0058	0.0069	0.005	0.0051
TEX MILL PRODS	0.0031	0.0001	0.0001	0.0001	0.0001
APPAREL	0.0013	0.0029	0.0035	0.0025	0.0025
PAPER PROD.	0.0032	0.0015	0.0015	0.0013	0.0015
PRINT/PUB	0.0031	0.0037	0.0042	0.0034	0.0034
CHEM/PETR REFNG	0.0011	0.0056	0.0029	0.0043	0.0052
RUB/LEATH PROD.	0.0012	0.0031	0.0019	0.0017	0.0026
LUMB,WOOD/FURN.	0.0237	0.0014	0.0018	0.0038	0.0045
STONE/CLAY/GLS.	0.0016	0.0151	0.0123	0.0113	0.0157
METAL INDUS.	0.0016	0.0022	0.0006	0.0021	0.0024
FAB. METAL	0.0153	0.0107	0.009	0.0164	0.0107
MACH.,NON-ELEC.	0.0013	0.0013	0.0021	0.0015	0.0025
ELEC./EQUIP.	0.0015	0.0015	0.0018	0.0112	0.008
MOTOR VEHICLES	0.0001	0.0002	0.0002	0.0002	0.0002
TRANSP.EQ.	0.001	0.0011	0.0012	0.001	0.0011
INSTRUMENTS	0.0006	0.0005	0.0006	0.0006	0.0006
MISC. MFG.	0.0008	0.001	0.001	0.001	0.0014
TRANSPORTATION	0.0217	0.0246	0.0201	0.0283	0.0264
COMMUNICATION	0.0054	0.0067	0.0127	0.0063	0.0056
ELEC/GAS/WATER	0.0026	0.003	0.0033	0.0027	0.0028
WHSALE. TRADE	0.0316	0.0285	0.0285	0.0326	0.0322
RETAIL TRADE	0.0394	0.0465	0.0551	0.0427	0.0452
FINANCE.	0.0061	0.0066	0.0076	0.0059	0.0058
INSURANCE	0.008	0.0087	0.01	0.0083	0.0076
REAL ESTATE	0.003	0.0035	0.004	0.0031	0.0032
HOT/LODG/AMUS	0.0041	0.0047	0.0054	0.0041	0.0041
PERSONAL SVCS	0.0067	0.0071	0.0083	0.0063	0.0062
BUSINESS SVCS	0.0205	0.0271	0.0271	0.0298	0.0236
EAT/DRINK	0.0127	0.0133	0.0156	0.0122	0.012
HEALTH SVCS	0.0218	0.0255	0.0305	0.0217	0.0222
MISC. SVCS	0.0145	0.0169	0.019	0.0158	0.0169
HOUSEHOLDS	0.0026	0.003	0.003	0.0036	0.0026
TOTAL/1/	0.682	0.796	0.9526	0.6775	0.6932

APPENDIX C
EARNINGS MULTIPLIERS (Dollars)

	12.0213	12.0214	12.0215	12.0216
AGRICULTURE	0.0033	0.0047	0.0032	0.0056
FOREST & FISH	0.0002	0.0003	0.0002	0.0002
COAL MINING	0	0	0	0
PETRO/NAT.GAS	0	0	0	0
MISC.MINING	0.0103	0.0183	0.0011	0.0075
NEW CONST	0	0	0	0
MAINT/REP CONST	0.3794	0.5787	0.464	0.4098
FOOD/ KIND PROD	0.005	0.0066	0.0049	0.0052
TEX MILL PRODS	0.0001	0.0001	0.0001	0.0001
APPAREL	0.0027	0.0032	0.0025	0.0026
PAPER PROD.	0.0014	0.0016	0.0011	0.0015
PRINT/PUB	0.0034	0.0041	0.003	0.0035
CHEM/PETR REFNG	0.0034	0.0061	0.0017	0.0055
RUB/LEATH PROD.	0.0022	0.0022	0.0015	0.0036
LUMB,WOOD/FURN.	0.0047	0.0026	0.0016	0.0039
STONE/CLAY/GLS.	0.0288	0.0106	0.0066	0.0175
METAL INDUS.	0.0019	0.0006	0.0006	0.0023
FAB. METAL	0.0177	0.011	0.0091	0.0169
MACH.,NON-ELEC.	0.0015	0.0009	0.0013	0.0017
ELEC./EQUIP.	0.0017	0.0031	0.0016	0.0062
MOTOR VEHICLES	0.0001	0.0002	0.0001	0.0002
TRANSP.EQ.	0.001	0.0011	0.0009	0.0011
INSTRUMENTS	0.0006	0.0005	0.0004	0.0005
MISC. MFG.	0.0009	0.0017	0.0007	0.001
TRANSPORTATION	0.0265	0.0318	0.0147	0.0262
COMMUNICATION	0.0065	0.0074	0.005	0.0067
ELEC/GAS/WATER	0.0028	0.0035	0.0025	0.0029
WHSALE. TRADE	0.0312	0.0265	0.0208	0.0302
RETAIL TRADE	0.0415	0.0525	0.0398	0.0465
FINANCE	0.0062	0.0076	0.006	0.0069
INSURANCE	0.008	0.01	0.0076	0.0088
REAL ESTATE	0.0032	0.004	0.0032	0.0033
HOT/LODG/AMUS	0.0042	0.0054	0.0043	0.0044
PERSONAL SVCS	0.0063	0.008	0.0061	0.0065
BUSINESS SVCS	0.0283	0.0271	0.0183	0.0242
EAT/DRINK	0.012	0.0149	0.0111	0.0121
HEALTH SVCS	0.022	0.0291	0.0219	0.023
MISC. SVCS	0.015	0.0195	0.0146	0.0169
HOUSEHOLDS	0.0026	0.0026	0.0026	0.0027
TOTAL/1/	0.687	0.9092	0.6849	0.7176

APPENDIX D
 EMPLOYMENT MULTIPLIERS (JOBS)

	61.0602	11.0101	11.0102	11.0103	11.0104
AGRICULTURE	0.2	0.3	0.3	0.3	0.3
FOREST & FISH	0	0	0	0	0
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0	0	0	0	0
MISC.MINING	0	0.1	0.1	0.1	0.1
NEW CONST	0	18.2	19.3	18.9	15.5
MAINT/REP CONST	0.4	0.5	0.6	0.5	0.5
FOOD/ KIND PROD	0.2	0.2	0.3	0.2	0.2
TEX MILL PRODS	0	0	0	0	0
APPAREL	0.2	0.2	0.3	0.2	0.3
PAPER PROD.	0.1	0.1	0.1	0.1	0.1
PRINT/PUB	0.2	0.2	0.2	0.2	0.2
CHEM/PETR REFNG	0.1	0.1	0.1	0.1	0.1
RUB/LEATH PROD.	0.1	0.1	0.1	0.2	0.1
LUMB,WOOD/FURN.	1.2	1.6	1.4	1.5	0.9
STONE/CLAY/GLS.	0.2	0.7	0.6	0.6	0.6
METAL INDUS.	0.1	0	0	0.1	0.1
FAB. METAL	0.9	0.5	0.5	0.6	1.2
MACH.,NON-ELEC.	0.1	0.1	0.1	0.1	0.1
ELEC./EQUIP.	0.1	0.2	0.2	0.2	0.2
MOTOR VEHICLES	0	0	0	0	0
TRANSP.EQ.	6.4	0	0	0	0
INSTRUMENTS	0	0	0	0	0
MISC. MFG.	0.1	0.1	0.1	0.1	0.1
TRANSPORTATION	0.7	0.9	0.9	0.9	0.8
COMMUNICATION	0.2	0.2	0.2	0.2	0.2
ELEC/GAS/WATER	0.1	0.1	0.1	0.1	0.1
WHSALE. TRADE	1.9	1.8	1.7	1.7	1.5
RETAIL TRADE	1.9	5.4	5.7	5.6	4.9
FINANCE	0.2	0.3	0.3	0.3	0.3
INSURANCE	0.2	0.4	0.4	0.4	0.4
REAL ESTATE	0.3	0.4	0.4	0.4	0.4
HOT/LODG/AMUS	0.3	0.5	0.5	0.5	0.4
PERSONAL SVCS	0.5	0.7	0.8	0.8	0.7
BUSINESS SVCS	1.4	2.9	3	2.7	2.8
EAT/DRINK	1.3	1.7	1.7	1.7	1.8
HEALTH SVCS	0.6	0.9	1	1	0.9
MISC. SVCS	0.5	0.8	0.9	0.8	0.9
HOUSEHOLDS	0.3	0.5	0.5	0.5	0.4
TOTAL/1/	20.9	40.8	42.5	41.7	37.4

1. Each entry represents the change in number of jobs that occurs in the row industry for each additional 1 million dollars of output delivered to final demand by the column industry.

APPENDIX D
EMPLOYMENT MULTIPLIERS (JOBS)

	11.0105	11.0106	11.01067	11.0201	11.0202
AGRICULTURE	0.3	0.3	0.3	0.3	0.3
FOREST & FISH	0	0	0	0	0
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0	0	0	0	0
MISC.MINING	0.1	0.1	0.1	0	0.1
NEW CONST	15	18.5	20	22.8	20.4
MAINT/REP CONST	0.5	0.5	0.6	0.5	0.5
FOOD/ KIND PROD	0.2	0.3	0.3	0.3	0.3
TEX MILL PRODS	0	0	0	0	0
APPAREL	0.2	0.3	0.3	0.2	0.2
PAPER PROD.	0.1	0.1	0.1	0.1	0.1
PRINT/PUB	0.2	0.2	0.2	0.2	0.2
CHEM/PETR REFNG	0.2	0.1	0.1	0.1	0.1
RUB/LEATH PROD.	0.2	0.2	0.1	0.1	0.1
LUMB,WOOD/FURN.	1.8	0.6	0.8	0.3	0.6
STONE/CLAY/GLS.	0.6	1	0.7	0.4	0.5
METAL INDUS.	0	0.1	0.1	0	0.1
FAB. METAL	0.7	1	1.5	1	1.2
MACH.,NON-ELEC.	0.1	0.1	0.1	0.1	0.2
ELEC./EQUIP.	0.2	0.2	0.1	0.2	0.2
MOTOR VEHICLES	0	0	0	0	0
TRANSP.EQ.	0	0	0	0	0
INSTRUMENTS	0	0.1	0	0	0
MISC. MFG.	0.1	0.1	0.1	0.1	0.1
TRANSPORTATION	0.9	0.9	0.8	0.8	0.9
COMMUNICATION	0.2	0.2	0.2	0.2	0.2
ELEC/GAS/WATER	0.1	0.1	0.1	0.1	0.1
WHSALE. TRADE	1.8	1.5	1.4	1.4	1.5
RETAIL TRADE	6.2	4.2	4.4	4	4.1
FINANCE	0.3	0.3	0.3	0.3	0.3
INSURANCE	0.4	0.4	0.4	0.4	0.4
REAL ESTATE	0.4	0.4	0.4	0.4	0.4
HOT/LODG/AMUS	0.5	0.5	0.5	0.5	0.5
PERSONAL SVCS	0.7	0.8	0.8	0.8	0.8
BUSINESS SVCS	3.4	4.2	3.8	3.8	4.2
EAT/DRINK	1.6	1.8	1.8	1.8	1.8
HEALTH SVCS	0.9	1	1	1	1
MISC. SVCS	0.8	0.9	0.9	0.9	0.9
HOUSEHOLDS	0.5	0.5	0.5	0.5	0.5
TOTAL/1/	39.3	41.4	43	44	43.1

APPENDIX D
EMPLOYMENT MULTIPLIERS (JOBS)

	11.0203	11.0204	11.0205	11.0206	11.0207
AGRICULTURE	0.3	0.3	0.3	0.4	0.4
FOREST & FISH	0	0	0	0	0
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0	0	0	0	0
MISC.MINING	0.1	0.1	0.1	0.1	0.1
NEW CONST	22.3	21.5	20	22.2	21.5
MAINT/REP CONST	0.6	0.6	0.5	0.6	0.6
FOOD/ KIND PROD	0.3	0.3	0.3	0.3	0.3
TEX MILL PRODS	0	0	0	0	0
APPAREL	0.3	0.3	0.2	0.3	0.3
PAPER PROD.	0.1	0.1	0.1	0.1	0.1
PRINT/PUB	0.2	0.2	0.2	0.2	0.2
CHEM/PETR REFNG	0.1	0.1	0.1	0.1	0.1
RUB/LEATH PROD.	0.1	0.1	0.1	0.1	0.1
LUMB,WOOD/FURN.	0.6	0.5	0.5	0.4	0.6
STONE/CLAY/GLS.	0.7	0.1	0.6	1	0.7
METAL INDUS.	0.1	0.1	0.1	0.1	0.1
FAB. METAL	1.5	1.2	1.2	0.9	1.1
MACH.,NON-ELEC.	0.1	0.3	0.2	0.1	0.1
ELEC./EQUIP.	0.4	0.1	0.2	0.2	0.3
MOTOR VEHICLES	0	0	0	0	0
TRANSP.EQ.	0	0	0	0	0
INSTRUMENTS	0	0	0	0	0
MISC. MFG.	0.1	0.1	0.1	0.1	0.1
TRANSPORTATION	0.8	0.9	0.9	0.9	0.9
COMMUNICATION	0.2	0.2	0.2	0.2	0.2
ELEC/GAS/WATER	0.1	0.1	0.1	0.1	0.1
WHSALE. TRADE	1.4	1.4	1.6	1.4	1.5
RETAIL TRADE	4.4	4.4	4.2	4.5	4.2
FINANCE	0.3	0.3	0.3	0.4	0.3
INSURANCE	0.5	0.5	0.4	0.5	0.5
REAL ESTATE	0.4	0.4	0.4	0.4	0.4
HOT/LODG/AMUS	0.6	0.5	0.5	0.6	0.5
PERSONAL SVCS	0.8	0.8	0.8	0.9	0.8
BUSINESS SVCS	4	4.5	4	5	4.8
EAT/DRINK	1.9	1.9	1.8	1.9	1.9
HEALTH SVCS	1.1	1.1	1	1.1	1.1
MISC. SVCS	0.9	1	0.9	1.1	0.9
HOUSEHOLDS	0.5	0.5	0.5	0.5	0.5
TOTAL/1/	45.8	45.2	42.8	46.4	45.2

APPENDIX D
EMPLOYMENT MULTIPLIERS (JOBS)

	11.0231	11.0232	11.0241	11.025	11.0301
AGRICULTURE	0.4	0.4	0.4	0.4	0.3
FOREST & FISH	0	0	0	0	0
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0	0	0	0	0
MISC.MINING	0.1	0.1	0.1	0.1	0
NEW CONST	20.9	22.2	20.8	21.4	25.3
MAINT/REP CONST	0.5	0.6	0.6	0.5	0.5
FOOD/ KIND PROD	0.3	0.3	0.3	0.3	0.3
TEX MILL PRODS	0	0	0	0	0
APPAREL	0.3	0.3	0.3	0.3	0.2
PAPER PROD.	0.1	0.1	0.1	0.1	0
PRINT/PUB	0.2	0.2	0.2	0.2	0.2
CHEM/PETR REFNG	0.1	0.1	0.1	0.1	0.1
RUB/LEATH PROD.	0.2	0.1	0.1	0.1	0.1
LUMB,WOOD/FURN.	0.3	0.8	0.7	0.6	0.3
STONE/CLAY/GLS.	0.7	0.8	0.9	0.8	0.3
METAL INDUS.	0.1	0.1	0.1	0.1	0.2
FAB. METAL	1	1	1	0.9	0.3
MACH.,NON-ELEC.	0.2	0.1	0.1	0.1	0.1
ELEC./EQUIP.	0.2	0.2	0.2	0.2	0.2
MOTOR VEHICLES	0	0	0	0	0
TRANSP.EQ.	0	0	0	0	0
INSTRUMENTS	0.1	0	0	0.1	0
MISC. MFG.	0.1	0.1	0.1	0.1	0.1
TRANSPORTATION	0.9	0.8	0.8	0.9	0.7
COMMUNICATION	0.2	0.2	0.2	0.2	0.2
ELEC/GAS/WATER	0.1	0.1	0.1	0.1	0.1
WHSALE. TRADE	1.5	1.5	1.5	1.5	1.4
RETAIL TRADE	4.3	4.7	4.6	4.6	3.5
FINANCE	0.3	0.3	0.3	0.3	0.3
INSURANCE	0.4	0.5	0.5	0.5	0.4
REAL ESTATE	0.4	0.4	0.4	0.4	0.4
HOT/LODG/AMUS	0.5	0.5	0.5	0.5	0.5
PERSONAL SVCS	0.8	0.9	0.9	0.9	0.8
BUSINESS SVCS	4.2	4.2	4.9	4.7	4.1
EAT/DRINK	1.8	1.9	1.9	1.9	1.8
HEALTH SVCS	1	1.1	1	1	1
MISC. SVCS	1	1	1	1	0.9
HOUSEHOLDS	0.5	0.5	0.5	0.5	0.5
TOTAL/1/	43.7	46.1	45.1	45.3	44.9

APPENDIX D
EMPLOYMENT MULTIPLIERS (JOBS)

	11.0302	11.0303	11.0304	11.0305	11.0306
AGRICULTURE	0.3	0.3	0.3	0.3	0.3
FOREST & FISH	0	0	0	0	0
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0	0	0	0	0
MISC.MINING	0.2	0.1	0.1	0	0.1
NEW CONST	24.8	23.8	21.3	21.5	19.9
MAINT/REP CONST	0.5	0.6	0.5	0.5	0.5
FOOD/ KIND PROD	0.3	0.3	0.3	0.3	0.3
TEX MILL PRODS	0	0	0	0	0
APPAREL	0.3	0.3	0.3	0.3	0.2
PAPER PROD.	0.1	0.1	0	0	0
PRINT/PUB	0.2	0.2	0.2	0.2	0.2
CHEM/PETR REFNG	0.1	0.1	0.1	0.1	0
RUB/LEATH PROD.	0.1	0.1	0.1	0.1	0.1
LUMB,WOOD/FURN.	0.6	0.3	0.1	0.1	0.1
STONE/CLAY/GLS.	0.4	0.5	0.3	0.3	0.7
METAL INDUS.	0.1	0.1	0.1	0.1	0.2
FAB. METAL	0.9	1.1	0.9	0.7	0.8
MACH.,NON-ELEC.	0	0.1	0.1	0	0.1
ELEC./EQUIP.	0.5	0.2	0.1	0.1	0.1
MOTOR VEHICLES	0	0	0	0	0
TRANSP.EQ.	0	0	0	0	0
INSTRUMENTS	0	0	0	0	0
MISC. MFG.	0.1	0.1	0.1	0.1	0.1
TRANSPORTATION	1.2	0.9	0.9	0.9	0.9
COMMUNICATION	0.2	0.2	0.2	0.2	0.2
ELEC/GAS/WATER	0.1	0.1	0.1	0.1	0.1
WHSALE. TRADE	1.3	1.4	1.3	1.3	1.2
RETAIL TRADE	3.7	4	3.5	3.4	3.3
FINANCE	0.4	0.3	0.4	0.4	0.4
INSURANCE	0.5	0.4	0.5	0.5	0.4
REAL ESTATE	0.4	0.4	0.4	0.4	0.4
HOT/LODG/AMUS	0.5	0.6	0.6	0.6	0.6
PERSONAL SVCS	0.9	0.9	0.9	0.9	0.8
BUSINESS SVCS	3.3	6.3	9.6	9.2	7.8
EAT/DRINK	1.8	1.9	2	1.9	1.8
HEALTH SVCS	1.1	1.1	1.1	1.1	1
MISC. SVCS	1	1	1	1	1
HOUSEHOLDS	0.6	0.6	0.6	0.5	0.5
TOTAL/1/	46.3	48.4	48	47.2	44.4

APPENDIX D
EMPLOYMENT MULTIPLIERS (JOBS)

	11.0307	11.0308	11.04	11.0501	11.0502
AGRICULTURE	0.3	0.3	0.6	0.4	0.4
FOREST & FISH	0	0	0	0	0
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0	0	0	0	0
MISC.MINING	0.1	0.2	0.4	0.1	0.1
NEW CONST	20.5	18.7	18.3	15.5	22.7
MAINT/REP CONST	0.6	0.6	0.6	0.5	0.6
FOOD/ KIND PROD	0.3	0.3	0.3	0.2	0.3
TEX MILL PRODS	0	0	0	0	0
APPAREL	0.3	0.2	0.2	0.2	0.3
PAPER PROD.	0.1	0.1	0.1	0.1	0.1
PRINT/PUB	0.2	0.2	0.2	0.2	0.2
CHEM/PETR REFNG	0.1	0.1	0.3	0.1	0.1
RUB/LEATH PROD.	0.1	0.1	0.1	0.1	0.2
LUMB,WOOD/FURN.	0.1	0.3	0.1	2.1	0.4
STONE/CLAY/GLS.	1.1	1.5	1.1	0.7	0.5
METAL INDUS.	0.1	0	0	0	0.1
FAB. METAL	0.6	1.1	0.9	0.7	1
MACH.,NON-ELEC.	0.4	0.1	0	0.1	0
ELEC./EQUIP.	0.1	0.2	0.2	0.1	0.1
MOTOR VEHICLES	0	0	0	0	0
TRANSP.EQ.	0	0	0	0	0
INSTRUMENTS	0	0	0	0	0
MISC. MFG.	0.1	0.1	0.2	0.1	0.1
TRANSPORTATION	1	1.2	1.3	1	0.9
COMMUNICATION	0.3	0.2	0.2	0.2	0.2
ELEC/GAS/WATER	0.1	0.1	0.1	0.1	0.1
WHSALE. TRADE	1.5	1.2	1.3	1.7	1.5
RETAIL TRADE	3.5	3.5	3.4	5.9	4.7
FINANCE	0.4	0.4	0.4	0.3	0.3
INSURANCE	0.5	0.5	0.5	0.4	0.5
REAL ESTATE	0.4	0.4	0.4	0.4	0.4
HOT/LODG/AMUS	0.6	0.6	0.6	0.5	0.5
PERSONAL SVCS	0.9	0.9	0.8	0.8	0.9
BUSINESS SVCS	8.2	7.7	7.2	3.2	4.3
EAT/DRINK	2	1.9	1.9	1.7	1.8
HEALTH SVCS	1.1	1.1	1	0.9	1.1
MISC. SVCS	1	1	1	0.9	1
HOUSEHOLDS	0.5	0.5	0.5	0.5	0.5
TOTAL/1/	47	45.3	44.4	40	45.8

APPENDIX D
EMPLOYMENT MULTIPLIERS (JOBS)

	11.0601	11.0602	11.0603	11.0701	11.0702
AGRICULTURE	0.2	0.3	0.4	0.4	0.3
FOREST & FISH	0	0	0	0	0
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0	0	0	0	0
MISC.MINING	0	0	0.1	0.2	0.1
NEW CONST	19.1	34.5	25.1	25.5	23.2
MAINT/REP CONST	0.5	0.5	0.5	0.6	0.6
FOOD/ KIND PROD	0.2	0.3	0.3	0.3	0.3
TEX MILL PRODS	0	0	0.3	0.3	0.3
APPAREL	0.2	0.3	0.3	0.3	0.3
PAPER PROD.	0	0	0	0.1	0.1
PRINT/PUB	0.2	0.2	0.2	0.2	0.3
CHEM/PETR REFNG	0	0.1	0.1	0.1	0.1
RUB/LEATH PROD.	0.1	0.1	0.1	0.1	0.1
LUMB,WOOD/FURN.	0.1	0.1	0.3	0.3	0.1
STONE/CLAY/GLS.	0.2	0.1	1.1	0.7	0.5
METAL INDUS.	0.1	0	0.1	0	0
FAB. METAL	0.5	0.3	0.7	0.7	0.7
MACH.,NON-ELEC.	0.1	0	0.1	0.1	0
ELEC./EQUIP.	0.1	0.2	0.2	0.4	0.1
MOTOR VEHICLES	0	0	0	0	0
TRANSP.EQ.	0	0	0	0	0
INSTRUMENTS	0	0	0	0	0
MISC. MFG.	0.1	0.1	0.1	0.1	0.1
TRANSPORTATION	1.3	0.8	1.1	1	1.2
COMMUNICATION	0.2	0.2	0.2	0.2	0.3
ELEC/GAS/WATER	0.1	0.1	0.1	0.1	0.1
WHSALE. TRADE	1.3	1.1	1.2	1.3	1.2
RETAIL TRADE	2.8	4.1	3.6	3.9	4
FINANCE	0.3	0.4	0.3	0.4	0.4
INSURANCE	1	0.5	0.4	0.5	0.5
REAL ESTATE	0.4	0.5	0.4	0.4	0.5
HOT/LODG/AMUS	0.4	0.5	0.4	0.6	0.7
PERSONAL SVCS	0.7	0.9	0.8	0.9	1
BUSINESS SVCS	3.4	2	1.7	4.6	10.7
EAT/DRINK	1.6	2	1.7	2	2.1
HEALTH SVCS	0.9	1.3	1	1.1	1.2
MISC. SVCS	0.9	1.1	0.9	1.1	1.2
HOUSEHOLDS	0.4	0.6	0.5	0.6	0.6
TOTAL/1/	37.4	53.4	43.7	48.8	52.8

APPENDIX D
EMPLOYMENT MULTIPLIERS (JOBS)

	11.0703	11.0704	12.01	12.0201	12.0202
AGRICULTURE	0.3	0.5	0.3	0.3	0.4
FOREST & FISH	0	0	0	0	0
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0	0	0	0	0
MISC.MINING	0.2	0.2	0.1	0.1	0.1
NEW CONST	22.2	20.1	0	0	0
MAINT/REP CONST	0.6	0.6	21.5	27.6	20.6
FOOD/ KIND PROD	0.3	0.3	0.3	0.3	0.2
TEX MILL PRODS	0.3	0.3	0.3	0.3	0
APPAREL	0.3	0.3	0.3	0.3	0.2
PAPER PROD.	0.1	0.1	0.1	0.1	0.1
PRINT/PUB	0.3	0.2	0.2	0.2	0.2
CHEM/PETR REFNG	0.1	0.1	0.2	0.1	0.2
RUB/LEATH PROD.	0.1	0.1	0.2	0.2	0.1
LUMB,WOOD/FURN.	0.4	0.4	0.5	0.3	0.8
STONE/CLAY/GLS.	0.6	0.7	0.4	0.4	0.6
METAL INDUS.	0	0	0	0	0.1
FAB. METAL	0.6	1.1	0.8	0.7	0.4
MACH.,NON-ELEC.	0	0.1	0.1	0.1	0.1
ELEC./EQUIP.	0.1	0.3	0.1	0.2	0.1
MOTOR VEHICLES	0	0	0	0	0
TRANSP.EQ.	0	0	0	0	0
INSTRUMENTS	0	0	0	0	0
MISC. MFG.	0.1	0.1	0.1	0.1	0.1
TRANSPORTATION	1.2	1.2	0.9	0.8	0.9
COMMUNICATION	0.3	0.3	0.2	0.2	0.2
ELEC/GAS/WATER	0.1	0.1	0.1	0.1	0.1
WHSALE. TRADE	1.2	1.4	1.7	1.5	1.6
RETAIL TRADE	3.9	3.8	6	5.4	4.7
FINANCE	0.4	0.4	0.3	0.4	0.3
INSURANCE	0.5	0.5	0.4	0.4	0.4
REAL ESTATE	0.5	0.4	0.4	0.4	0.4
HOT/LODG/AMUS	0.7	0.6	0.5	0.5	0.4
PERSONAL SVCS	1	0.9	0.8	0.9	0.7
BUSINESS SVCS	11.7	7.8	1.6	1.6	1.6
EAT/DRINK	2.1	1.9	1.7	1.9	1.7
HEALTH SVCS	1.2	1.1	1	1.1	0.9
MISC. SVCS	1.2	1	0.8	0.9	0.8
HOUSEHOLDS	0.6	0.5	0.5	0.6	0.5
TOTAL/1/	53	47.2	42.4	47.5	39.8

APPENDIX D
EMPLOYMENT MULTIPLIERS (JOBS)

	12.0203	12.0204	12.0205	12.0206	12.0207
AGRICULTURE	0.3	2.2	0.4	4.7	0.3
FOREST & FISH	0	0	0	0	0
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0	0	0	0	0
MISC.MINING	0.2	0	0.1	0	0.2
NEW CONST	0	0	0	0	0
MAINT/REP CONST	19.4	44.2	32.9	29.7	22.3
FOOD/ KIND PROD	0.2	0.4	0.3	0.3	0.2
TEX MILL PRODS	0	0	0	0	0
APPAREL	0.2	0.4	0.3	0.3	0.2
PAPER PROD.	0.1	0.1	0.1	0.1	0
PRINT/PUB	0.2	0.3	0.2	0.2	0.2
CHEM/PETR REFNG	0.2	0.1	0.1	0.1	0.2
RUB/LEATH PROD.	0.1	0.1	0.1	0.1	0.1
LUMB, WOOD/FURN.	0.5	0.2	0.6	0.3	0.1
STONE/CLAY/GLS.	0.8	0.1	0.2	0.2	0.7
METAL INDUS.	0.1	0	0.1	0.1	0.1
FAB. METAL	0.7	0.2	0.6	0.9	0.9
MACH., NON-ELEC.	0	0	0	0	0
ELEC./EQUIP.	0.2	0.1	0.3	0.2	0.1
MOTOR VEHICLES	0	0	0	0	0
TRANSP.EQ.	0	0	0	0	0
INSTRUMENTS	0	0	0	0	0
MISC. MFG.	0.1	0.1	0.1	0.1	0.1
TRANSPORTATION	1	0.8	0.9	0.8	0.9
COMMUNICATION	0.2	0.3	0.2	0.2	0.2
ELEC/GAS/WATER	0.1	0.1	0.1	0.1	0.1
WHSALE. TRADE	1.6	1.2	1.3	1.4	1.6
RETAIL TRADE	4.5	4.8	3.9	4.2	2.9
FINANCE	0.3	0.4	0.3	0.3	0.3
INSURANCE	0.5	0.4	0.4	0.5	0.4
REAL ESTATE	0.4	0.5	0.4	0.4	0.3
HOT/LODG/AMUS	0.4	0.6	0.5	0.5	0.4
PERSONAL SVCS	0.7	1.2	0.9	0.9	0.7
BUSINESS SVCS	1.9	1.7	1.9	1.9	1.3
EAT/DRINK	1.6	2.5	2	2	1.6
HEALTH SVCS	0.9	1.5	1.2	1.2	0.9
MISC. SVCS	0.9	1.2	1	1	1.8
HOUSEHOLDS	0.5	0.8	0.6	0.6	0.5
TOTAL/1/	38.9	66.6	52.2	53.5	38.6

APPENDIX D
EMPLOYMENT MULTIPLIERS (JOBS)

	12.0208	12.0209	12.021	12.0211	12.0212
AGRICULTURE	0.3	0.3	0.4	0.6	0.4
FOREST & FISH	0	0	0	0	0
COAL MINING	0	0	0	0	0
PETRO/NAT.GAS	0	0	0	0	0
MISC.MINING	0.2	0.2	0.1	0.3	0.5
NEW CONST	0	0	0	0	0
MAINT/REP CONST	23.5	28.9	36.8	21.4	22.6
FOOD/ KIND PROD	0.3	0.3	0.3	0.2	0.3
TEX MILL PRODS	0	0	0	0	0
APPAREL	0.3	0.3	0.3	0.2	0.2
PAPER PROD.	0.1	0	0.1	0	0.1
PRINT/PUB	0.2	0.2	0.2	0.2	0.2
CHEM/PETR REFNG	0.1	0.2	0.1	0.2	0.2
RUB/LEATH PROD.	0.1	0.2	0.1	0.2	0.1
LUMB,WOOD/FURN.	0.1	0.1	0.1	0.2	0.3
STONE/CLAY/GLS.	1.1	0.7	0.6	0.5	0.7
METAL INDUS.	0.1	0.1	0	0.1	0.1
FAB. METAL	0.3	0.5	0.4	0.8	0.5
MACH.,NON-ELEC.	0.1	0.1	0.1	0.1	0.1
ELEC./EQUIP.	0.1	0.1	0.1	0.5	0.3
MOTOR VEHICLES	0	0	0	0	0
TRANSP.EQ.	0	0	0	0	0
INSTRUMENTS	0	0	0	0	0
MISC. MFG.	0.1	0.1	0.1	0.1	0.1
TRANSPORTATION	0.9	1.1	0.9	1.2	1.1
COMMUNICATION	0.2	0.2	0.4	0.2	0.2
ELEC/GAS/WATER	0.1	0.1	0.1	0.1	0.1
WHSALE. TRADE	1.5	1.3	1.3	1.5	1.5
RETAIL TRADE	3	3.6	4.3	3.3	3.5
FINANCE	0.3	0.3	0.4	0.3	0.3
INSURANCE	0.4	0.4	0.5	0.4	0.4
REAL ESTATE	0.4	0.4	0.5	0.4	0.4
HOT/LODG/AMUS	0.4	0.5	0.6	0.4	0.4
PERSONAL SVCS	0.8	0.9	1	0.8	0.8
BUSINESS SVCS	1.5	1.9	1.9	2.1	1.7
EAT/DRINK	1.8	1.9	2.2	1.8	1.7
HEALTH SVCS	1	1.1	1.3	1	1
MISC. SVCS	0.8	0.9	1	0.9	0.9
HOUSEHOLDS	0.5	0.6	0.7	0.5	0.5
TOTAL/1/	40.7	47.5	57.1	40.4	41.2

APPENDIX D
EMPLOYMENT MULTIPLIERS (JOBS)

	12.0213	12.0214	12.0215	12.0216
AGRICULTURE	0.3	0.4	0.3	0.5
FOREST & FISH	0	0	0	0
COAL MINING	0	0	0	0
PETRO/NAT.GAS	0	0	0	0
MISC.MINING	0.4	0.8	0	0.3
NEW CONST	0	0	0	0
MAINT/REP CONST	21.8	33.2	26.6	23.5
FOOD/ KIND PROD	0.3	0.3	0.2	0.3
TEX MILL PRODS	0	0	0	0
APPAREL	0.3	0.3	0.2	0.2
PAPER PROD.	0.1	0.1	0	0.1
PRINT/PUB	0.2	0.2	0.2	0.2
CHEM/PETR REFNG	0.1	0.2	0.1	0.2
RUB/LEATH PROD.	0.1	0.1	0.1	0.2
LUMB,WOOD/FURN.	0.3	0.2	0.1	0.2
STONE/CLAY/GLS.	1.3	0.5	0.3	0.8
METAL INDUS.	0.1	0	0	0.1
FAB. METAL	0.8	0.5	0.4	0.8
MACH.,NON-ELEC.	0.1	0	0.1	0.1
ELEC./EQUIP.	0.1	0.1	0.1	0.3
MOTOR VEHICLES	0	0	0	0
TRANSP.EQ.	0	0	0	0
INSTRUMENTS	0	0	0	0
MISC. MFG.	0.1	0.1	0.1	0.1
TRANSPORTATION	1.1	1.4	0.6	1.1
COMMUNICATION	0.2	0.2	0.2	0.2
ELEC/GAS/WATER	0.1	0.1	0.1	0.1
WHSALE. TRADE	1.5	1.2	1	1.4
RETAIL TRADE	3.2	4.1	3.1	3.6
FINANCE	0.3	0.4	0.3	0.3
INSURANCE	0.4	0.5	0.4	0.4
REAL ESTATE	0.4	0.5	0.4	0.4
HOT/LODG/AMUS	0.4	0.6	0.4	0.5
PERSONAL SVCS	0.8	1	0.7	0.8
BUSINESS SVCS	2	1.9	1.3	1.7
EAT/DRINK	1.7	2.1	1.6	1.7
HEALTH SVCS	1	1.3	1	1
MISC. SVCS	0.8	1.1	0.8	0.9
HOUSEHOLDS	0.5	0.6	0.5	0.5
TOTAL/1/	40.7	54.2	41.2	42.7