FISCAL FOCUS

MICHIGAN ECONOMIC AND INDUSTRIAL TRENDS

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November 1998

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November 1998

TO: The Members of the House of Representatives

The condition of the State economy always will drive state governmental finances and affect legislative fiscal decisions. This **Fiscal Focus** reviews Michigan's recent economic and industrial trends, comparing these to other states, regions, and the nation. It also examines the likely impact of these trends on state tax collections, should there be a national recession in the future.

The report finds that Michigan's economy has significantly evolved over the last 20 years. Though our economy remains sensitive to economic cycles and still is driven by pro-cyclical industries, Michigan's industrial mix has become more diversified with increasing employment and output developing in nonmanufacturing sectors. Michigan's economic make-up is now closer to the national mean than it was two decades ago, and, as a result, the state's economy probably is less volatile and less sensitive to national economic cycles.

Because of these economic and industrial changes, it also is anticipated that there will be less fluctuation in state personal income during future economic downturns. Because personal income is an important determinant of state tax revenues, it is also expected that state tax revenue volatility will not be as drastic as 20 years ago. On the other hand, it is also probable that state revenues will grow more slowly during economic expansions.

"Michigan Economic and Industrial Trends" was prepared by Stephan Marasco, Economist, and Mitchell E. Bean, Senior Economist. Kyle Jen, a graduate student intern with HFA, assisted with the research; Jeanne Dee, Administrative Assistant for Data and Publications, formatted the report for publication. Associate Directors Bill Fairgrieve, Hank Prince, and Al Valenzio assisted me in reviewing and editing the report.

Please call should you have questions on the report.

James J. Haag
Director

TABLE OF CONTENTS

TABLES

Number

FIGURES

INTRODUCTION

Michigan's economy is closely linked to the U.S. economy and the business cycle. Historically, national recessions have been felt much more acutely in Michigan than in most other states, primarily because Michigan's industries were concentrated in highly volatile industrial sectors. Both employment and output tended to decline more severely in Michigan than in the nation as a whole, and this had adverse consequences for state personal income and tax revenues. However, Michigan's economy has changed significantly over the past two decades.

This **Fiscal Focus** explains these changes and considers the following questions: How have Michigan's industrial and employment bases changed in the last two decades? How are Michigan's tax collections likely to be affected by the next national recession?

These questions are important to state policymakers because, historically, national recessions significantly affect state revenue collections. During the twin recessions of 1980 and 1981-82, after the impacts of numerous temporary income tax increases and inflation[1] are netted out, state General Fund/General Purpose (GF/GP) tax revenues were:

- 8.7% lower in fiscal year (FY)1981 than they were in FY1980,
- 16.5% lower in FY1982 than they were in FY1980, and
- 17.3% lower in FY1983 than they were in FY1980.

Adjusted GF/GP tax revenues did not recover to FY1980 levels until FY1985. During the 1990-91 recession, GF/GP tax revenues declined 3.2%.

To put the potential impact of a recession on state revenues into perspective, consider the following:

- ***If*** FY 1999-00 state budget expenditures were to be based on an expected tax revenue increase of 4.8% (average GF/GP plus School Aid Fund growth rate for FY 1996 to FY 1999), and

[1] Because inflation in the early 1980s was increasing at a double-digit rate, any reasonable comparison must adjust for inflation.

- ***if***, at the same time, an unexpected recession were to lead to a 3.2% decline in state tax revenues (as it did in the last recession),

- ***then*** expenditures would have to be reduced (or revenues increased) 8.0%.

In this example, the negative impact on GF/GP and School Aid Fund (SAF) revenues would exceed $1.4 billion — about $400 million more than currently available in the state's "Rainy Day Fund."

To consider the questions posed, this **Fiscal Focus** will outline recent changes to Michigan's industrial base and the corresponding effects of these changes on the state's employment and output levels. It will also examine the impact these changes are likely to have on personal income and state tax revenues during the next recession.

In this publication, data computations have been made based on the following sources and methodology.

- Revision of annual gross state product by industry, as recently released by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA), is used to compare state and national real output performance. The revision includes calendar years 1977 to 1996. Prior years were not revised because of data constraints, thus real output for years before 1977 is not examined in depth.[2]

- Unless otherwise noted, all real output figures are reported in constant, chain-weighted dollars to account for inflation.

- Employment behavior is analyzed using both BEA and Michigan Employment Service Agency (MESA)[3] data from years 1969 to 1996. Other data were derived from a variety of sources; those sources are noted where appropriate.

[2] Gross state product estimates for 1997 are not yet available.

[3] As of February 1998, Michigan Employment Security Agency was changed to Michigan Employment Service Agency.

EXECUTIVE SUMMARY

Important findings and conclusions about recent changes to Michigan's industrial base, the corresponding effects of these changes on the state's employment and output levels, and the likely impact of these changes on personal income and state tax revenues during the next recession may be summarized as follows:

Employment

- Although still sensitive to variations in the national economy, state employment appears to have become less volatile and less sensitive to national economic fluctuations.

- Employment has shifted from manufacturing toward services and trade. Manufacturing accounted for roughly 33.0% of total employment in 1969 and 28.0% in 1977; today it accounts for less than 19.0%.

- As of 1996, Michigan had lost approximately 29.0% of its 1977 motor vehicle manufacturing workforce, or more than 185,000 workers. This represents almost 76.0% of the employment loss in the entire manufacturing sector during that time span.[4]

- Composition of employment within the manufacturing sector has shifted from durable goods manufacturing toward nondurable goods manufacturing.

- New employment opportunities are concentrated among smaller firms, particularly in the manufacturing sector.

- The health care industry has overtaken the motor vehicle manufacturing industry as the largest single private contributor to the state's employment base.[5]

- Labor productivity has increased in the manufacturing sector and decreased in the services sector.

[4] Only direct employment included. See note 15.
[5] Only direct employment included. See note 15.

Real Output

- State real output remains pro-cyclical[6] and sensitive to national economic fluctuations.

- The value of real output[7] between 1977 and 1996 increased more slowly in Michigan than in most other regions of the U.S. Between 1977 and 1996, Michigan's real output grew by 32.0%, whereas U.S. real output grew 65.8%.

- Real output growth in Michigan continues to be more volatile than it is in other regions.

- The manufacturing portion of total state real output has fallen from 32.5% in 1977 to roughly 28.5% in 1996.

- The shift from manufacturing output toward nonmanufacturing output has occurred to a much lesser degree than has the shift from manufacturing employment to nonmanufacturing employment.

- Real output in the motor vehicle manufacturing industry in Michigan declined 39.5% between 1977 and 1996.[8]

- The proportion of total U.S. automobiles built in Michigan declined from over 35.0% in 1982 to 25.0% in 1996.

- Light trucks continue to fuel growth in the motor vehicle manufacturing industry, and vehicle production in Michigan (historically geared to car production) has experienced an increase in production of light trucks.

Personal Income

- The average annual growth rate of state wages has declined over the last 20 years in nominal (not adjusted for inflation) dollars, most likely in response to the shift from manufacturing employment toward service-oriented jobs and to the decrease in the average size of firms.

- Average growth rates in real wages and salaries (adjusted for inflation) have remained fairly constant over time.[9]

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[6] Pro-cyclical refers to the fact that Michigan's economy expands in advance of a national economic expansion and contracts in advance of a national economic contraction.

[7] Real output is adjusted for inflation. Nominal output is not adjusted for inflation.

[8] See note 15.

[9] Real wage growth has benefitted from the low inflation Michigan has experienced since the mid-1980s.

- Historically, state personal income growth is robust during an expansion and slows dramatically when Michigan's economy slows and precedes the nation into recession. However, Michigan personal income growth has been among the slowest in the nation since 1995,[10] despite consistently low unemployment rates, robust light vehicle sales, and no recession. This phenomenon suggests that structural changes which have occurred in Michigan's employment base will lead to slower personal income growth during national economic expansions and, thus, slower state revenue growth.

- The volatility of wage and salary growth rates, both real and nominal, has declined along with the decline in employment volatility.

Tax Revenues

- Income tax revenues may be less sensitive to future economic downturns because the jobs base is becoming more diversified.

- The shift from higher paying manufacturing jobs to jobs in the service sector is likely to slow growth in personal income and income tax revenue.

- Sales and use tax and other consumption tax revenues are directly related to personal income. Less variability in personal income will lead to less variability in consumption tax revenues; slower personal income growth will lead to slower growth in consumption tax revenue.

- Approximately 70% of the single business tax base is compensation (wages, benefits, etc.), which is directly related to personal income. If compensation growth slows, single business tax revenues will slow as well.

- Because personal income growth is the single most important determinant of state tax revenue growth, if personal income growth slows, tax revenue will also grow more slowly.

[10] Bureau of Economic Analysis.

INDUSTRIAL SECTORS AND TRENDS

Overview

Economists usually divide economies into several hierarchical groupings. The largest grouping is called a sector, and this can be decomposed further into subsectors. All developed economies such as Michigan's are composed of several major sectors (e.g., manufacturing, services, retail trade, wholesale trade, and government).[11] Sectors or subsectors, in turn, comprise a multitude of industries, with each industry made up of many firms (**Figure 1**).[12]

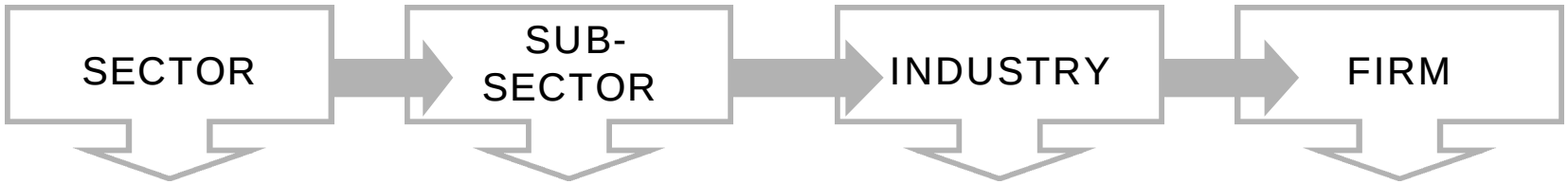
Much of the responsibility for Michigan's past sensitivity to the business cycle can be attributed to the state's concentration in and dependence upon only a few core industries — most notably the motor vehicle manufacturing industry. For example, in 1977 the motor vehicle manufacturing industry alone contributed roughly 17.0% to Michigan's total state real output; 32.0% of domestic automobiles produced were produced in Michigan. In contrast, the motor vehicle manufacturing industry comprised, on average, only 1.6% of other industrial states' real output and only 1.1% of total U.S. real output.[13]

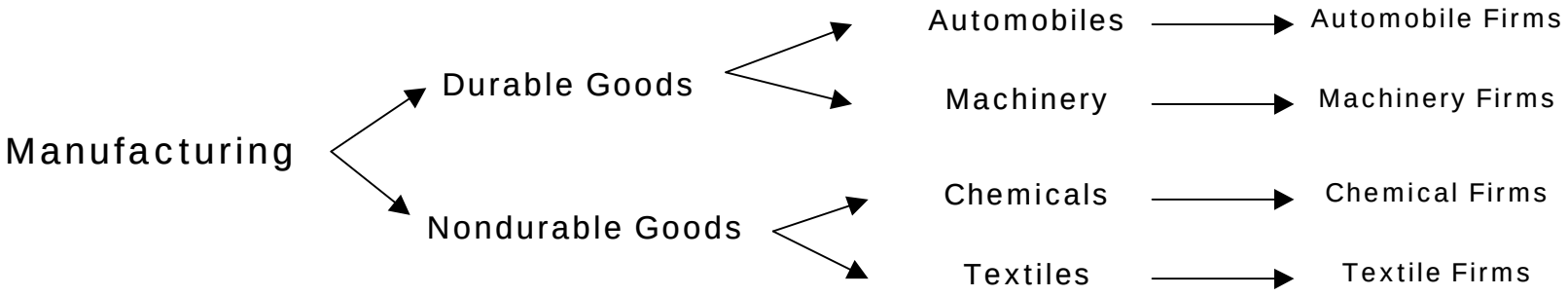
The Michigan motor vehicle manufacturing industry has not maintained its real output levels. It currently accounts for only about 8.5% of state real output, and just 25.0% of domestically-produced automobiles.[14]

[11] Other sectors include mining, construction, agriculture, and one sector encompassing finance, insurance, and real estate (FIRE).
[12] Economists sometimes also distinguish between farm and nonfarm sectors.
[13] States include California, Illinois, Indiana, New Jersey, New York, North Carolina, Ohio, Pennsylvania, and Texas. These states together accounted for approximately 53% of total U.S. GSP.
[14] Based on 1996 figures.

Figure 1

Michigan Economy





OTHER SECTORS:

FIRE *(Finance, Insurance, Real Estate)*, Services,
Wholesale Trade, Retail Trade, Construction,
Agriculture, Mining, Transportation, Public Government

There is no doubt that Michigan's dependency on employment in the motor vehicle manufacturing industry has declined over the years. Of the nearly 60,000 Michigan wage and salary jobs lost in 1991, about 19.0% of them could be directly attributable to the motor vehicle manufacturing industry. In the 1980s recessions, about 27.0% of the declines in employment in Michigan came directly from the motor vehicle manufacturing industry.[15]

The same phenomenon occurring in the motor vehicle manufacturing industry is occurring in Michigan's manufacturing sector as a whole. In 1977, the manufacturing and service sectors together accounted for nearly half of all employment and real output in Michigan. As of 1996, their combined share had decreased only slightly (to 48.0% and 46.0%, respectively), but manufacturing accounted for 32.5% of total state real output in 1977, whereas today that figure has declined to about 28.5%.[16] In contrast, the service sector has increased its share of Michigan real output from 15.0% in 1977 to about 17.7% in 1996. The manufacturing sector has lost almost 12.1% of its workforce, while the service sector gained nearly 95.0%.

The excess labor from the manufacturing sector appears to have been absorbed by the services, wholesale trade, and retail trade sectors, and to a lesser degree, the FIRE (Finance, Insurance, Real Estate) sector. The net effect of all of this on Michigan has been a gradual shift of employment away from manufacturing industries toward retail trade, wholesale trade, and — especially — service industries.[17]

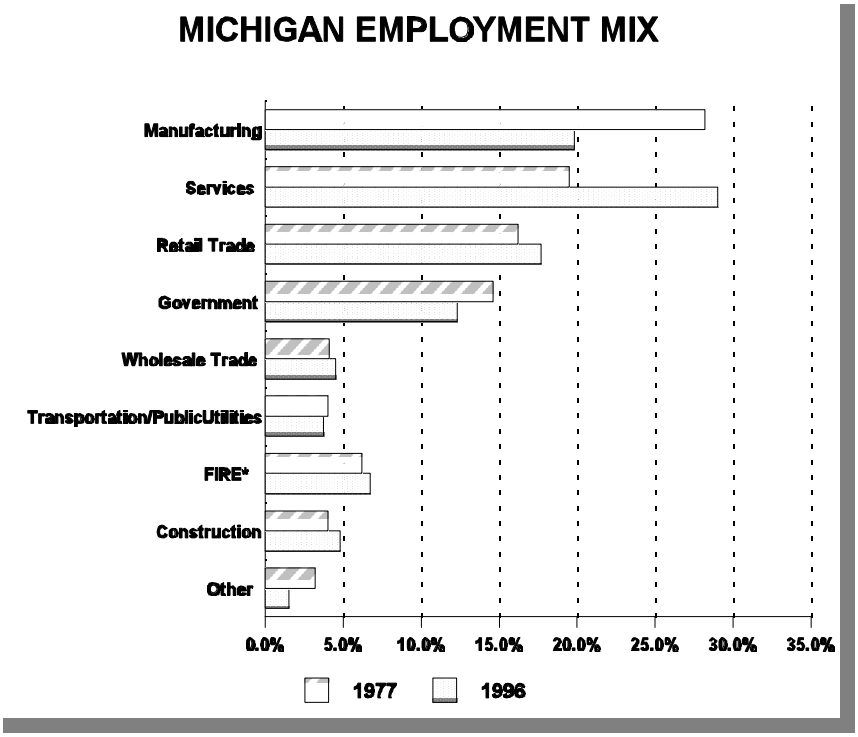
The shift of employment toward services means that service industries now employ more workers than manufacturing industries (29.0% of total employment compared to just under 19.0% for manufacturing (**Figure 2**). The mix of real output has also shifted toward services, but to a much lesser degree (**Figure 3**).

[15] Motor vehicle manufacturing industry is defined in accordance with the 1987 Standard Industrial Code (SIC) number 51371. This definition of the motor vehicle industry omits many industries in the wholesale trade sector that support or are supported by the motor vehicle manufacturing industry.

[16] The share of real output attributed to manufacturing has also declined in other industrial states (see note 14), from 24% to 18%, and in the U.S. as a whole, from 20% to 18%.

[17] Even if every employee in the business services industry were included instead in manufacturing, there would still be a noticeable shift in employment intensity toward nonmanufacturing industries (see note 18).

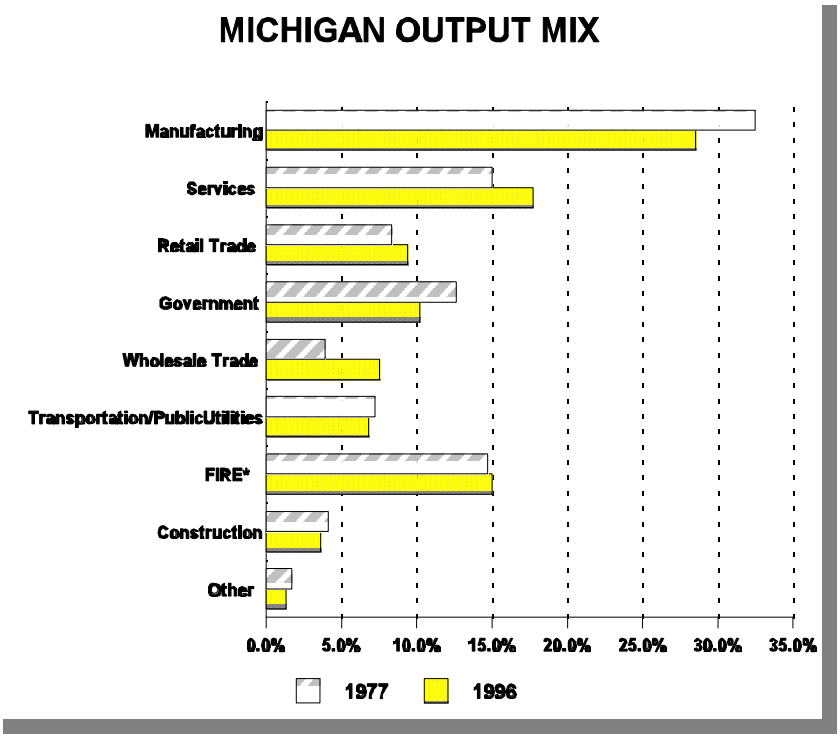
Figure 2



TOTAL LABOR FORCE
1977: 3.5 million workers
1996: 4.3 million workers

*Finance, Insurance, Real Estate

Figure 3



TOTAL OUTPUT
1977: $183 billion
1996: $241 billion

*Finance, Insurance, Real Estate

Table 1 shows the ten industries in Michigan with the largest employment gains over the past five years. Note that the service sector accounts for six of the ten fastest employment growth industries in Michigan.

Table 1

TOP TEN MICHIGAN INDUSTRIES RANKED BY NUMERICAL JOB GROWTH
From 1991 to 1996

Industry	***Job Growth***	***1996 Average Annual Employee Earnings***
Business Services	86,287	$20,607
Health Services	49,665	$29,028
Special Trade Contractors	40,606	$22,056
Eating and Drinking Places	30,889	*$9,661
Engineering and Management Services	24,587	$30,083
Social Services	23,645	$15,679
Motor Vehicles and Equipment (Manufacturing)	22,861	$63,629
Fabricated Metal Products	16,763	$39,046
Rubber and Miscellaneous Plastics Products	15,969	$30,054
Industrial Machinery and Equipment	14,471	$42,764

Source: Bureau of Economic Analysis. **Does not include earnings from gratuities.*

Michigan has experienced a somewhat higher average growth rate in real output than in employment over the past two decades. In 1977, Michigan employed approximately 3.5 million wage and salary workers and produced approximately $183 billion in real output. By 1996, these numbers had risen to 4.3 million (a 22.9% increase) and $241 billion (a 31.7% increase), respectively — an average increase of about 1.3% per year for employment and 1.7% for real output. This implies moderate productivity gains, primarily concentrated in the state's manufacturing sector.

Tables 2 and 3 show percentage changes in employment and real output for various sectors. Note that while all sectors have contributed to real output growth, employment growth has been concentrated in nonmanufacturing industries. These tables highlight the volatile nature of Michigan economic output, and of the manufacturing sector in particular. To the extent that the share of real output is shifted toward

nonmanufacturing sectors, the volatility of state real output, like that of employment (**Figure 4**), could begin to diminish. However, this effect is likely to be moderate, considering the limited impact that the output shifts Michigan has already experienced have had on real output volatility.

Table 2

MICHIGAN EMPLOYMENT: PERCENT CHANGE

		Manufacturing							
Period	**Total Wage & Salary	Durable	Motor Vehicle	Non-durable	Total	Services	Wholesale Trade	Retail Trade	FIRE
1969-72 (x1.67)*	1.5%	-16.5%	-12.5%	-9.4%	-15.2%	18.0%	14.1%	8.1%	15.0%
1972-77	9.1%	4.1%	3.8%	3.6%	4.0%	20.0%	-0.4%	13.5%	12.5%
1977-82	-6.1%	-24.6%	-27.1%	-12.3%	-22.2%	13.2%	-2.9%	0.7%	-1.2%
1982-87	16.6%	10.1%	10.0%	14.8%	11.2%	28.1%	26.3%	17.9%	24.3%
1987-92	5.9%	-9.6%	-13.5%	5.6%	-6.1%	16.4%	9.7%	9.9%	2.3%
1992-96 (x1.25)*	13.1%	11.0%	6.4%	7.9%	10.2%	19.5%	8.7%	12.5%	16.5%
1969-96	***41.0%***	***-23.4%***	***-29.9%***	***10.4%***	***-16.9%***	***159.5%***	***55.5%***	***70.7%***	***74.4%***

*Numbers in these periods adjusted to be consistent with a five-year span.
**Includes government sector.

Source: Bureau of Economic Analysis

Table 3

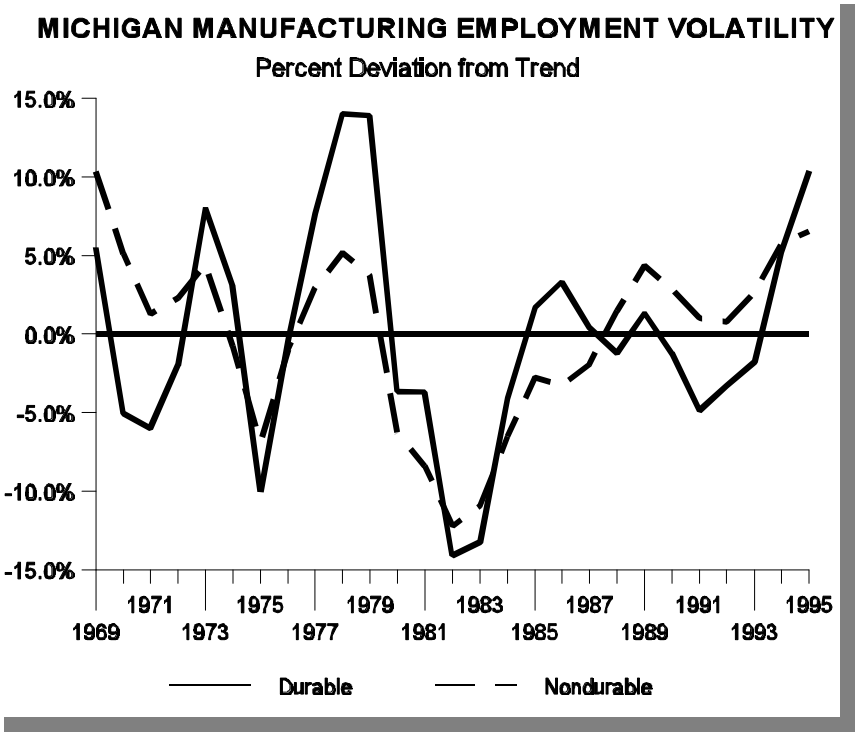
MICHIGAN REAL OUTPUT: PERCENT CHANGE

		Manufacturing							
Period	**Total	Durable	Motor Vehicle	Non-durable	Total	Services	Wholesale Trade	Retail Trade	FIRE
1977-82	-13.3%	-31.6%	-40.2%	-8.1%	-27.7%	1.9%	3.6%	-10.7%	4.6%
1982-87	24.7%	37.7%	32.9%	42.7%	38.8%	23.0%	44.0%	27.5%	3.6%
1987-92	2.1%	20.0%	-42.4%	-15.1%	-11.9%	6.9%	28.4%	3.9%	11.2%
1992-96 (x 1.25)*	24.4%	12.7%	40.3%	49.1%	38.3%	19.9%	38.6%	33.4%	14.6%
1977-96	***32.0%***	***5.0%***	***-39.5%***	***66.2%***	***15.4%***	***55.3%***	***150.6%***	***50.0%***	***34.6%***

* Numbers in this period adjusted to be consistent with a five-year span.
**Includes government sector.

Source: Bureau of Economic Analysis

Figure 4



Since the recession of 1990-91, every major private sector, including manufacturing, has added to its workforce, and real output has grown even faster than before the recession.

- Private real output grew an average of 6.9% per year between 1991 and 1996, and private employment growth averaged 2.6%. In contrast, the 1980s expansion saw private real output growth average less than 4.8% per year, while employment growth averaged 3.6% per year.

- The growth rate of total employment reached 3.1% in 1995 before returning to 1.9% in 1996. This translates into an increase of approximately 163,000 total wage and salary employees between December of 1994 and the end of 1996. On the other hand, real output annual growth has slowed in the past two years, from a post-recession high of 8.4% in 1994 to 2.6% in both 1995 and 1996.

Following is a more detailed examination of several industrial sectors in Michigan that have contributed to structural changes in the state economy.

Manufacturing

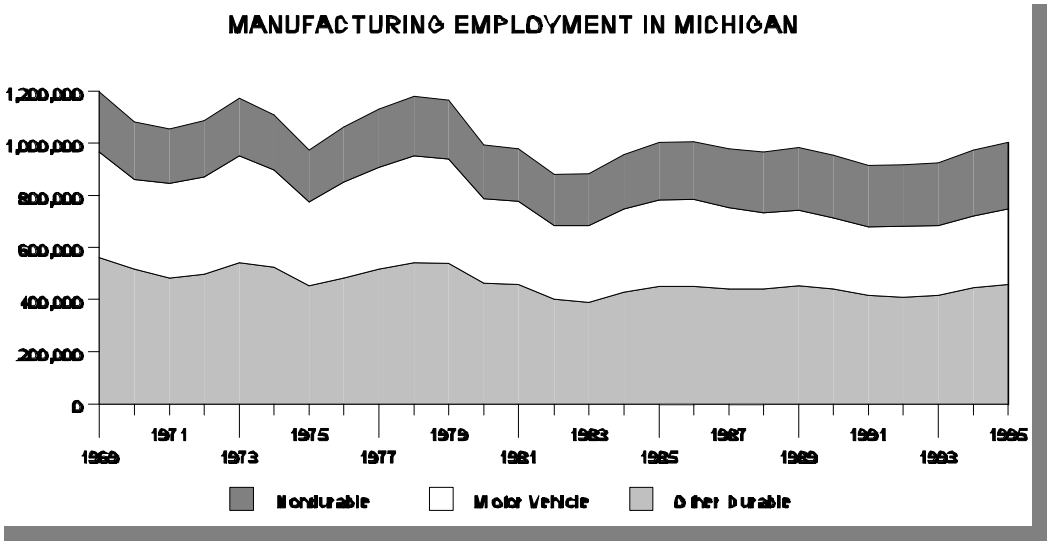
The manufacturing sector comprises two primary subsectors: durable goods manufacturing, and nondurable goods manufacturing. Durable goods include automobiles, appliances, electronics, and generally any goods that are consumed over a period of time longer than one year. Nondurable goods include goods such as textiles, food, chemicals, and generally goods that are consumed in a shorter period of time.

Over the last twenty years, the manufacturing sector in Michigan has been the object of much interest. Two major reasons for this interest are:

- ***A significant increase in productivity in Michigan in the manufacturing sector:*** Productivity is measured by output per worker. Average real output per worker per year increased 31.4% from 1977 to 1996.[18]

- ***Large employment losses in the manufacturing sector:*** Between 1969 and 1996, employment in the manufacturing sector (**Figure 5**) declined by almost 17%. This represents over 200,000 fewer jobs.

Figure 5



Source: Bureau of Economic Analysis *Recession Periods: 1980, 1981-82, 1990-91*

[18] These figures may be overstated because there is an inherent bias in the statistics that tends to exaggerate real output in the manufacturing sector. This will lead to distortions in the measured gains in productivity and real output per employee. This bias stems from the increasingly popular practice of outsourcing (subcontracting), which results in various jobs once performed by full-time employees of manufacturing firms being contracted out to business services firms which provide knowledge, labor, etc. Employees of these business services firms are categorized (correctly) as being employed in the services sector. However, the value of the labor these workers produce is subsumed (unavoidably) into the measure of manufacturing real output. The number of individuals in the business services industry (upwards of 230,000 as of 1994) that contribute directly to the manufacturing sector (the same phenomenon is occurring in other sectors) is unknown, but according to MESA, about half of business services employment is composed of this type of outsourcing employment.

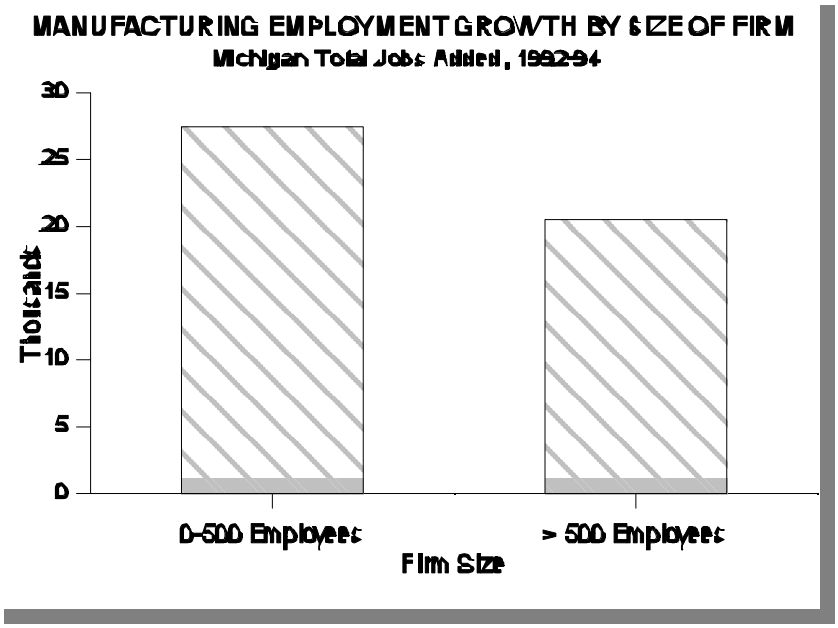
Although real output in manufacturing has fallen only moderately, employment in this sector has declined steadily since 1977, and productivity has increased. These changes in Michigan's manufacturing sector result from several factors:

- Increased competition in many industries has put pressure on firms to reduce labor costs.[19]

- High research and development (R&D) expenditures (relative to other sectors) have led to an increase in manufacturing technology; this has allowed firms to produce more efficiently and with fewer workers.[20]

- There has been a substitution of capital investment (machines and equipment) for labor employment.[21]

Figure 6



Source: Bureau of the Census, Major Industry Data

These factors have fostered an increase in the average capital-to-labor ratio in the manufacturing sector.[22] Each worker has increased his or her productivity, and, as a result, the firms have been able to produce more with fewer workers.

Although overall manufacturing employment has declined, most of the job losses occurred in large firms. Partially offsetting this trend was employment growth among small manufacturing firms. **Figure 6** shows the increases in total manufacturing employment by firm size between 1992 and 1994.

[19] The primary example of this is the ascension of foreign competition in the automobile market. The U.S. Department of Census (1996b) reports that manufacturing industries, as a whole, are becoming less concentrated and more competitive.

[20] Bureau of Labor Statistics (1992). The Bureau of the Census (1995) finds a large increase in manufacturing productivity in Michigan.

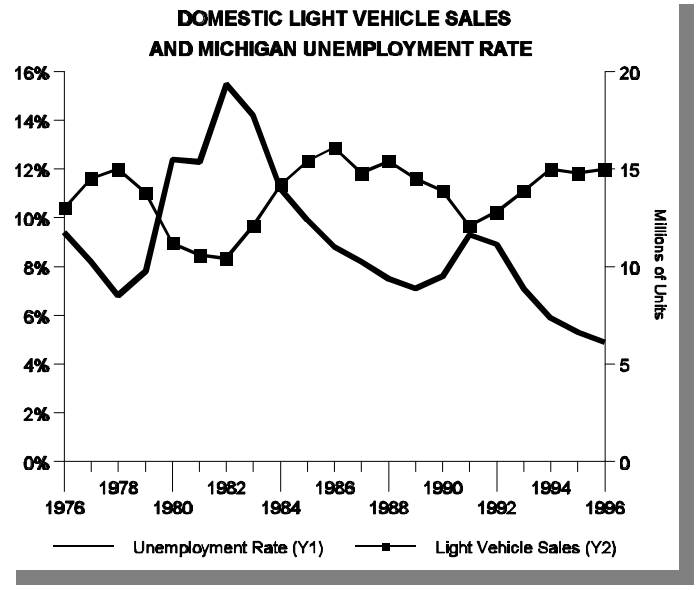
[21] This is possibly encouraged by relatively high wages and union activity in the manufacturing sector. According to the 1995 National Data Book, as of 1994, 33.2% of the manufacturing workforce in Michigan were unionized, compared to just 23.8% of workers as a whole. See Census of Manufactures (1995) for wage and capital expenditures information.

[22] The capital-to-labor ratio is the amount of capital employed relative to the amount of labor employed in the industry.

Durable Goods and the Auto Industry

Although various durable goods are manufactured in Michigan, motor vehicle manufacturing continues to be a major economic force, and state employment continues to be linked to the health of the motor vehicle industry. **Figure 7** shows the Michigan unemployment rate and U.S. light motor vehicle sales (in units) from 1976 to 1996. Light vehicle sales are clearly linked to the business cycle. As the unemployment rate falls, light vehicle sales increase and vice versa.

Figure 7



Recession Periods: 1980, 1981-82, 1990-91

Much of the loss of employment in the manufacturing sector comes from the motor vehicle industry. As of 1996, Michigan had lost approximately 29.0% of its 1977 motor vehicle workforce, or more than 105,000 workers. This represents almost 76.0% of the employment loss in the durable and nondurable goods manufacturing sectors during that time span.

Moreover, in contrast to other manufacturing industries, the motor vehicle industry in Michigan has not maintained its level of real output. Real output in motor vehicle manufacturing in Michigan fell 39.5% between 1977 and 1996.[23]

Since the last recession, the motor vehicle industry in Michigan has added jobs to its payroll. Despite this, Michigan's share of domestic motor vehicle production has continued to fall.[24] **Table 4** shows light vehicle production in Michigan and the U.S., and **Table 9** (page 36) shows U.S. light vehicle sales from 1976 to 1997. Items of interest include:

[23] Because of this loss of real output, the divergence between employment and real output trends that define the structural shift in Michigan's manufacturing sector would be even more evident if the motor vehicle manufacturing industry was not included.

[24] Data from Michigan Employment Service Agency (MESA) indicate that from early 1996 through the first half of 1997, employment in the motor vehicle manufacturing industry has begun to decline. Although this is a negative employment effect, Michigan is harmed less by this than another state might be because the corporate headquarters of all three domestic automobile manufacturers are located in Michigan.

- The popularity of light trucks and sport utility vehicles has led to an increase in the utilization rates in factories that produce these vehicles.[25]

- The proportion of U.S. light trucks built in Michigan is much lower than the proportion of cars, but that appears to be changing. As of 1996, Michigan had increased its production of light trucks by 77.6% over its 1991 level.[26]

- The proportion of total U.S. automobiles built in Michigan has declined from over 35% in 1982 to 25% in 1996.

Table 4 also illustrates that Michigan's share of automobile and truck production, as a percent of total U.S. production, has been declining. However, in recent years this trend may have begun to reverse itself. In particular, production of light trucks in Michigan is increasing.

Table 4

LIGHT VEHICLE PRODUCTION IN MICHIGAN

Motor Vehicle Manufacturing Industry, 1996

	Cars	*Light Trucks*	*Total*
Total Michigan Production	1,852,787	1,029,947	2,882,734
(% change from 1991)	*17.8%*	*77.6%*	*34.2%*
Total Michigan Capacity	2,336,542	1,158,272	3,494,814
Average Capacity Utilization Rate	*79.3%*	*88.9%*	*82.5%*
Total U.S. Production	6,055,939	5,488,187	11,544,126

Michigan Share of Total U.S. Light Vehicle Production

	Cars	*Light Trucks*	*Total*
1996	30.6%	18.8%	25.4%
1991	28.8%	18.6%	25.0%
1986	33.5%	24.2%	30.8%
1982	36.5%	33.3%	35.7%

Sources: "Automotive News Market Data Book," various issues, and American Automobile Manufacturers Association.

[25] Utilization rates refer to the percentage being used of total productive capacity in a factory.

[26] An argument can be made that a state automotive production mix more closely resembling the demand for cars and light trucks will better utilize the state's productive capacity and thus help reduce any job losses resulting from unused production capabilities and/or plant closings during a recession.

Nondurable Goods

The loss of employment in the motor vehicle industry has contributed to another trend in the manufacturing sector: In 1977, 19.7% of manufacturing workers were employed in nondurable goods production; by 1996, this number had risen to 25.7%. This is due primarily to employment increases in printing and rubber and in plastics.

Contrary to employment trends in durable goods production, nondurable goods industries have added nearly 29,000 employees since 1977. However, the increase has been gradual, and it has not kept pace with nonmanufacturing industries. Like the manufacturing sector as a whole, therefore, the nondurable goods producing industries' share of the *total* wage and salary workforce in Michigan has declined.

The share of real output in the manufacturing sector has also shifted toward nondurable goods. Moreover, nondurable goods industries experienced an increase in productivity and real output per worker. Although workers in durable goods industries are more highly paid relative to those in nondurable goods industries, a possible positive side effect of this gradual shift away from durable goods is that it may help cushion the impact of a recession.

Durable goods industries are affected early and severely in a typical recession, because durable goods (such as automobiles) is one of the first product groups that people stop buying. In contrast, demand for nondurable goods is typically not as severely affected in a recession. Consequently, nondurable goods producing industries usually fare better in a recession.

To illustrate, consider the four largest nondurable goods industries in Michigan in terms of employment (rubber and plastics, printing and publishing, food, and chemicals), which together account for almost 80% of nondurable goods employment in Michigan. **Table 5** shows that in the previous recession, the average national real output for these goods decreased by less than 1%. This contributed to only a slight loss of aggregate employment or real output in these industries in Michigan.

In comparison, the three largest durable goods employers in Michigan (motor vehicles, industrial machinery, and fabricated metals), accounting for more than 80.0% of durable goods employment in the state, experienced a combined average decline in national real output of approximately 14.0%. This contributed to a 9.0% average decline in employment in Michigan and a 16.0% average decline in real output.

Table 5

BEHAVIOR OF MICHIGAN'S LARGEST MANUFACTURING INDUSTRIES IN PREVIOUS RECESSION

Manufacturing Subsector	*Combined Average Decline in National Output leading up to 1991-92 Recession*	*Average Change during recession of Michigan: Output*	*Average Change during recession of Michigan: Employment*
Nondurable[a]	less than 1%	0.5%	-0.8%
Durable[b]	-14%	-16%	-9%

a. *Rubber and plastics, printing and publishing, food, and chemicals (which comprise 80% of total nondurable goods manufacturing industries)*
b. *Motor vehicles, industrial machinery, and fabricated metals (which comprise 80% of total durable goods manufacturing industries)*

Nondurable goods manufacturing is less responsive to national economic fluctuations, so shifting Michigan's manufacturing focus away from durable goods should help alleviate the impact of a national recession on the state's employment and income levels. On the other hand, overall wage and income growth may slow because wages and salaries are lower in the nondurable goods producing sector.

According to the Michigan Employment Service Agency (1991), a heavy manufacturing base need not portend a severe loss of employment during recessions. Many regions in Michigan are highly concentrated in manufacturing, but have avoided heavy job losses because of a presence in high growth industries and/or a balanced manufacturing base that limited losses from any single industry. The lesson here is that an industrial base with a large manufacturing component does not automatically lead to employment volatility.

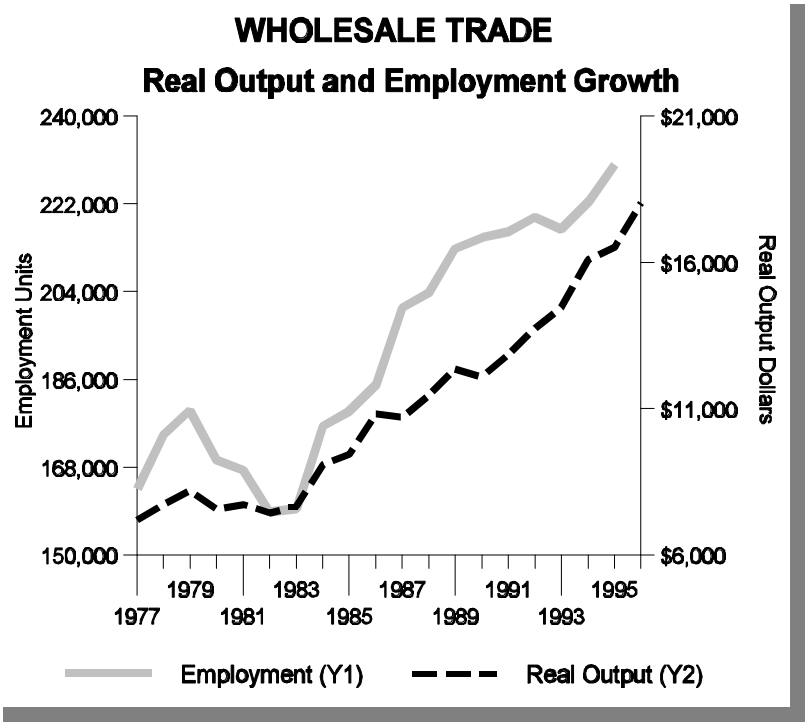
Since the recession of 1990-91, Michigan has benefitted from rapid economic growth. The manufacturing sector increased its workforce each year from 1992 to 1995, before falling back again in 1996. Those industries adding to their workforce included industrial machinery and computers, motor vehicles, and nondurable goods. Over the same period, durable goods industries added more employees than nondurable industries, reversing the previous trend. This has not been sustained, however, as the loss in 1996 is due (again) almost entirely to durable goods industries, specifically the motor vehicle industry. This reflects the inherent volatility of employment in durable goods industries.

Wholesale Trade

The wholesale trade sector consists of industries that buy and sell goods in large quantities — often at a discounted price. Wholesale trade, although less central to the Michigan economy than manufacturing, also has increased its real output much more quickly than its workforce. Real output in this sector increased a remarkable 150.6% between 1977 and 1996, and employment increased a respectable 43.9%. This has contributed to an increase of over 70.0% in the average amount of real output produced by each worker.[27]

The emergence of wholesale trade in Michigan bodes well for the state economy because compared to manufacturing, wholesale trade tends to be less sensitive to national economic fluctuations, particularly in recent years. During the 1981-82 recession, for example, when Michigan wholesale trade employment decreased significantly, real output in the wholesale trade sector decreased only moderately in Michigan and in the U.S. as a whole.

Figure 8



Source: Bureau of Economic Analysis.

Recession Periods: 1980, 1981-82, 1990-91

In the 1990-91 recession, Michigan wholesale trade real output again decreased only slightly and employment scarcely declined at all (**Figure 8**). This occurred despite the fact that durable goods comprised approximately two-thirds of wholesale trading in the state.

The likely explanation for this behavior is that in the recession of 1981-82, wholesale trade real output did not decrease significantly because the industry simply built up a large inventory backlog. Failure to sell the inventory, combined with high interest rates, resulted in massive layoffs.

[27] Like manufacturing, wholesale trade productivity gains most likely are magnified by outsourcing and other measurement problems (see note 18).

With the advent of just-in-time (JUT) supply systems in the 1980s, huge inventory build-ups were avoided in the 1990-91 recession. Moreover, real output failed to decline in the 1990-91 recession because higher exports offset the lower domestic demand and, because of JUT, there were few non-essential employees in the wholesale trade industry. Thus, massive layoffs did not occur. These changes also make it less likely that massive layoffs will occur in the next recession.

The verdict on real output volatility is still open. An argument can be made that JUT could actually increase real output volatility because wholesale production is now more closely linked to demand.

Retail Trade

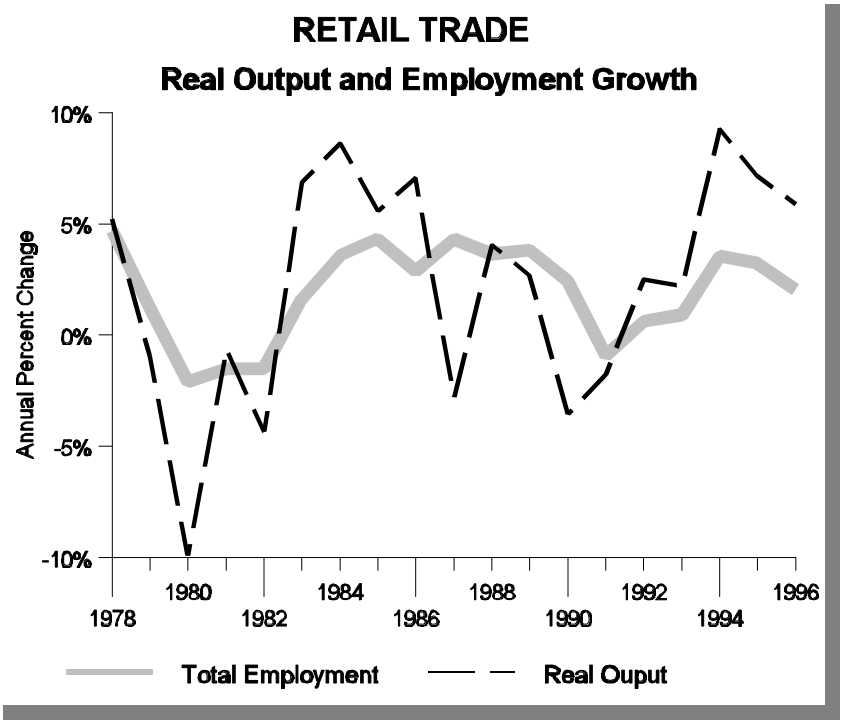
The retail trade sector comprises a number of industries that sell finished goods directly to the consumer. These goods include apparel, home supplies, sporting equipment, and food. Employing 935,600 persons in 1996, retail trade is a labor intensive sector — its share of employment in the state is greater than its share of real output. The largest retail trade industry in terms of employment is the restaurant industry, employing upwards of 290,000 people in 1996.

Retail trade accounted for about 8.3% of real output produced in Michigan in 1977, and its share has increased slightly — to about 9.4% today. In comparison, retail trade accounted for about 16.2% of the total employment in 1977, and its share of employment also has increased slightly — to about 17.7% today.

The retail trade industries added over 283,000 jobs between 1977 and 1996, an increase of 43.4%. Over this same time span, the retail trade sector increased real output approximately 50%.

Growth in real output in this sector has been extremely volatile over the past two decades. Employment growth has been somewhat less volatile (**Figure 9**).

Figure 9



Finance, Insurance, and Real Estate (FIRE)

The finance, insurance, and real estate (FIRE) sector consists of the banking industry, the automobile insurance and health insurance fields, and the real estate industry — among others. FIRE accounted for 14.6% of real state output in 1977, and today accounts for approximately 15.0% of state real output. FIRE accounted for approximately 6.2% of state employment in 1977, and 6.7% today.

In contrast to retail trade, the FIRE sector is not labor intensive — its share of employment in the state is less than its share of real output. Another significant difference between these two sectors is that wage and salary employment accounts for a much smaller share of FIRE than retail trade employment.

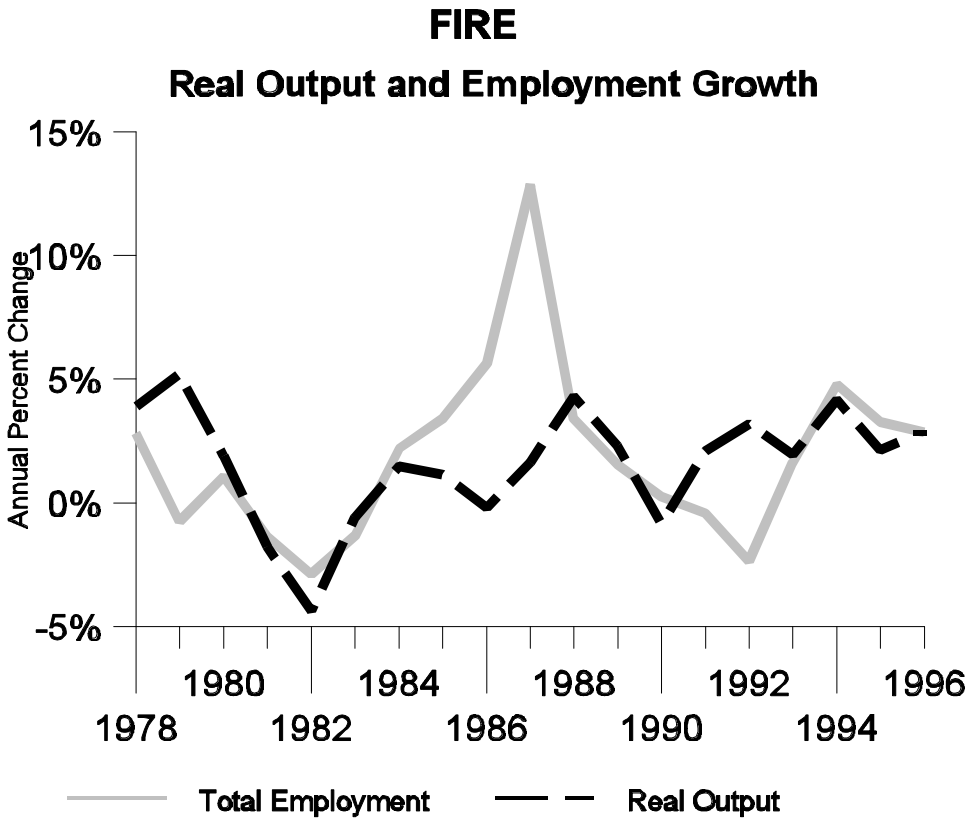
Finance, insurance, and real estate (FIRE) employment volatility is greater than retail trade and other major sectors' employment volatility. One reason for this is that wage and salary employment comprises between 85.0% and 90.0% of total retail trade employment (about the statewide average), but only approximately 60.0% of FIRE employment.

Figure 10 shows FIRE employment and real output annual growth from 1977 to 1996.[28] Contrary to other major sectors in Michigan, employment volatility is actually more pronounced than real output volatility. This is due almost entirely to non-wage and salary employment. The relatively low share of wage and salary employment in the FIRE sector implies that it will continue to be volatile in the future.

The one thing that retail trade and FIRE have in common is that on net, over the past two decades, neither has significantly altered its share of total real output or employment in the state. Real output per worker is very near its 1977 level in each sector, and employment and real output have demonstrated no significant alterations in their levels of volatility in either sector over the past 20 years.

[28] The spike in employment growth that occurred in 1987 is partly a result of a change in the standard industrial code classification definition of FIRE.

Figure 10


FIRE
Real Output and Employment Growth
15%
10%
5%
0%
-5%
Annual Percent Change
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
Total Employment
Real Output

Services

The service sector consists of industries that, in one way or another, provide support and/or deliver convenience to individuals or to firms. Examples include medicine, law, employment agencies, etc.

The services sector has experienced significant changes in the last 20 years.

- Between 1977 and 1996, the services sector increased its workforce by more than 95.0%, a gain of almost 750,000 workers.

- Between 1977 and 1996, the services sector increased real output 55.3%.

Taken by itself, the real output gain appeared to be excellent, but it failed to keep pace with employment gains. Therefore, although services industries have grown dramatically, a fall in productivity and the average amount of real output each worker produces has accompanied the growth.

Some of this disparity likely is exaggerated by measurement problems. Real output estimates in the services sector are difficult to adjust for inflation because measuring quality improvement of services is difficult. In addition, there is a lack of concrete real output measures. Thus, over time, the value of real output in the services industries tends to be understated. Additionally, outsourcing tends to understate real output in the services sector for the same reason it overstates real output in the manufacturing sector.[29] However, these downward biases cannot account for all of the decrease in real output per worker experienced in the services sector.

Taking a closer look at this sector, it appears that all of the major service industries experienced growth between 1977 and 1996. Prominent among these were the health care, social services, membership organizations, legal services, and business services industries.[30]

[29] See note 18.

[30] Data for the business services industry is not reliable before 1987.

Legal services illustrates both the trend toward labor intensity and the difficulty in measuring real output in the services sector. Between 1977 and 1996, firms in this industry increased their workforce by 80.4% on average (about 17,500 workers), yet managed to lose 3.3% of their measured total real output. It is probable that some of this growth imbalance is caused by productivity declines, but it also is likely that the imbalance results partly from measurement error.

The only service industry able to achieve a greater increase in measured real output than employment was membership organizations (clubs, leagues, etc.). The health care services industry has overtaken the motor vehicle manufacturing industry as Michigan's largest single direct private employer. Today, the health care industry employs more than 403,000 workers, compared to just 285,600 in the motor vehicle manufacturing industry.[31]

[31] Motor vehicle parts suppliers classified in the wholesale trade sector employed approximately 25,700 workers as of 1992.