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EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL OF ECONOMIC ADVISERS
WASHINGTON, D.C. 20500

July 11, 1985

MEMORANDUM FOR: Roger Porter
Office of Policy Development

FROM: Beryl W. Sprinkel Beryl W. Sprinkel
Chairman

SUBJECT: Paper on "Deindustrialization"

Attached is the CEA paper promised on "Is the U.S. Economy Undergoing 'Deindustrialization'." The other two papers on pending bills and trade complaints were sent to this office, but I understand that these have been forwarded to you for circulation.

July 11, 1985
CEA

Is the United States Undergoing "Deindustrialization"?

The public perception that the U.S. economy is undergoing "deindustrialization" is widespread and has grown substantially in recent years. Many apparently believe that the tradable goods sector, especially manufacturing, is in decline due both to inappropriate policies here at home (the tight money-large budget deficit-strong dollar argument) and to unfair trading practices among our trading partners. Thus, it is claimed, industry is expanding abroad at the expense of industry in the United States. This paper examines whether such arguments are valid.

Deindustrialization presumably refers to a persistent decline in the productive capacity of the manufacturing sector. However, the term is also sometimes used to refer to the goods-producing sector in general, which includes agriculture and mining as well as manufacturing. Productive capacity itself is not directly observed, but is the result of investments in capital stock, employment and other inputs, and the technology of production. Over long periods of time, where one can abstract from demand conditions, actual output is the best measure of trends in productive capacity. Over shorter periods, trends in the capital stock can also be used if the rate of technological change is low. Trends in employment are generally a poor measure of trends in productive capacity -- in the short run because of cyclical variations in demand, and in the longer run because of changes in technology.

In subsequent sections we describe and evaluate trends in major sectors of the economy, compare U.S. economic performance overall and in manufacturing to the performance of other countries, and summarize and evaluate exceptional trends in detailed industries.

Trends in Major Sectors

Analysis of recent and longer-term trends in the total, goods-producing, and manufacturing sectors of the U.S. economy suggests the following conclusions:

1) The average annual rate of growth for manufacturing output from 1947-84 is exactly the same as for total real gross domestic product (GDP) -- 3.4 percent (see Table 1). For the more recent period from 1980-84, manufacturing output has continued to grow at about the same rate as total real GDP (2.7 versus 2.8 percent).

2) The average annual rate of growth for the goods-producing sector as a whole (manufacturing plus agriculture and mining) from 1947 to 1984 is somewhat less than for real GDP (3.0 percent versus 3.4 percent), but this reflects lower growth in agriculture and mining rather than in manufacturing (see Table 1). For the more recent period from 1980-84, however, the goods-producing sector grew almost as rapidly as real GDP (2.7 versus 2.8 percent), due primarily to an increase in the rate of growth of agriculture to more than double the rate in the prior three decades.

3) Productivity growth in manufacturing (average labor productivity) substantially exceeds that of the economy as a whole (2.7 percent versus 1.2 percent for 1980-84), and this has been increasingly true in recent decades (see Table 2).

   o The explanation lies both in greater rates of technological change and in shifts to more capital-intensive industries and techniques. Part of the explanation for the shift to more sophisticated, capital-intensive techniques and industries lies in the dynamic adjustment of the U.S. economy to increased competition from abroad in more labor-intensive areas.

   o The result of greater productivity growth in manufacturing (together with the similarity of manufacturing output growth and total output growth) is that manufacturing employment has expanded less rapidly than total employment in each of the last four decades (see Table 3).

4) Cyclical fluctuations in the goods-producing and manufacturing sectors are exaggerated relative to the economy as a whole. This well-known attribute of these sectors is easily demonstrated for the 1980-84 period and largely explains their performance during this period.

- o With respect to output, Figure 1(a) illustrates that the most recent recession was substantially more severe than the average and Figure 1(b) that the subsequent recovery was exceptionally strong. The result was an even lower trough for the goods-producing sector (see Figure 2(a)) and an even stronger recovery (see Figure 2(b)). Similar effects are seen for manufacturing in Figures 3(a) and 3(b). Another few quarters are required before the full extent of the current recovery can be assessed.

- o With respect to employment, a similar phenomenon is observed. Figure 4(a) illustrates that total employment declined more than in the average recovery and Figure 4(b) that total employment growth was more rapid than average during the recovery. The even more exaggerated decline in goods-producing employment is presented in Figure 5(a), and Figure 5(b) depicts the exceptionally rapid increase in employment during the recovery. A similar pattern is observed for manufacturing employment in Figures 6(a) and 6(b). The slight downturn of employment in the first-quarter of 1985 is most likely the result of virtually zero growth overall in the first quarter.

International Comparisons

Comparisons of U.S. economic performance overall and in manufacturing to the performance by other countries provide an even more optimistic assessment of the deindustrialization issue and lead to the following major conclusions:

1) The U.S. economy would be in an even stronger position (especially manufacturing) if the rest of the economies of the rest of the world were performing better. In the 1980-84 period, rest of world economic growth was strongly negative, an average annual rate of -6.5 percent (see Table 1). Despite the relative poor performances by many of our trading partners, U.S. economic growth during the period was 2.8 percent overall and 2.7 percent in manufacturing.

2) It is not true that most of our major international competitors have expanded manufacturing output at a faster rate than the United States. Table 4 indicates that U.S. manufacturing production, as measured by industrial production, grew at an annual rate of 2.9 percent from 1980-84, almost twice the average of all OECD countries. Only Japan (with an annual rate of 3.9 percent) stands out as having a distinctly stronger performance by manufacturing. Reflecting the cyclical volatility of manufacturing, growth in manufacturing production in OECD countries was significantly below growth in total production. This is not the case for the United States.

3) Growth in the U.S. manufacturing capital stock for recent years (1979-82) is substantially above the growth rates for most of our industrialized trading partners (see Table 5). The average annual rate is 4.1 for the United States, well above the rates for France, Germany, the United Kingdom, Sweden, Austria, and others. Less precise data based on capacity output (real output divided by average capacity utilization rate) show an even more marked divergence for the period from 1979 through last year (see Table 6). U.S. capacity output in manufacturing grew at an annual rate of 2.5 percent, more than twice the rate for most of our industrialized trading partners.

Trends in Detailed Industries

Sector aggregates clearly conceal varying industry detail within each sector. Appendix A lists GNP by industry at the 2 digit level (65 industries). Appendix B shows real GNP in 1972$ over the postwar period in each of the 65 industries. A brief scan of these charts lead to the following general conclusions.

1) As suggested above, manufacturing industry output is subject to greater cyclical variation than the rest of the economy.

2) Among service industries, only the railroad transportation (0.5% of GNP) and local and interurban transit industries (0.1% of GNP) are in major secular declines.

3) Among mining industries only metal mining (0.06% of GNP) is in a major secular decline.

4) Among manufacturing industries only primary metal industries (1.1% of GNP), tobacco manufactures (0.2% of GNP) and leather (0.1% of GNP) are in major secular declines.

5) Water transportation (0.2% of GNP), the stone, clay, and glass industry (0.5% of GNP), the motor vehicle and equipment industry (1.5% of GNP), the other transportation equipment industries (0.8% of GNP), the petroleum and coal products industry (0.4% of GNP) and construction (2.7% of GNP) have experienced no trend growth over the last 10 years.[1]

If the definition of deindustrialization is limited to industries exhibiting absolute secular declines in production, then the industries listed in 2), 3), and 4) provide one measure of deindustrialization. The U.S. has six industries that comprise approximately 2.0% of GNP that have been in decline.

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[1] Flat value added in the construction industry primarily reflects a shift in fabrication to other industries (i.e., use of dry wall instead of plaster) and the slowdown in Federal highway construction in the 1960s. Real investment in private structures has grown at a 2-1/2 percent average annual rate over the last 15 years.

If the definition also includes industries showing little or no growth in production over the last 10 years then another six industries, enumerated in 5), that comprise 7.0% of GNP should be added to the list.[2]

Across all sectors of the economy -- 65 industries -- 12 industries (less than 10% of GNP) are showing flat or declining output over the last 10 years. Seven of the 12 are in manufacturing, three are service industries, one is mining and construction. All other industries exhibit growth in production that equals or exceeds growth in total real GNP.

In the context of deindustrialization, should the U.S. Government be concerned about the trend in production in the 12 industries listed above? For several, the answer is clearly no. Price supports for tobacco and shifts in demand have driven down tobacco manufactures. Shifts in demand are also responsible for the decline in local and interurban transit. Production has declined in the leather and leather products industry due to shifts in demand and foreign competition. The role of foreign competition, however, appears consistent with dynamic trends in comparative advantage.

For several other industries flat or declining production has resulted from technical innovation and substitution of inputs. As mentioned above, the construction industry has experienced roughly flat value added production over the last 15 years. This does not mean that residential and nonresidential building has been flat. A shift in the source of value added has occurred. Prefabricated components (produced in other industries) now provide a larger proportion of the final product -- a building -- and less production occurs within the construction industry. The decline in the railroad transportation industry, and to a certain extent in the water transportation industry, represents pure substitution from high-cost, relatively inefficient providers of transportation services to lower cost providers such as pipelines. For the petroleum and coal products industry flat production primarily reflects the decline in U.S. oil consumption over the last 12 years. Since 1973 U.S. consumption of petroleum products has fallen at an average annual rate of 1 percent per year. Increases in the relative price of energy and the resulting substitution of other inputs for energy more than account for the decline. In fact, flat to declining output in the refining industry may be viewed as the primary result of a successful adaptation of the U.S. economy to the increase in energy prices in the 1970s. Energy efficiency has increased rapidly in almost all industrial applications.

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[2] This list excludes certain service industries, such as personal services and private households, that do not fit the normal definition of an industry.

If the seven industries discussed above are viewed as irrelevant in this context or declining due to technical innovation and/or substitution to more efficient production processes, then the definition of deindustrialization may be applied to five industries that constitute about 4% of GNP.

These five industries (metal mining; motor vehicles and transportation equipment; stone, clay, and glass; other transportation equipment, and primary metals) share several common characteristics that have played major roles in their decline. These characteristics are:

1) Very high unit labor costs relative to the average of manufacturing (see Figures 7(a)-(e)). For example, real compensation as a share of real output has exceeded 100% in the metal mining industry since 1975 peaking at above 140% in 1980 and 1982 (see Figure 7(a)).

2) Slow growth in demand for the product.

3) Relatively high expenditures to meet government regulations for pollution abatement, safety standards, and energy efficiency standards.

4) Intense international competition except where the U.S. Government has intervened to limit imports. Based on the available evidence, U.S. Government intervention to alleviate characteristic 4) only exacerbated characteristics 1) and 2).

Conclusions

Four specific conclusions are suggested by the evidence reviewed above.

1) The U.S. economy is not undergoing deindustrialization.

   o Long-term and recent trends in manufacturing output are strongly positive and roughly proportional to total growth of the economy, even for 1980-84.

   o Productivity growth in manufacturing continues at a pace more than twice that in the rest of the economy.

   o Employment in manufacturing remains below peak levels. The slow recovery in employment is a consequence of average output growth and above average productivity growth in manufacturing.

2) U.S. economic performance overall and even in manufacturing is significantly better than the performances of the vast majority of our trading partners.

   o Growth in U.S. manufacturing production from 1980-84 is about twice the average of other OECD countries.

   o Recent growth (1979-84) in the U.S. manufacturing capital stock is well in excess of the growth rates for most of our industrialized trading partners.

3) The consequences of variations in economic growth are especially pronounced for manufacturing and the goods-producing sector, helping to explain the deep trough in the last recession for these sectors and their exceptionally strong recovery (which is not yet complete, however).

4) Only a handful of U.S. industries exhibit a persistent decline in real output. For some, import competition has played a major role, but one consistent with underlying trends in comparative advantage.

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TABLES

Table 1

Real Growth in Gross Domestic Product by Industry
(Percent Average Rate of Growth over Period)

	1950s(1)	1960s	1970s	1980s(2)	1947 to 1984
Gross Domestic Product(3)	3.2	3.9	3.0	2.8	3.4
Private	3.3	4.0	3.3	3.1	3.5
Goods	2.4	3.8	2.8	2.7	3.0
Agriculture	0.9	0.7	1.5	3.1	1.5
Mining	2.0	3.4	1.3	0.9	2.0
Manufacturing	2.7	4.3	3.0	2.7	3.4
Durable	2.6	4.4	3.1	3.2	3.4
Non-Durable	2.9	4.1	2.9	2.1	3.3
Construction	4.7	1.5	-0.2	1.2	2.4
Services					
Capital Intensive(4)	3.4	5.1	3.9	2.0	3.5
Trade	3.0	4.2	3.4	4.6	3.7
Wholesale	3.9	5.3	3.8	5.6	4.4
Retail	2.5	3.4	3.1	3.8	3.3
FIRE(5)	4.9	4.3	4.2	3.0	4.4
Other Services	3.4	4.3	4.1	3.7	3.8
Government	3.6	3.6	1.5	0.3	2.6
Rest of the World	5.7	4.4	12.4	-6.5	5.7

(1) Decade Averages
(2) 1980-1984
(3) Also includes statistical discrepancy and the residual between income and product measures.
(4) Transportation and Public Utilities (including Communications)
(5) Finance, Insurance and Real Estate

Table 2

Productivity Growth by Industry
(Growth in Ratio of Real Value Added vs
Number of Full Time Equivalent Employees)

	.......Annual Rate of Change......			
	1950s	1960s	1970s	1980s
Gross Domestic Product	2.2	1.6	1.1	1.2
Private	2.6	1.9	1.2	1.2
Goods	2.8	2.7	2.0	2.4
Agriculture	2.2	4.2	-0.1	0.2
Mining	5.7	4.8	-2.8	0.5
Manufacturing	2.9	2.8	2.5	2.7
Construction	3.0	-0.2	-1.6	0.3
Services				
Capital Intens.	3.7	4.2	2.8	1.2
Trade				
Wholesale	2.8	3.2	1.3	1.7
Retail	1.5	0.6	0.4	0.8
FIRE	1.2	1.1	0.6	-0.1
Other	1.2	0.6	0.3	0.2
Government	0.0	0.3	0.4	0.4

Note: See previous Table forFootnotes

Table 3

Growth in Full-Time Equivalent Employment

(Average Annual Rate in Percent

	1950s	1960s	1970s	1980s	1947 to 1984
Total, wage and salary workers in nonagricultural establishments	1.5	2.3	2.0	1.0	1.7
Manufacturing	.8	1.5	.4	-.2	.6

Source: Department of Labor, Bureau of Labor Statistics.

Table 4

Output Growth in Major Industrial Economies 1960 to 1984

(Average annual rates of change in percent)

	USA		GERMANY		FRANCE		JAPAN		UNITED KINGDOM		OECD	
	GDP	Manufacturing production	GDP	Manufacturing production	GDP	Manufacturing production	GDP	Manufacturing production	GDP	Manufacturing production	GDP	Manufacturing production
1960-1973	4.0	5.4	4.5	5.2	5.6	5.0	10.5	12.5	3.1	3.0	5.0	6.0
1973-1980	2.3	1.8	2.3	1.1	2.7	1.3	3.6	2.9	0.9	-2.2	2.5	1.7
1980-1984	2.5	2.9	.6	-.1	1.2	-1.0	4.0	3.9	1.5	.7	2.0	1.5

Notes.-- Due to various adjustments figures may differ from those from national sources. Manufacturing production is measure by industrial output.

Source: OECD.

Table 5

Changes in capital stock of total manufacturing
(Average annual rates of growth)

	1969-1973	1973-1979	1979-1982
Austria	6.0	3.4	2.7
Finland	6.2	4.0	3.1
France	6.5	4.1	2.8
Germany, Fed. Rep. of	6.0	2.3	1.8
Norway	4.1	4.8	3.3
Sweden	4.4	3.7	2.1
United Kingdom	3.2	2.1	0.6
Canada	4.7	3.9	4.1
United States	2.7	3.8	4.1

Source: OECD

Table 6

Changes in capacity output[a] in manufacturing
(Average annual rates of growth)

Country	Annual average rates of growth 1969-1973	1973-1979	1979-1984
Austria	3.3	3.1	3.7
Belgium	8.1	3.9	0.6
France	6.3	3.7	1.3
Germany, Fed.Rep. of	4.6	2.4	0.9
Italy	7.1	3.0	1.2
Netherlands	..	2.4	-1.0
Sweden	..	..	1.7
United Kingdom	2.7	-	-1.7
Canada	4.8	3.7	3.3
United States	3.6	3.1	2.5

Source: OECD

a. Capacity output is actual real output divided by average capacity utilization rate. Actual real output is the real value added of total manufacturing.

FIGURES

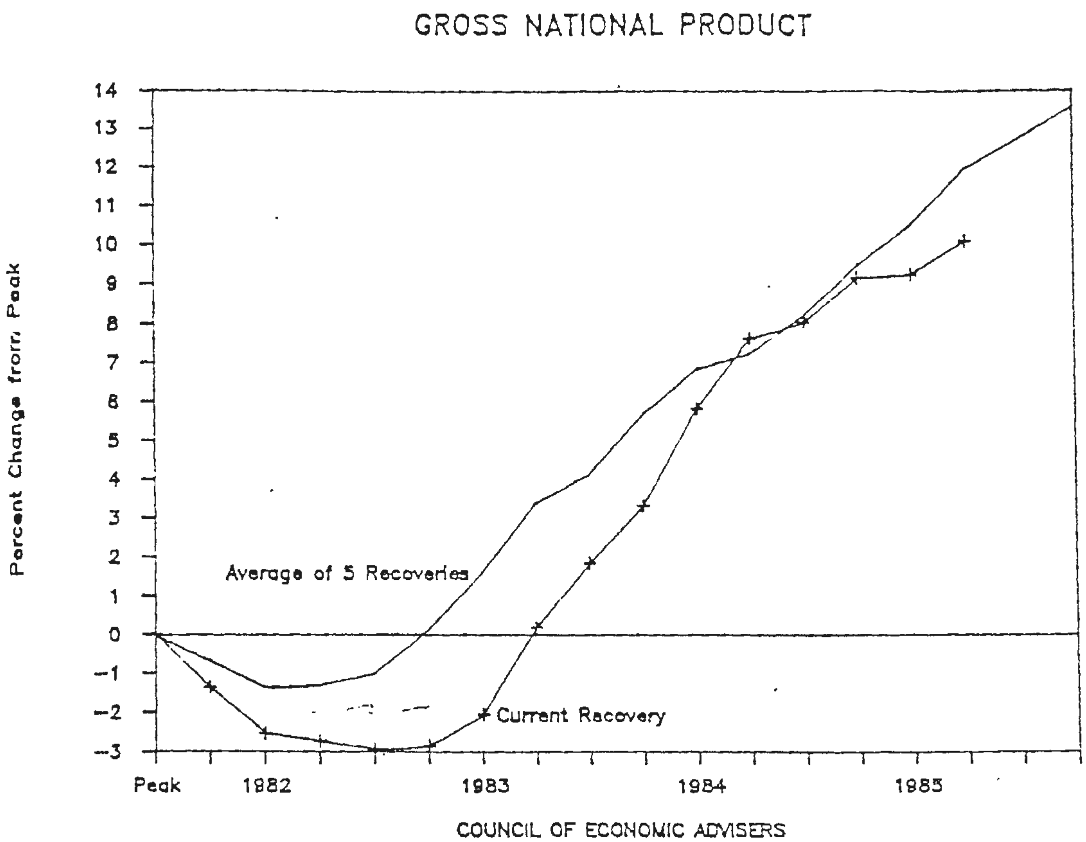
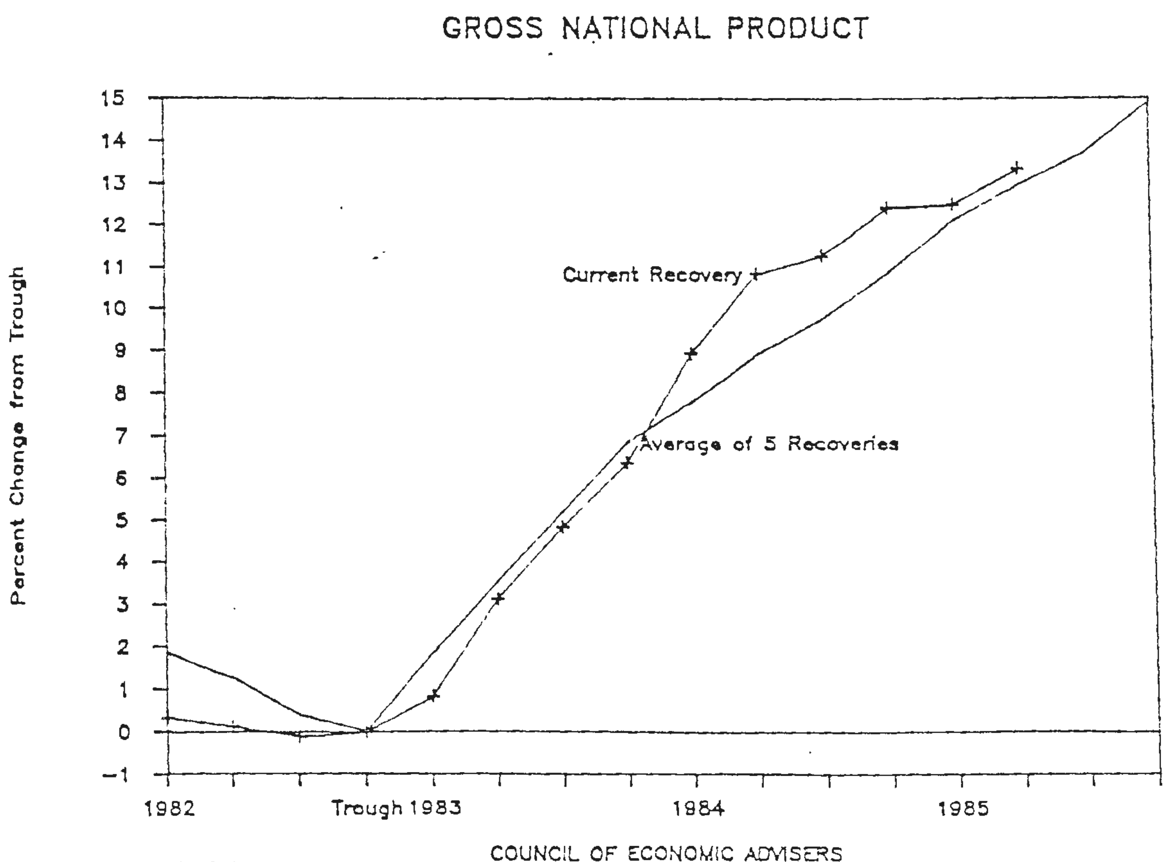


Figure 1(a)



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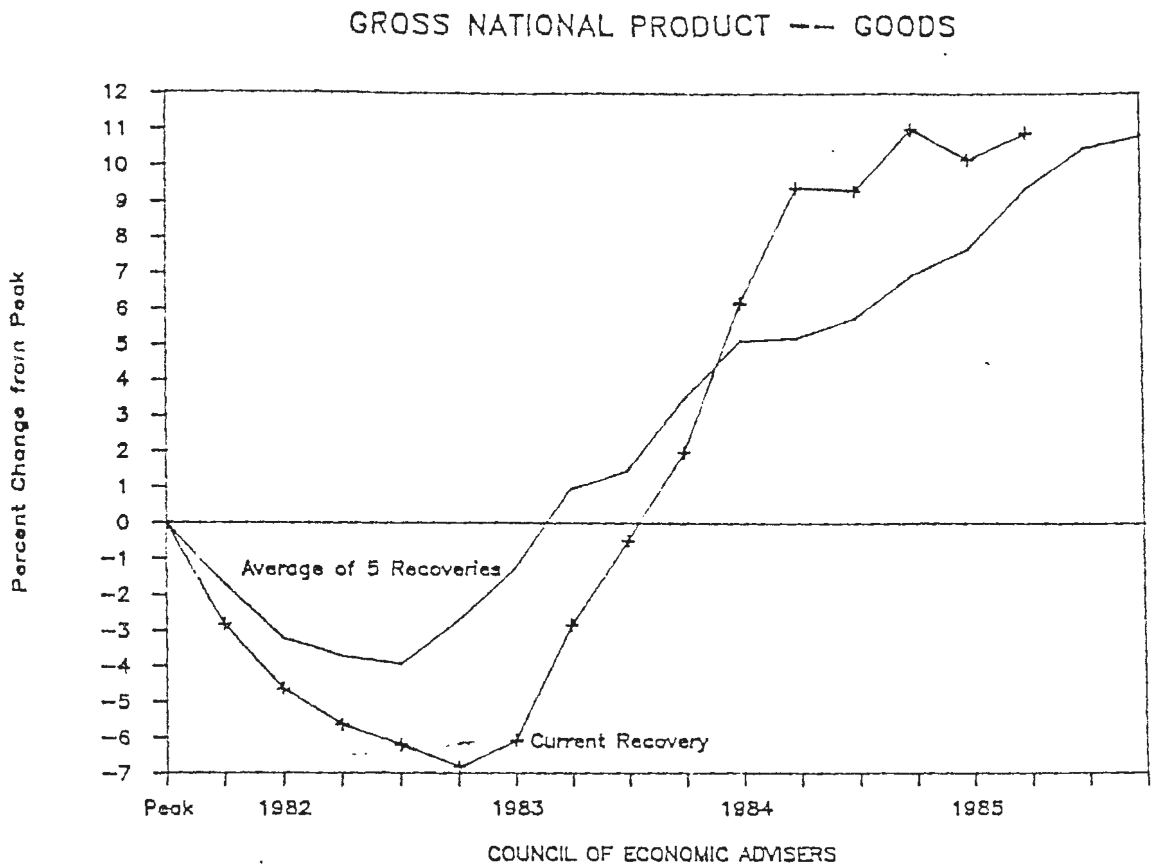

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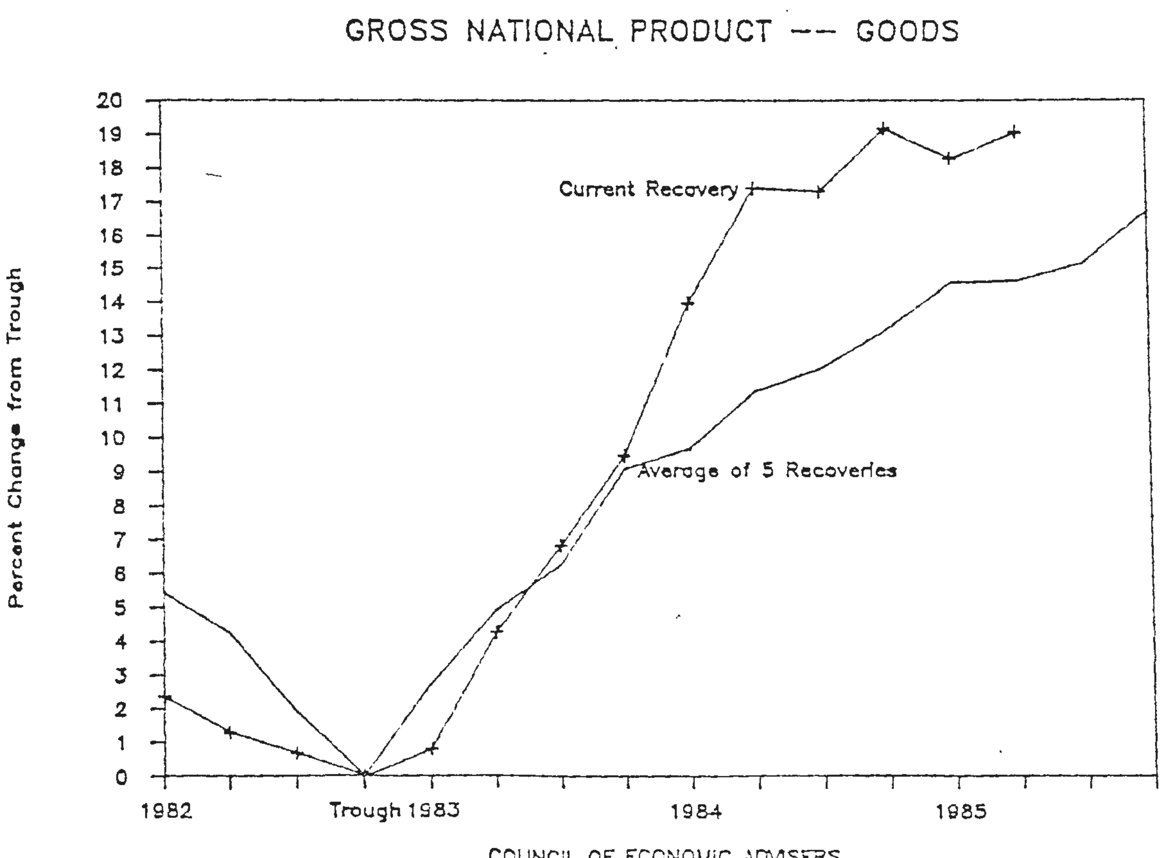

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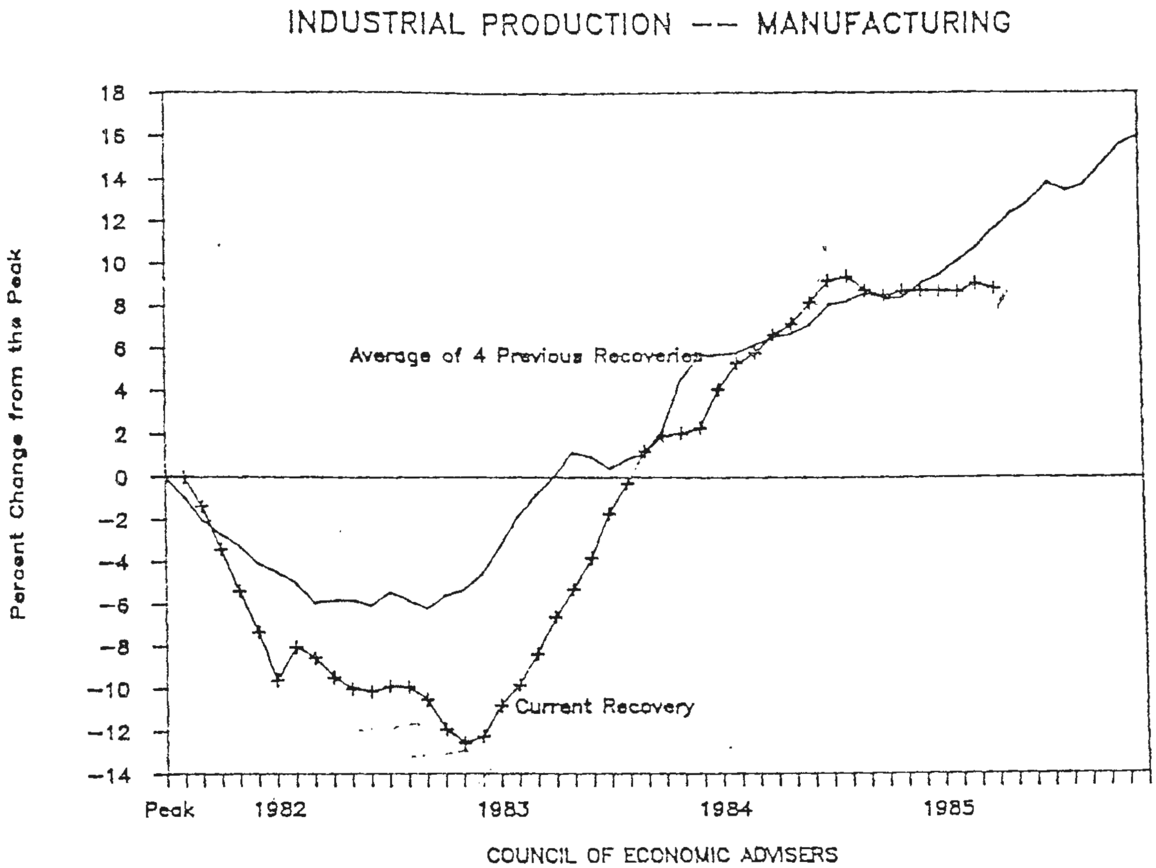

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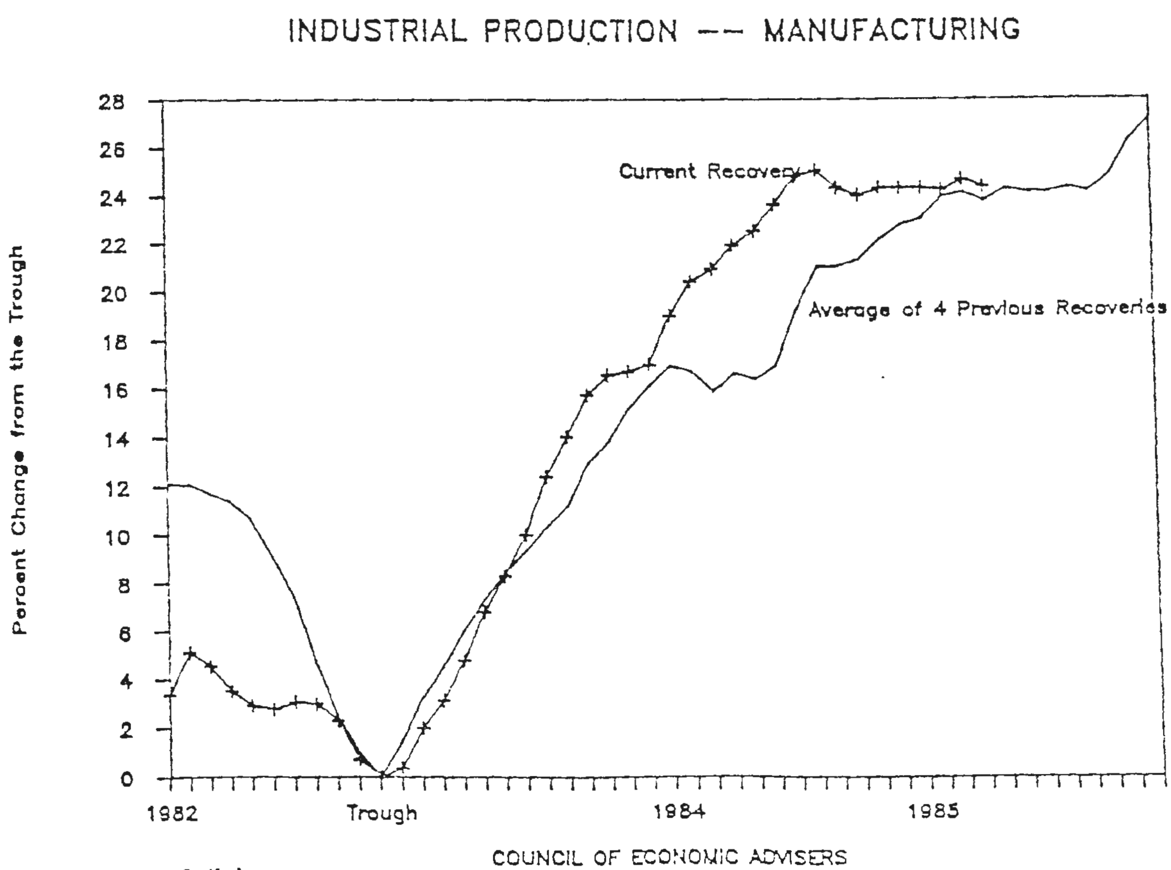


Figure 3(b)

TOTAL PAYROLL EMPLOYMENT

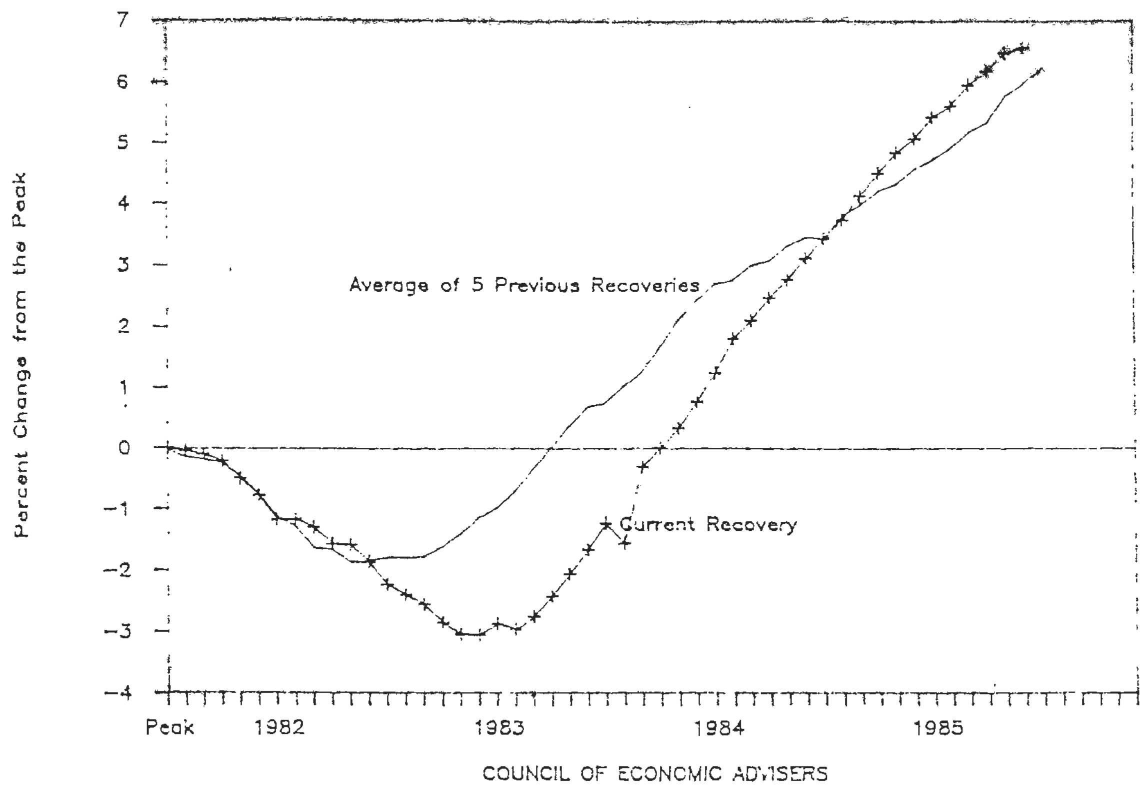
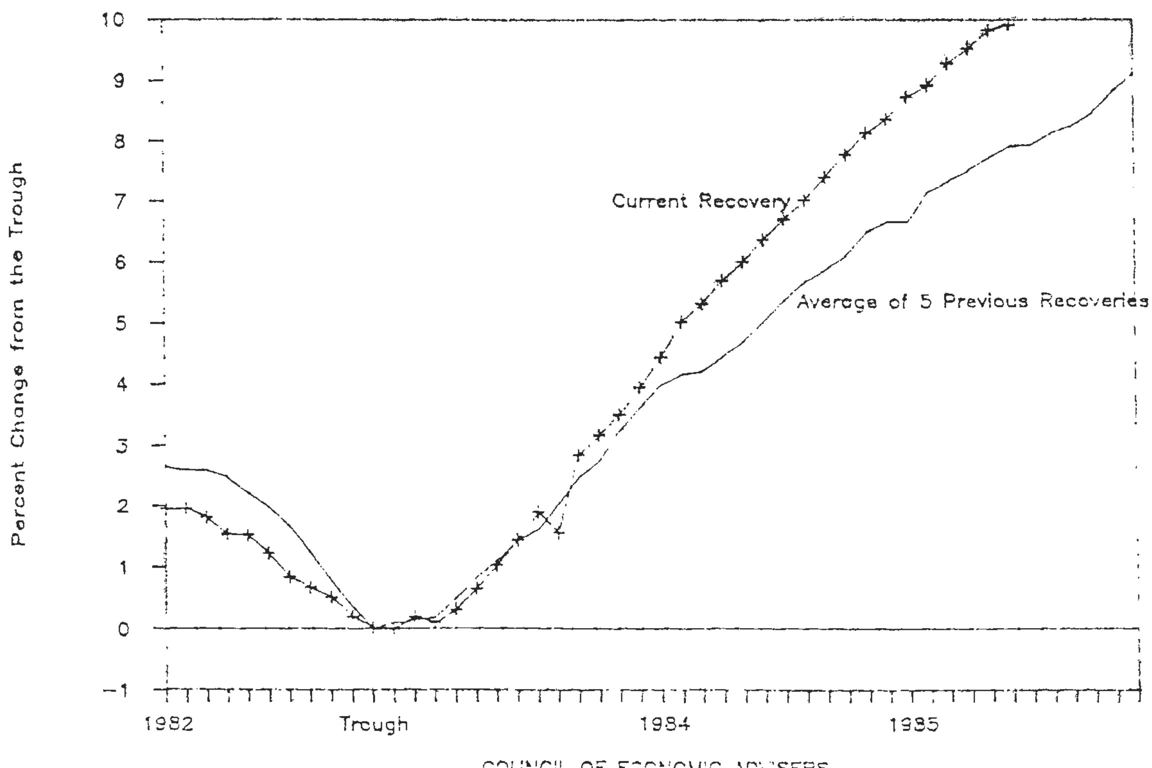


Figure 4(a)

TOTAL PAYROLL EMPLOYMENT



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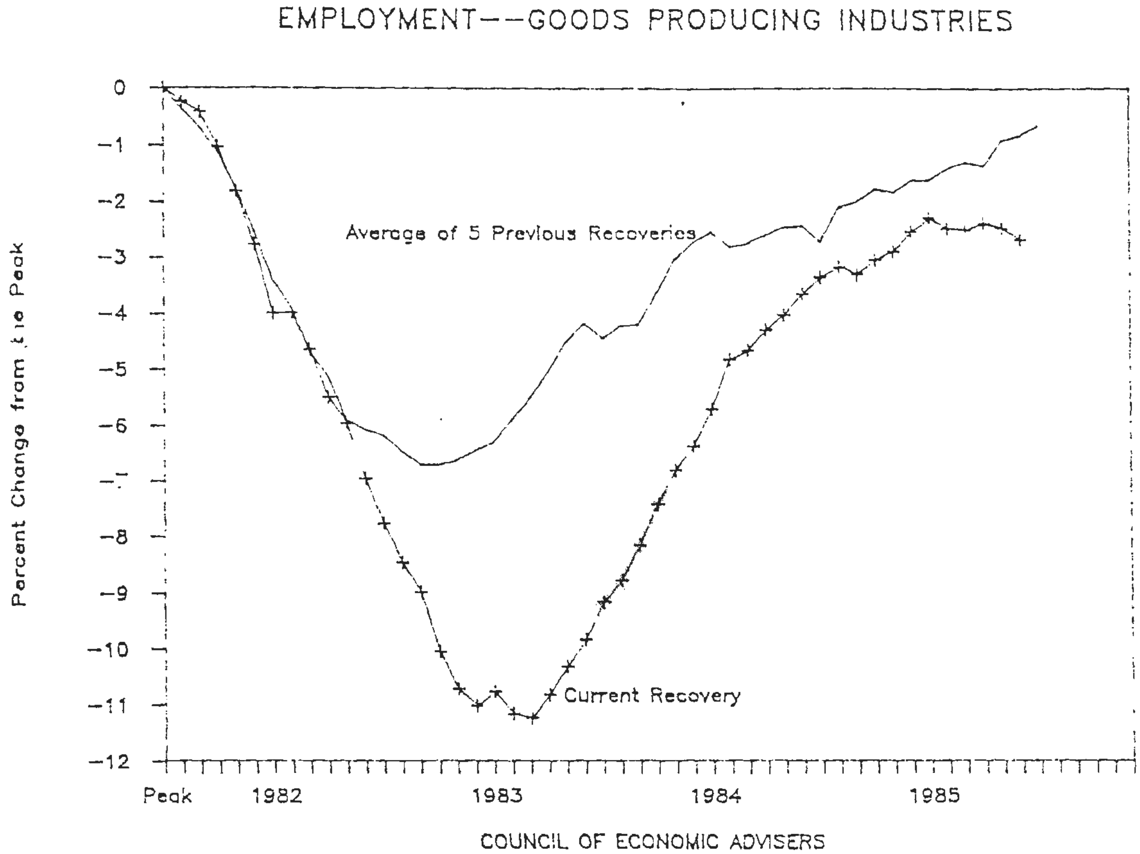

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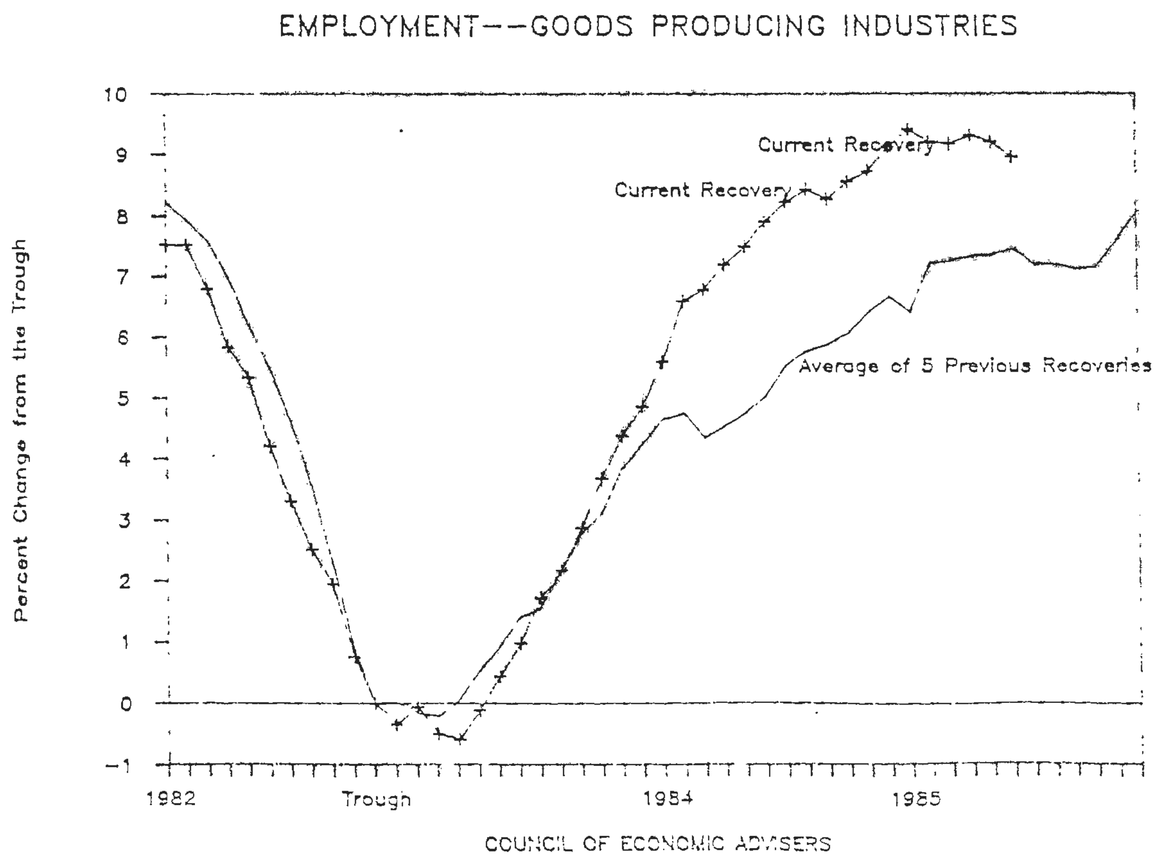

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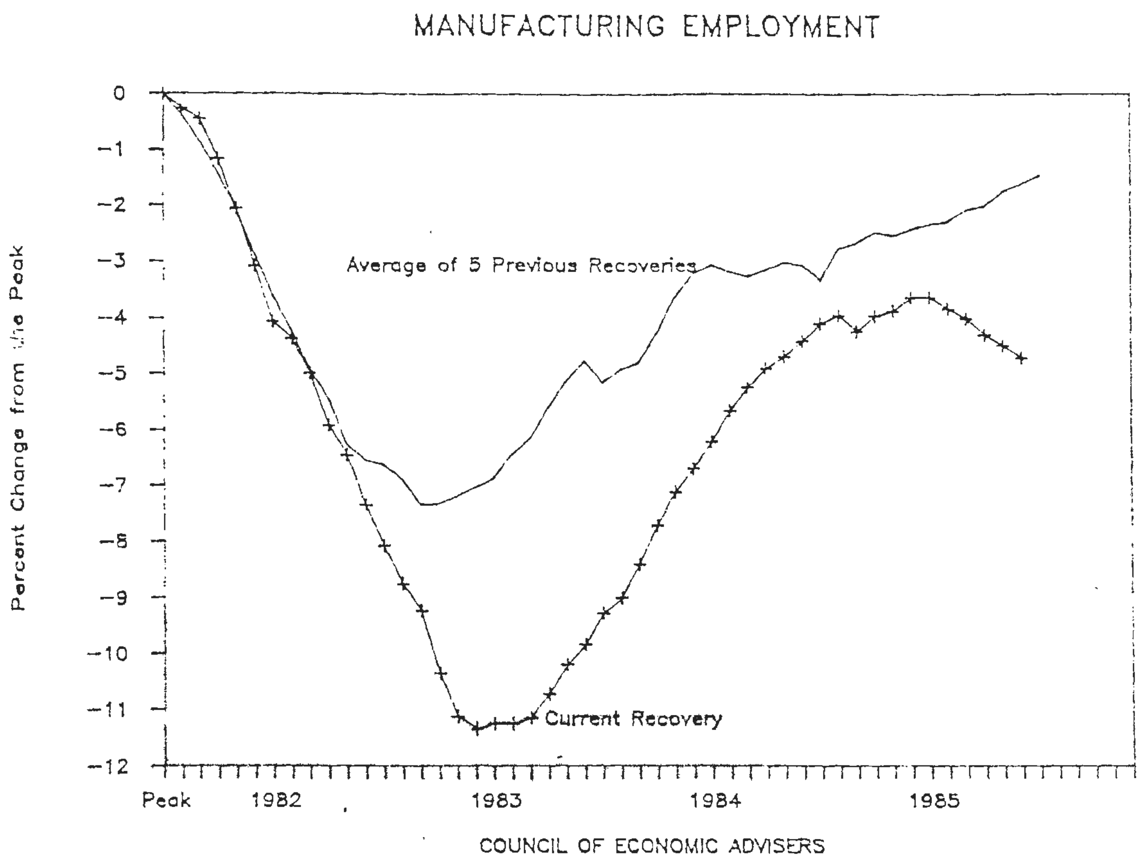

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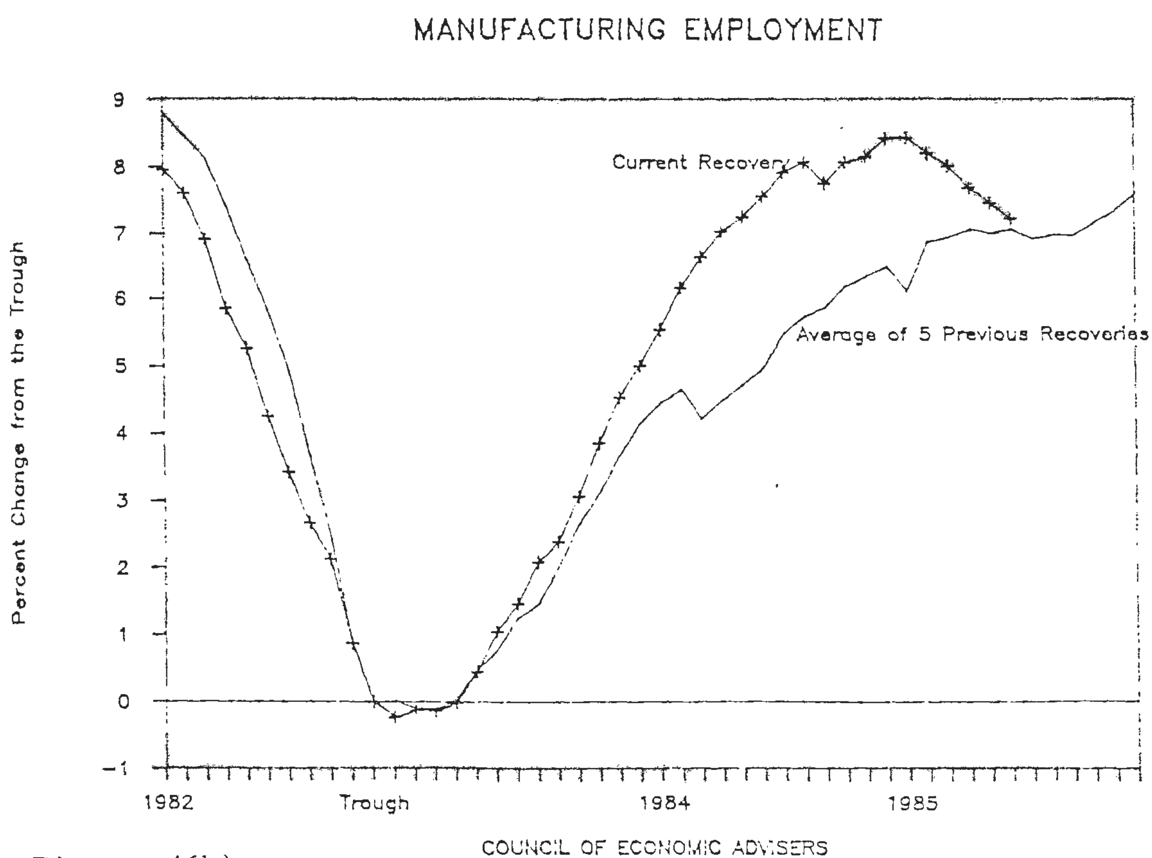

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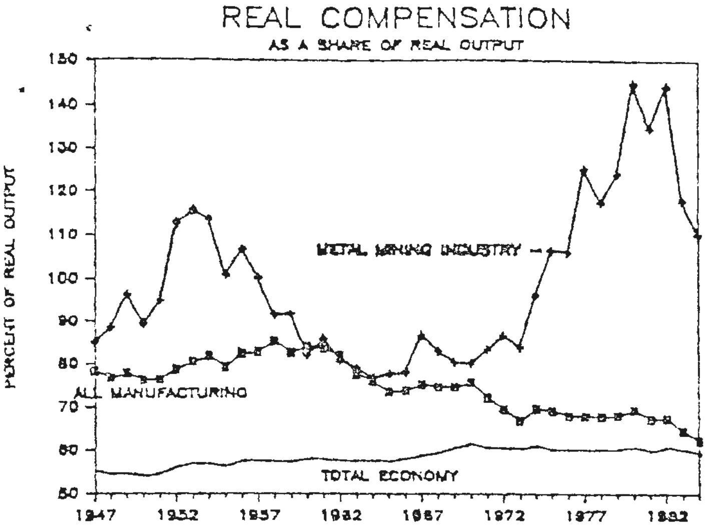

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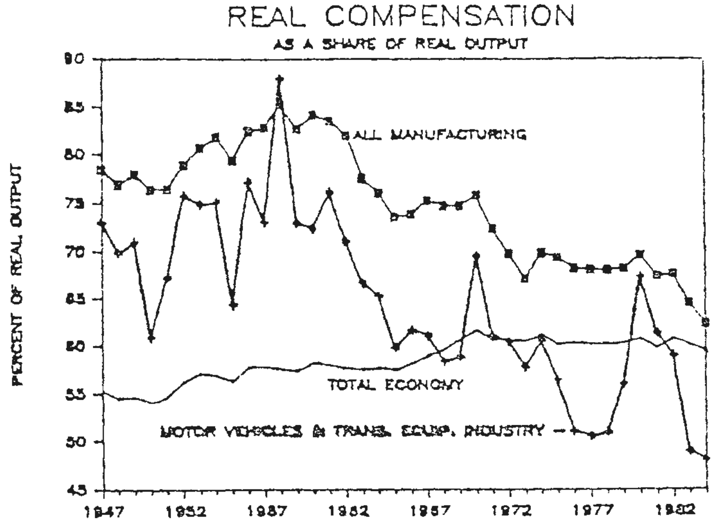

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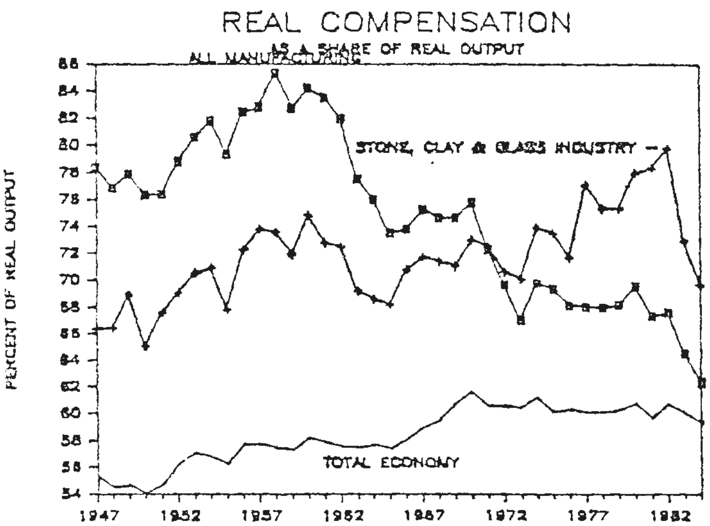

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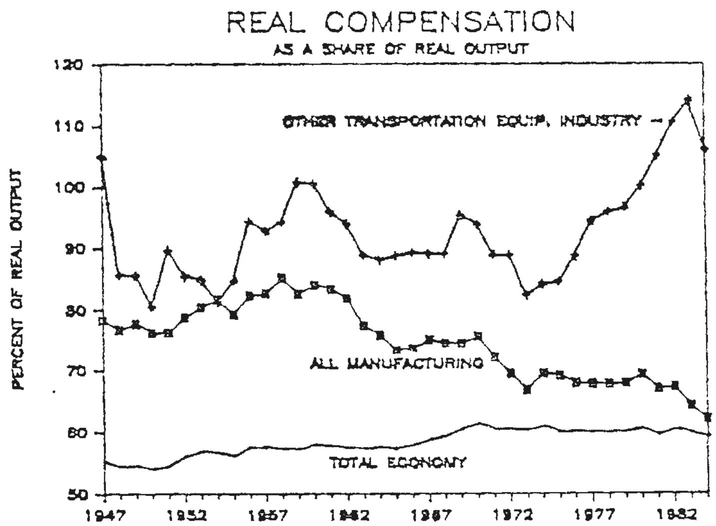

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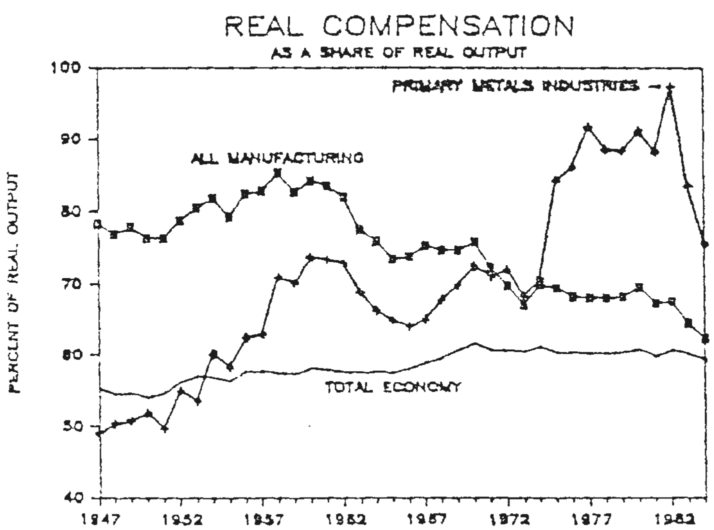


Figure 7(e)

APPENDIXES

		GROSS NATIONAL PRODUCT
	2	DOMESTIC INDUSTRIES (GROSS DOMESTIC PRODUCT)
	3	PRIVATE INDUSTRIES
1	4	AGRICULTURE, FORESTRY, & FISHERIES
	5	FARMS (01-02)
	6	AGRICULTURAL SERVICES, FORESTRY, & FISHERIES (07-09)
2	7	MINING
	8	METAL MINING (10)
	9	COAL MINING (11-12)
	10	OIL & GAS EXTRACTION (13)
	11	NONMETALLIC MINERALS, EXCEPT FUELS (14)
3	12	CONSTRUCTION (15-17)
4	13	MANUFACTURING
	14	DURABLE GOODS
	15	LUMBER & WOOD PRODUCTS (24)
	16	FURNITURE & FIXTURES (25)
	17	STONE, CLAY, & GLASS PRODUCTS (32)
	18	PRIMARY METAL INDUSTRIES (33)
	19	FABRICATED METAL PRODUCTS (34)
	20	MACHINERY, EXCEPT ELECTRICAL (35)
	21	ELECTRIC & ELECTRONIC EQUIPMENT (36)
	22	MOTOR VEHICLES & EQUIPMENT (371)
	23	OTHER TRANSPORTATION EQUIPMENT (372-379)
	24	INSTRUMENTS & RELATED PRODUCTS (38)
	25	MISCELLANEOUS MANUFACTURING INDUSTRIES (39)
5	26	NONDURABLE GOODS
	27	FOOD & KINDRED PRODUCTS (20)
	28	TOBACCO MANUFACTURES (21)
	29	TEXTILE MILL PRODUCTS (22)
	30	APPAREL & OTHER TEXTILE PRODUCTS (23)
	31	PAPER & ALLIED PRODUCTS (26)
	32	PRINTING & PUBLISHING (27)
	33	CHEMICALS & ALLIED PRODUCTS (28)
	34	PETROLEUM & COAL PRODUCTS (29)
	35	RUBBER & MISCELLANEOUS PLASTIC PRODUCTS (30)
	36	LEATHER & LEATHER PRODUCTS (31)
	37	TRANSPORTATION AND PUBLIC UTILITIES
6	38	TRANSPORTATION
	39	RAILROAD TRANSPORTATION (40)
	40	LOCAL & INTERURBAN PASSENGER TRANSIT (41)
	41	TRUCKING & WAREHOUSING (42)
	42	WATER TRANSPORTATION (44)
	43	TRANSPORTATION BY AIR (45)
	44	PIPELINES, EXCEPT NATURAL GAS (46)
	45	TRANSPORTATION SERVICES (47)
7	46	COMMUNICATION
	47	TELEPHONE & TELEGRAPH (481,2,9)
	48	RADIO & TELEVISION BROADCASTING (483)
8	49	ELECTRIC, GAS, & SANITARY SERVICES (49)
	50	WHOLESALE TRADE (50-51)
9	51	RETAIL TRADE (52-59)
10	52	FINANCE, INSURANCE, & REAL ESTATE
	53	BANKING (60)
	54	CREDIT AGENCIES OTHER THAN BANKS (61)
	55	SECURITY, COMMODITY BROKERS & SERVICES (62)
	56	INSURANCE CARRIERS (63)
	57	INSURANCE AGENTS, BROKERS, & SERVICES (64)
	58	REAL ESTATE (65-66)
	59	HOLDING & OTHER INVESTMENT COMPANIES (67)

61 HOTELS & OTHER LODGING PLACES (70)
62 PERSONAL SERVICES (72)
63 BUSINESS SERVICES (73)
64 AUTO REPAIR, SERVICES, & GARAGES (75)
65 MISCELLANEOUS REPAIR SERVICES (76)
66 MOTION PICTURES (78)
67 AMUSEMENT & RECREATION SERVICES (79)
68 HEALTH SERVICES (80)
69 LEGAL SERVICES (81)
70 EDUCATIONAL SERVICES (82)
71 SOCIAL SERVICES & MEMBERSHIP ORGANIZATIONS (83,86)
72 MISCELLANEOUS PROFESSIONAL SERVICES (84,89)
73 PRIVATE HOUSEHOLDS (88)

74 GOVERNMENT & GOVERNMENT ENTERPRISES

12 75 GOVERNMENT

76 FEDERAL GOVERNMENT (91-97)
77 STATE & LOCAL GOVERNMENT (91-96)

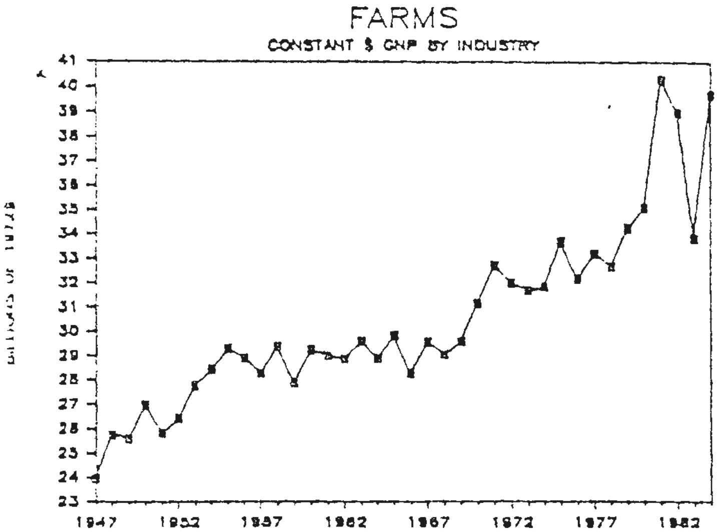
78 GOVERNMENT ENTERPRISES

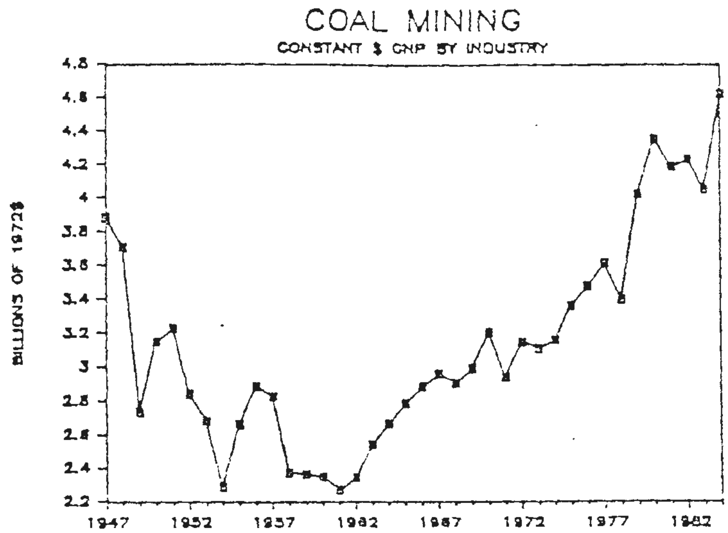
79 FEDERAL GOVERNMENT ENTERPRISES (01-89)
80 STATE AND LOCAL ENTERPRISES (01-89)

81 STATISTICAL DISCREPANCY

82 RESIDUAL

13 83 REST OF THE WORLD


FARMS
CONSTANT $ GNP BY INDUSTRY
1947 1952 1957 1962 1967 1972 1977 1982


COAL MINING
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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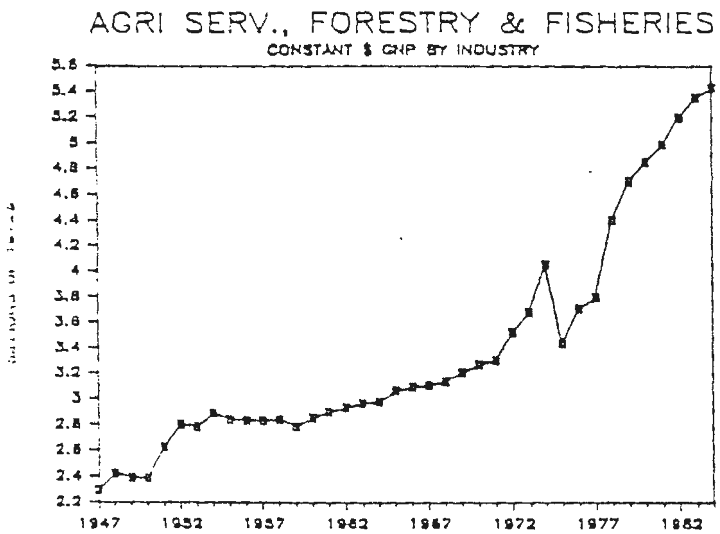
AGRI SERV., FORESTRY & FISHERIES
CONSTANT $ GNP BY INDUSTRY
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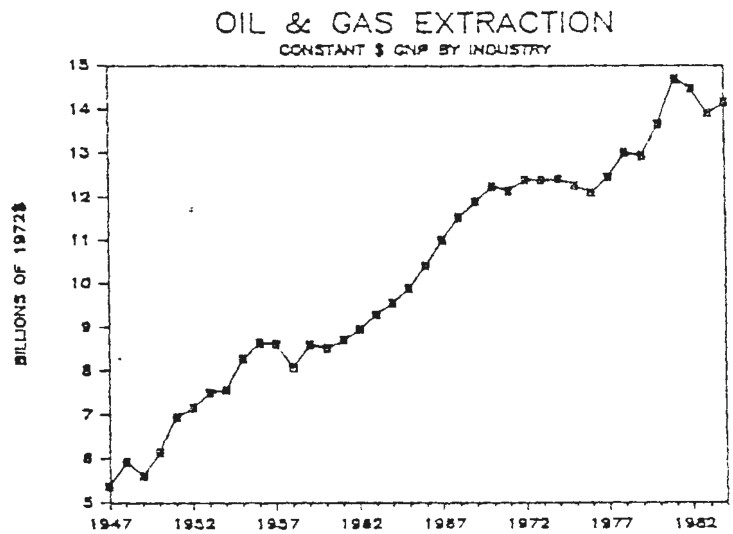
OIL & GAS EXTRACTION
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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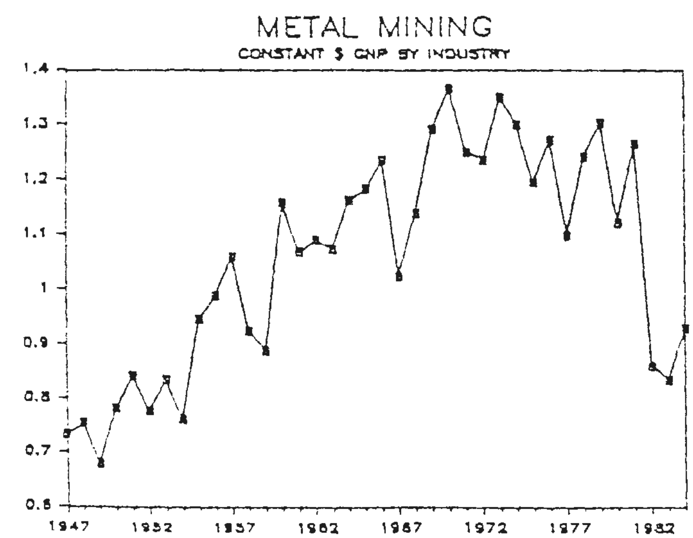
METAL MINING
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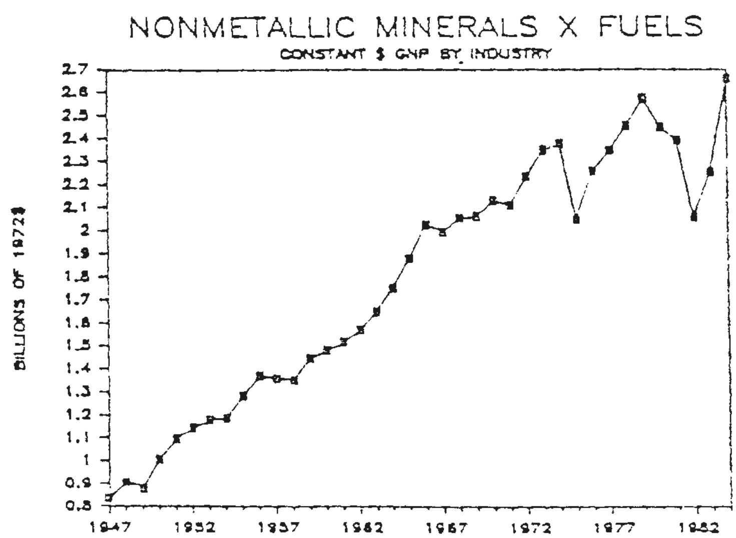
NONMETALLIC MINERALS X FUELS
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BILLIONS OF 1972$
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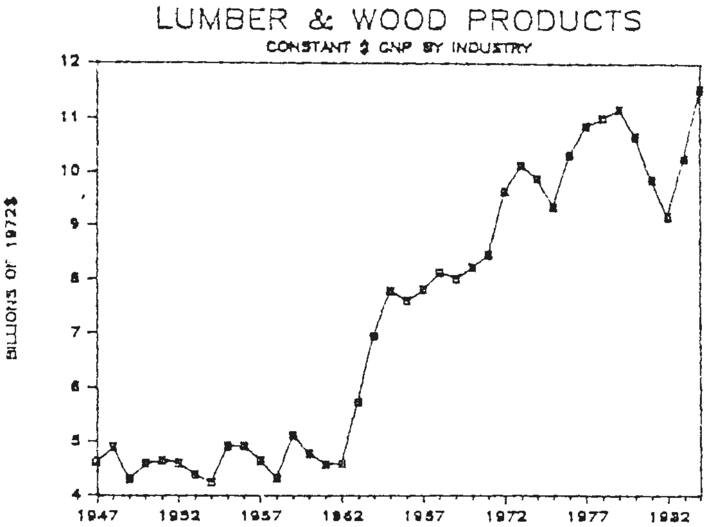
LUMBER & WOOD PRODUCTS
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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11
10
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4
1947
1952
1957
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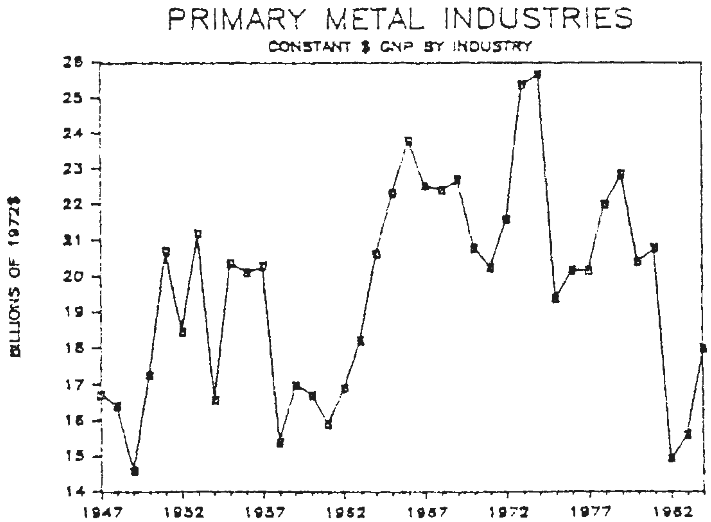
1967
1972
1977
1982


PRIMARY METAL INDUSTRIES
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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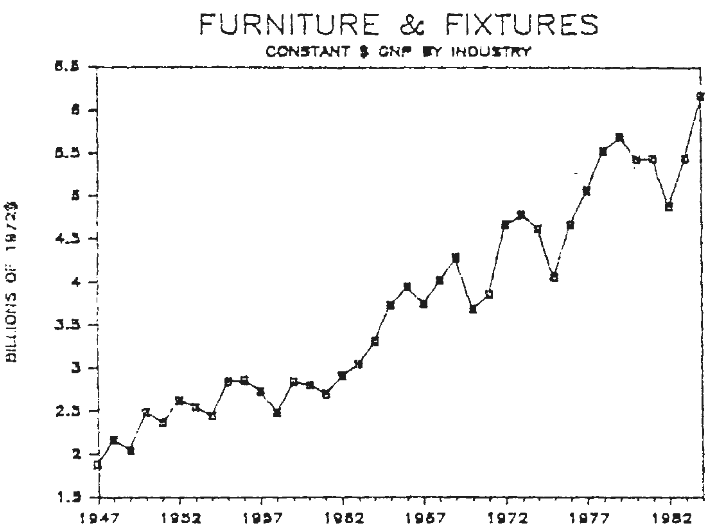
FURNITURE & FIXTURES
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
6.5
6
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3
2.5
2
1.5
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1952
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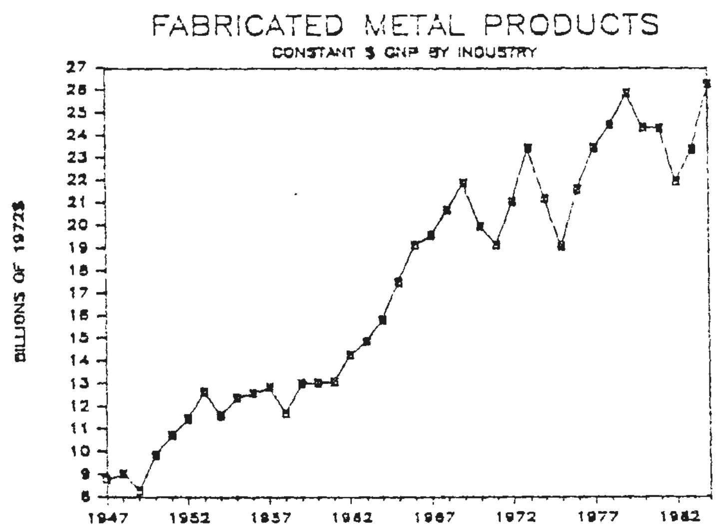
FABRICATED METAL PRODUCTS
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
27
26
25
24
23
22
21
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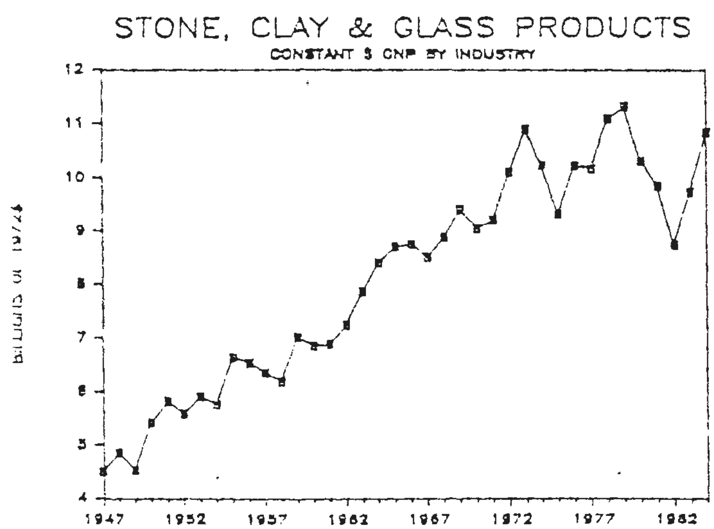
1982


STONE, CLAY & GLASS PRODUCTS
CONSTANT $ GNP BY INDUSTRY
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1952
1957
1962
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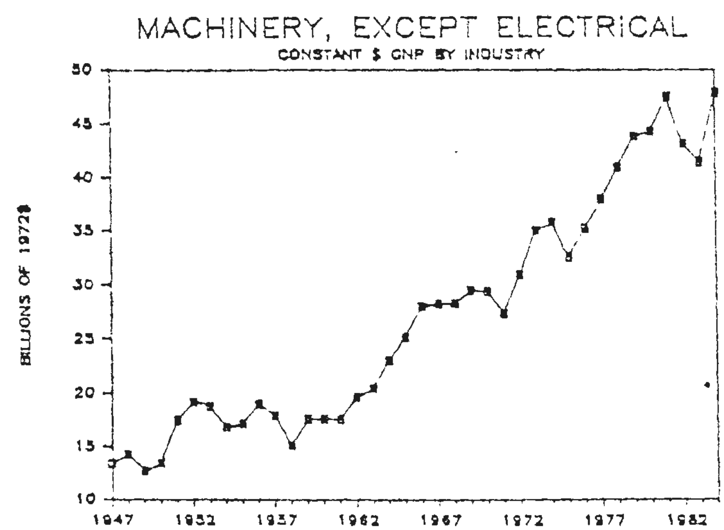
1972
1977
1982


MACHINERY, EXCEPT ELECTRICAL
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
50
45
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35
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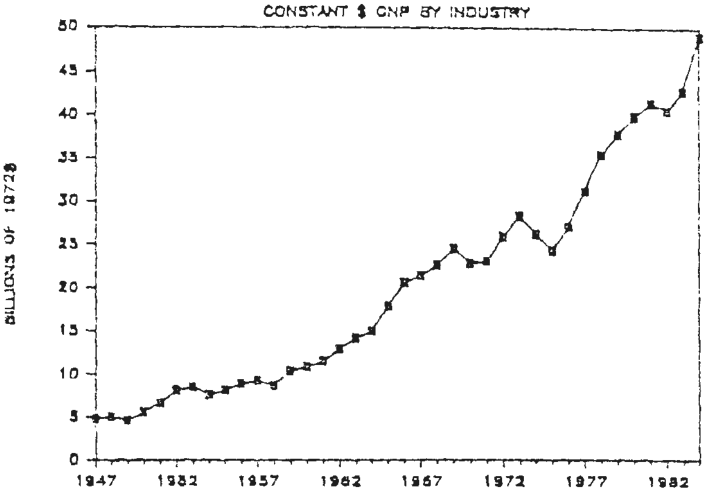
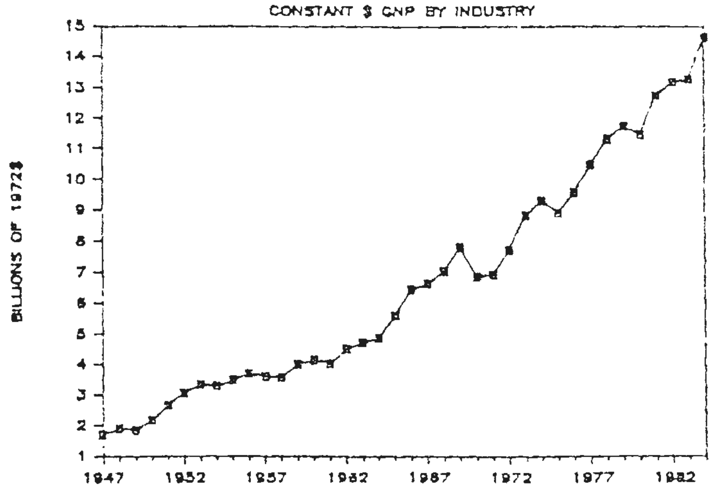
1947
1952
1957
1962
1967
1972
1977
1982

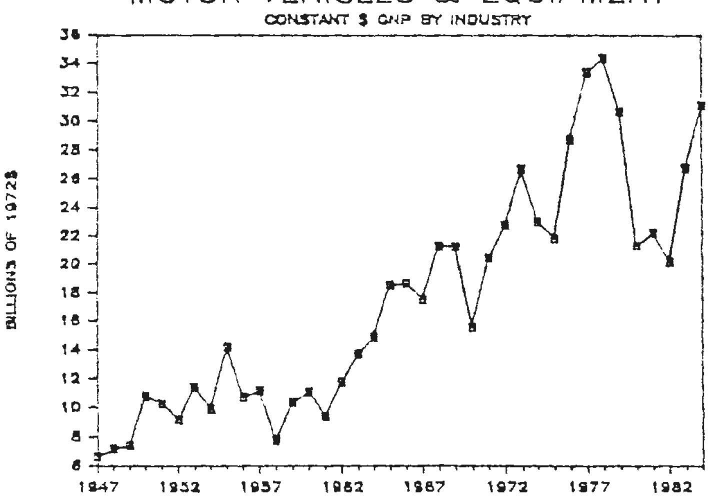
ELECTRIC & ELECTRONIC EQUIP.



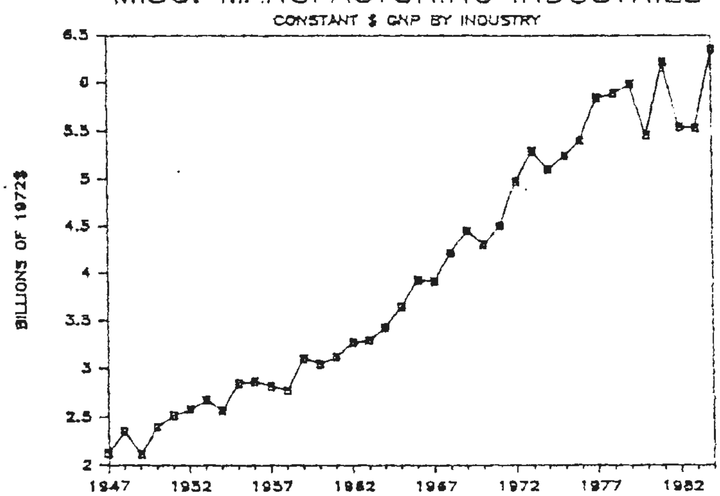
INSTRUMENTS & RELATED PRODUCTS



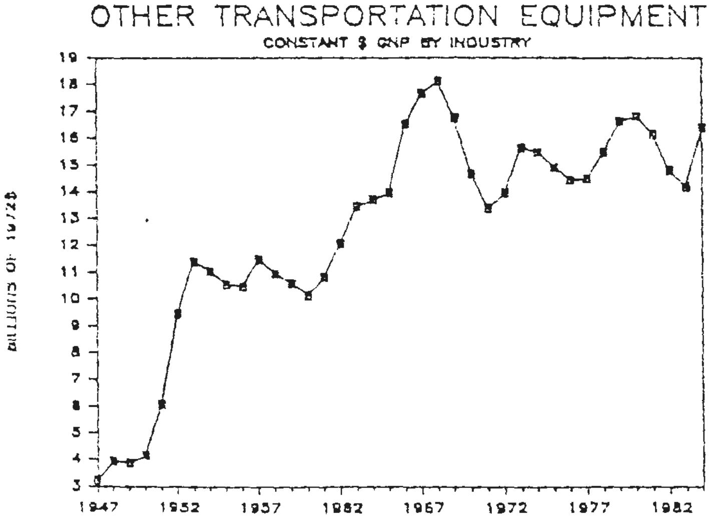
MOTOR VEHICLES & EQUIPMENT



MISC. MANUFACTURING INDUSTRIES



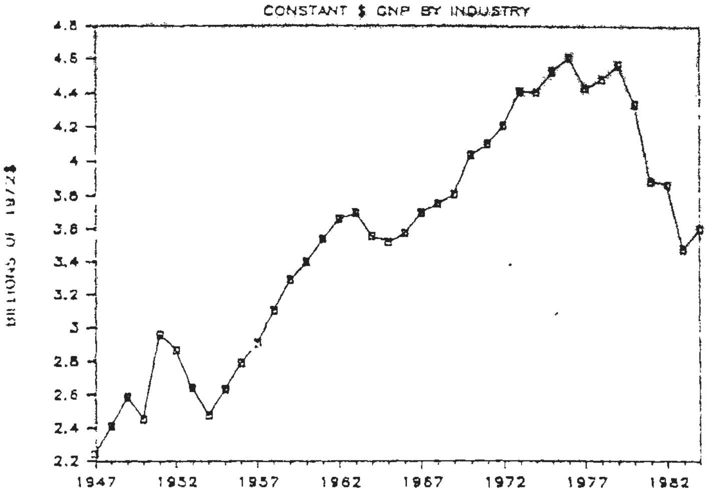
OTHER TRANSPORTATION EQUIPMENT



FOOD & KINDRED PRODUCTS

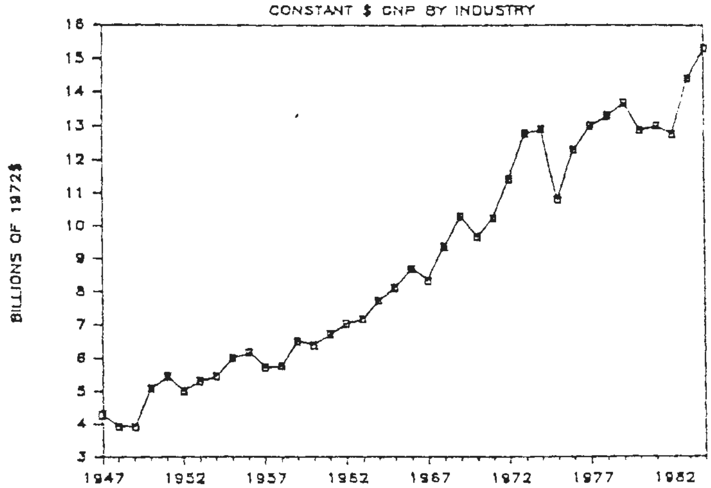
TOBACCO MANUFACTURES

CONSTANT $ GNP BY INDUSTRY



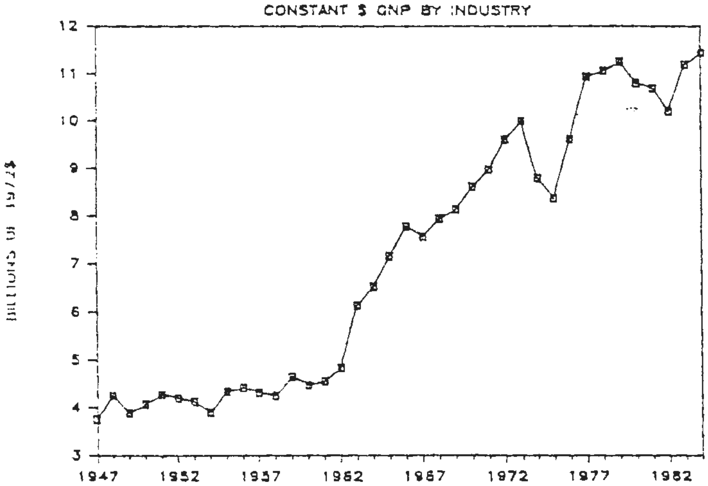
PAPER & ALLIED PRODUCTS

CONSTANT $ GNP BY INDUSTRY



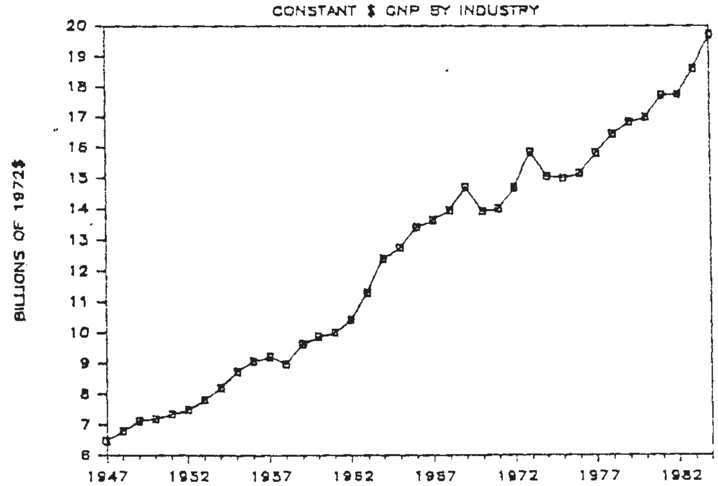
TEXTILE MILL PRODUCTS

CONSTANT $ GNP BY INDUSTRY



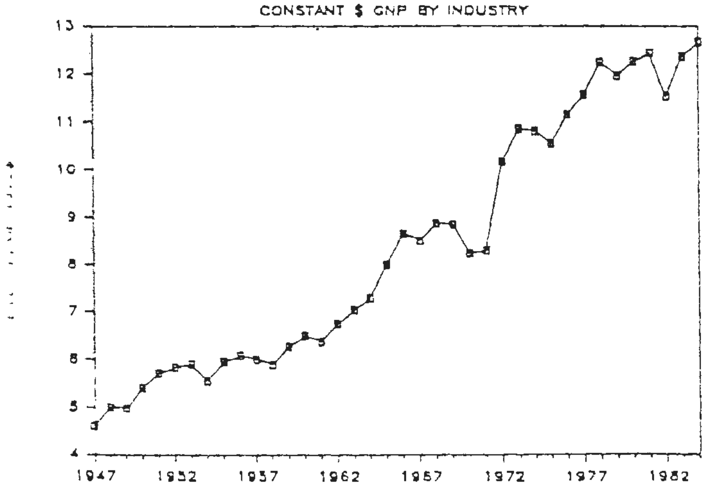
PRINTING & PUBLISHING

CONSTANT $ GNP BY INDUSTRY



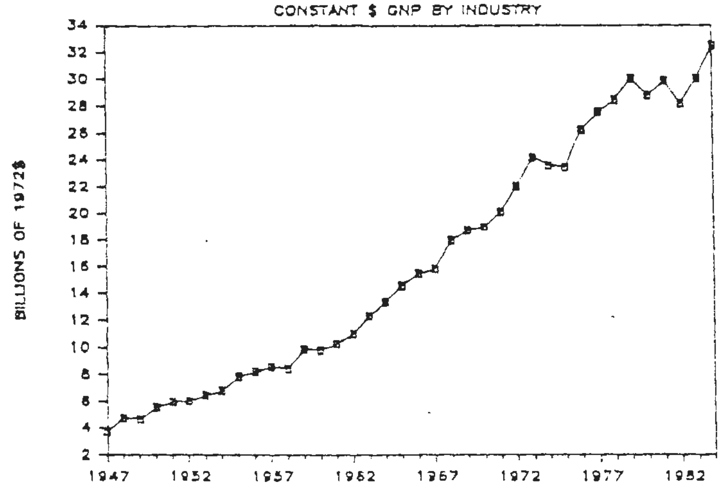
APPAREL & OTHER TEXTILE PRODUCTS

CONSTANT $ GNP BY INDUSTRY



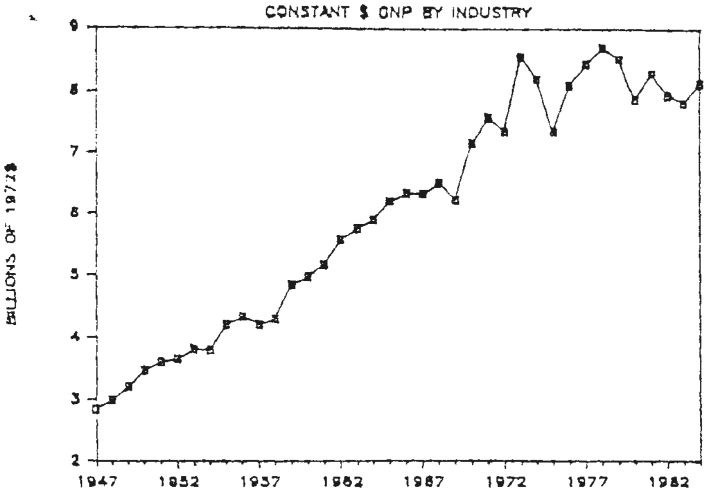
CHEMICALS & ALLIED PRODUCTS

CONSTANT $ GNP BY INDUSTRY



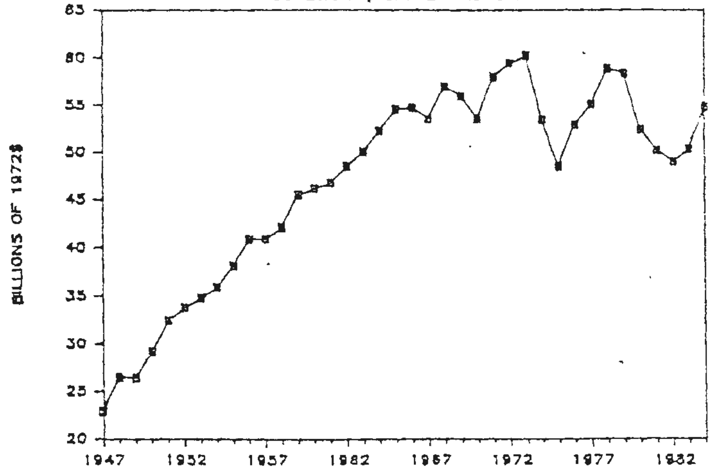
PETROLEUM & COAL PRODUCTS

CONSTANT $ GNP BY INDUSTRY



CONSTRUCTION

CONSTANT $ GNP BY INDUSTRY



RUBBER & MISC. PLASTIC PRODUCTS

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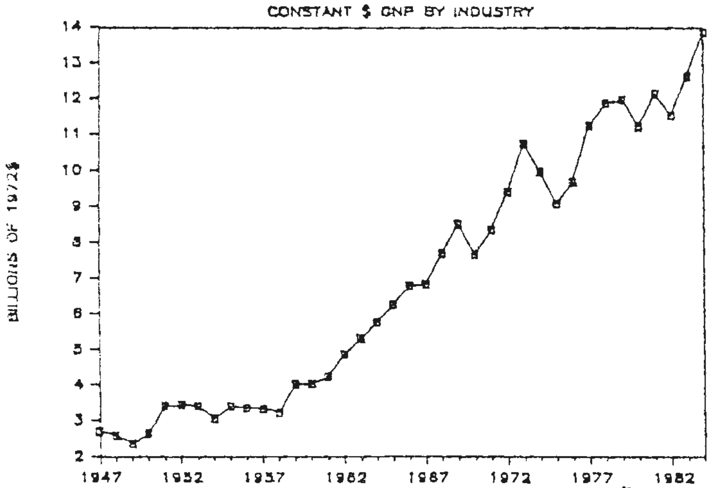
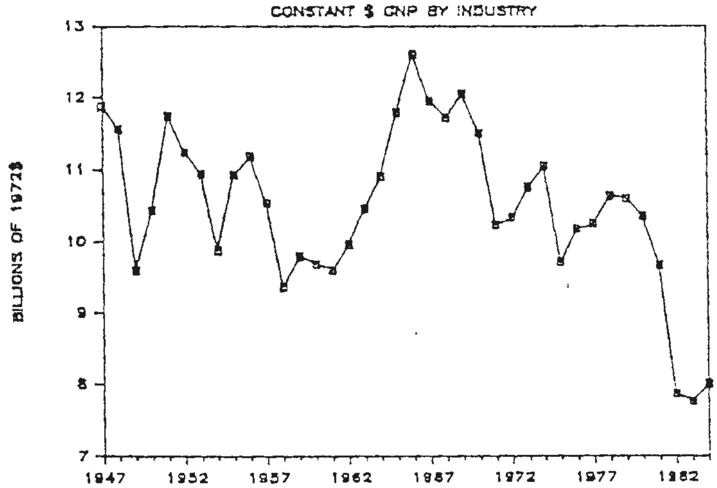


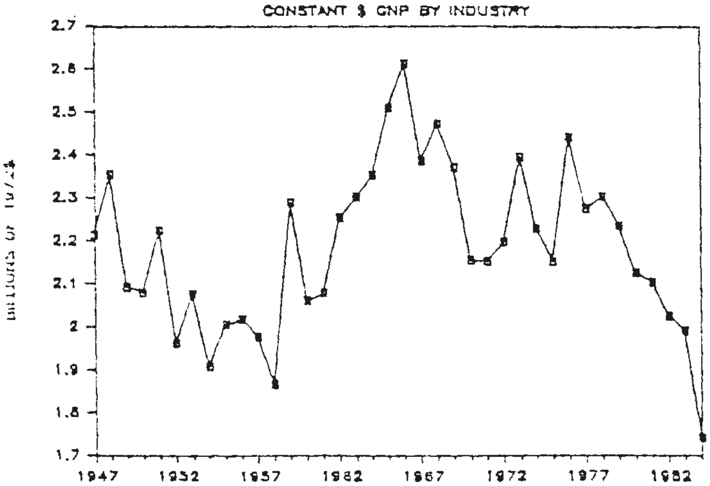
RAILROAD TRANSPORTATION

CONSTANT $ GNP BY INDUSTRY



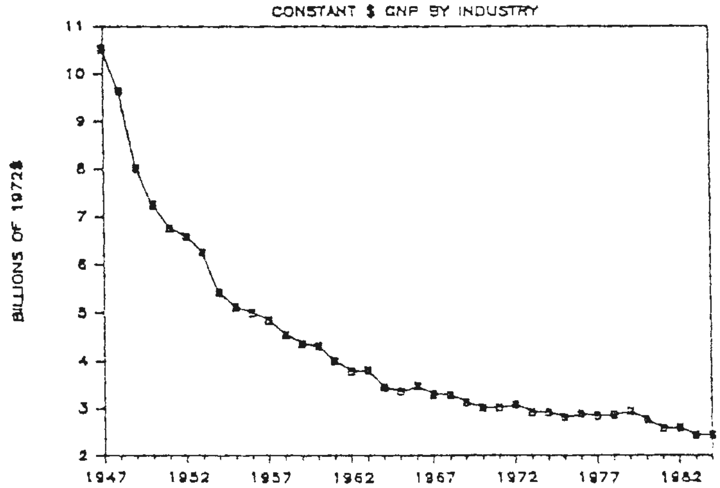
LEATHER & LEATHER PRODUCTS

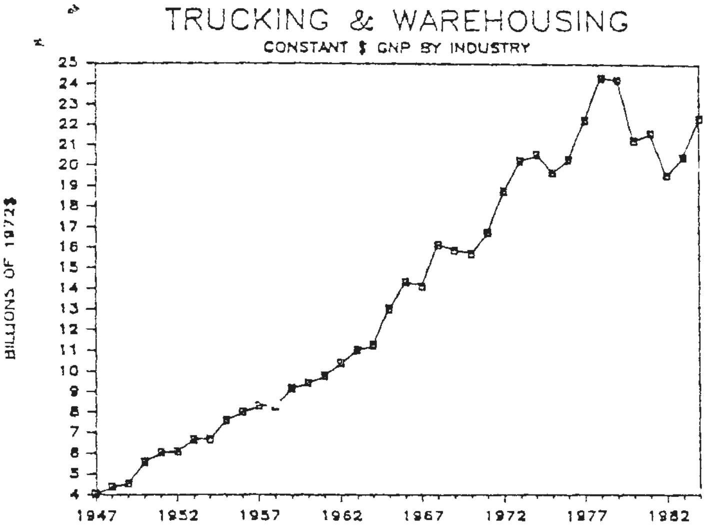
CONSTANT $ GNP BY INDUSTRY

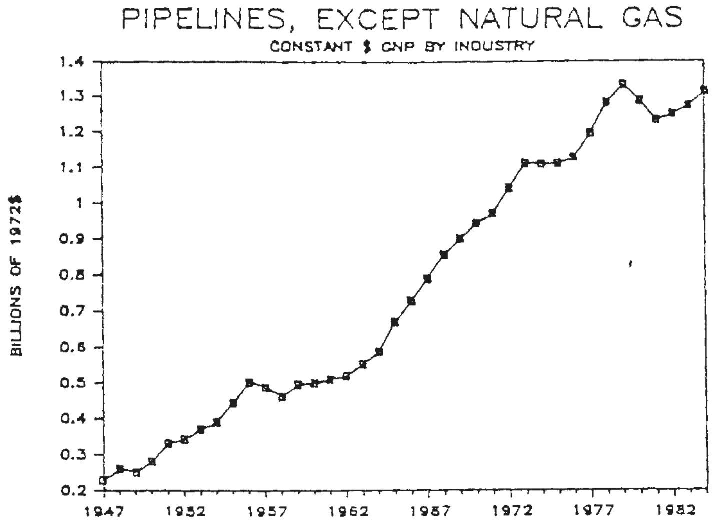


LOCAL & INTERURBAN TRANSIT

CONSTANT $ GNP BY INDUSTRY




TRUCKING & WAREHOUSING
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
1947 1952 1957 1962 1967 1972 1977 1982


PIPELINES, EXCEPT NATURAL GAS
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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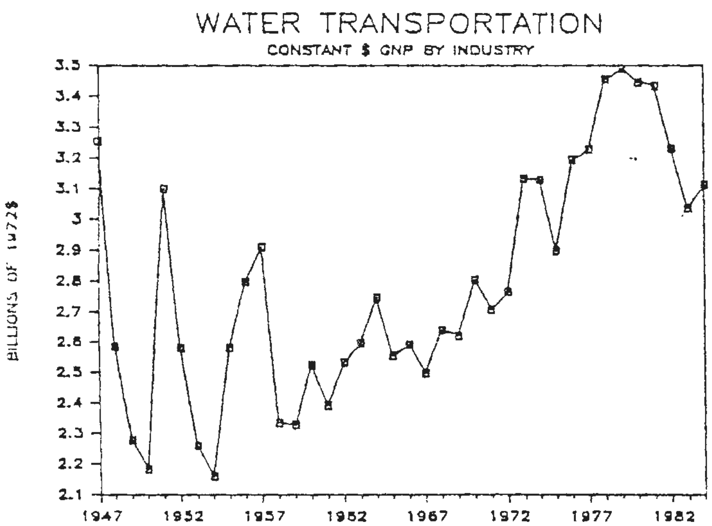
WATER TRANSPORTATION
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BILLIONS OF 1972$
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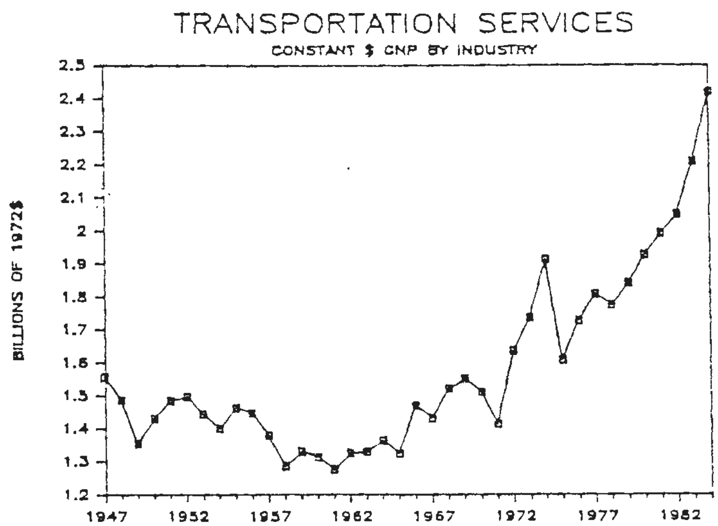
TRANSPORTATION SERVICES
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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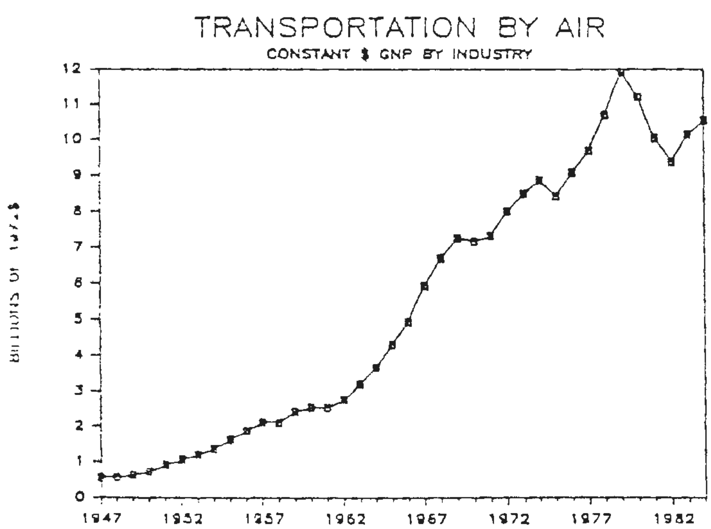
TRANSPORTATION BY AIR
CONSTANT $ GNP BY INDUSTRY
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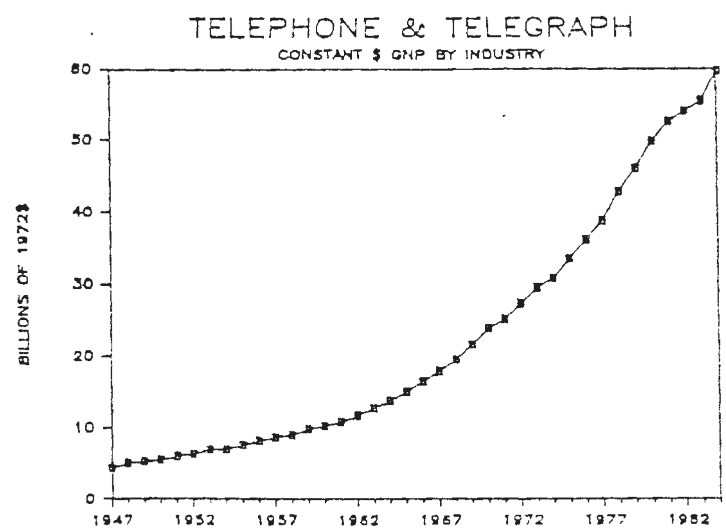
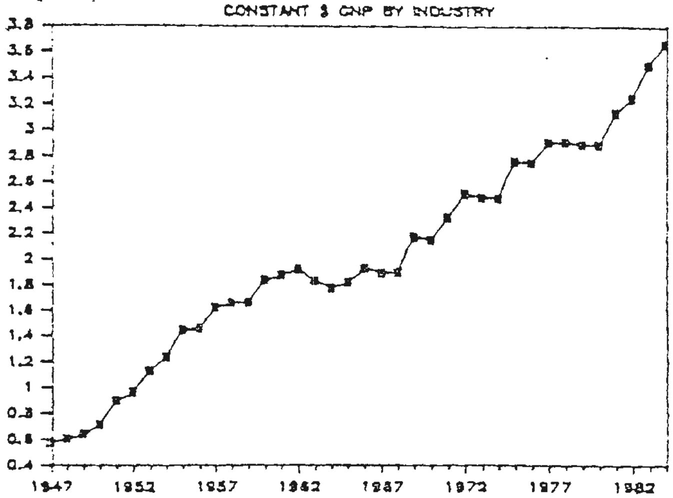

TELEPHONE & TELEGRAPH
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
1947 1952 1957 1962 1967 1972 1977 1982

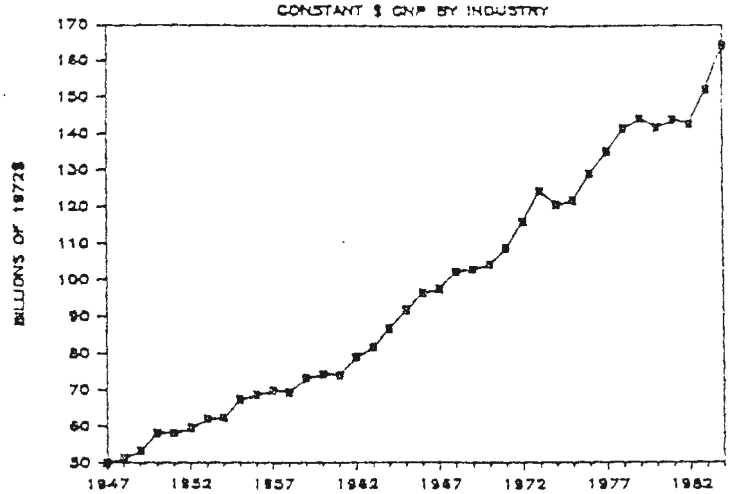
RADIO & TV BROADCASTING

CONSTANT $ GNP BY INDUSTRY



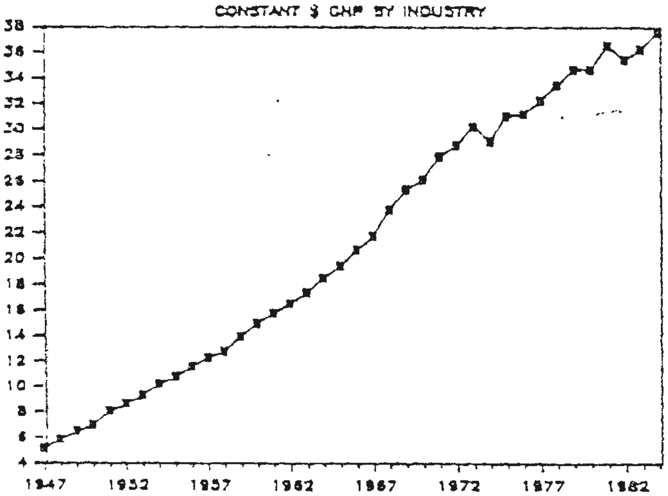
RETAIL TRADE

CONSTANT $ GNP BY INDUSTRY



ELEC, GAS & SANITRY SERV

CONSTANT $ GNP BY INDUSTRY



BANKING

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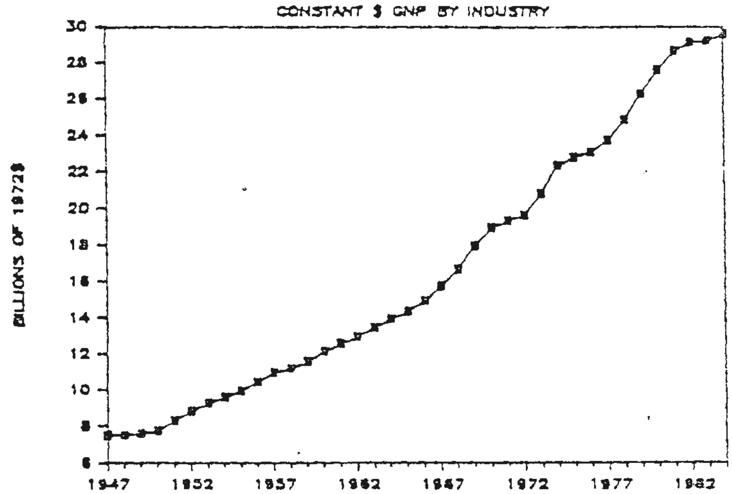

WHOLESALE TRADE

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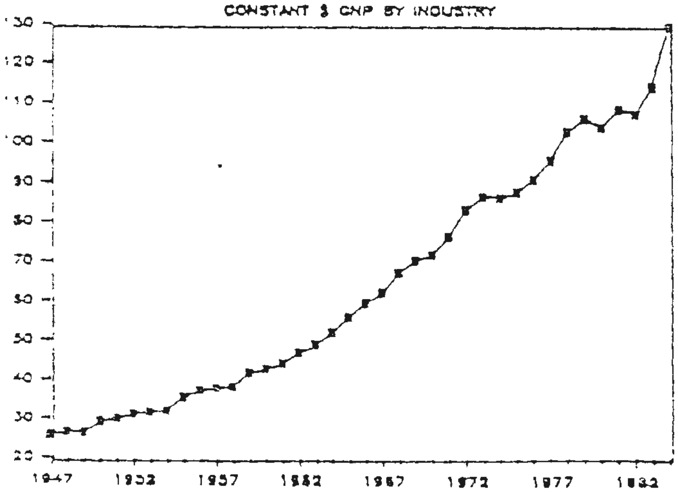
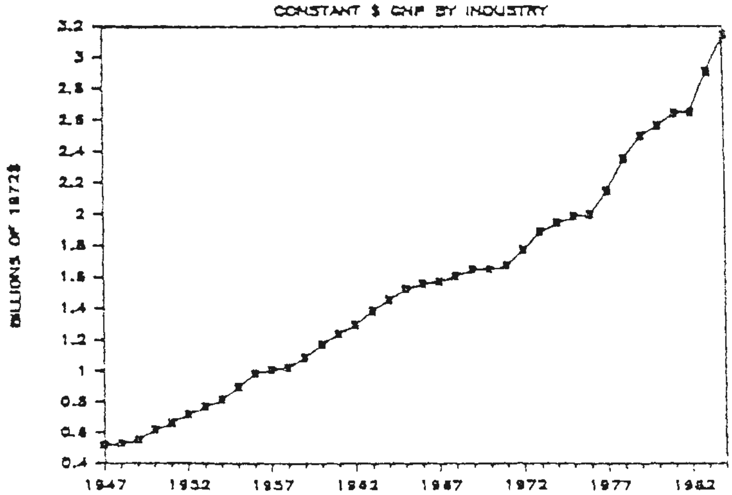
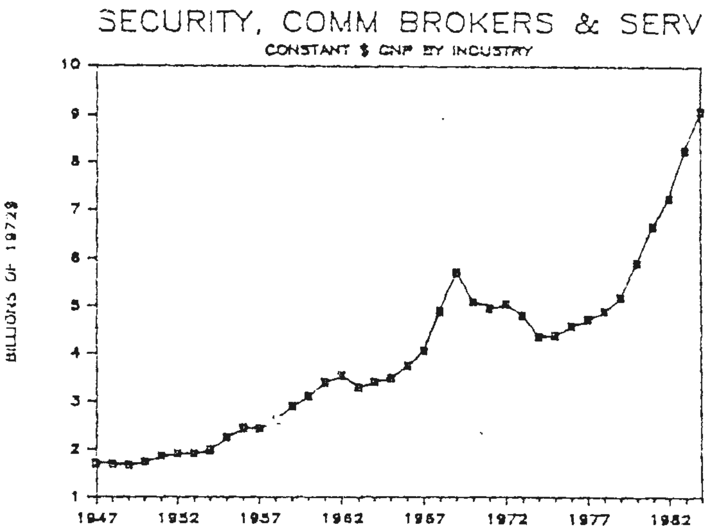


CREDIT AGENCY OTHR THAN BANKS

CONSTANT $ GNP BY INDUSTRY




SECURITY, COMM BROKERS & SERV
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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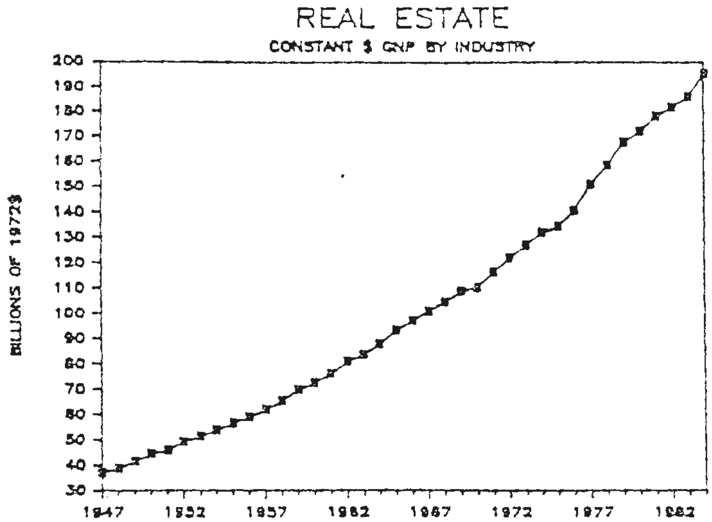
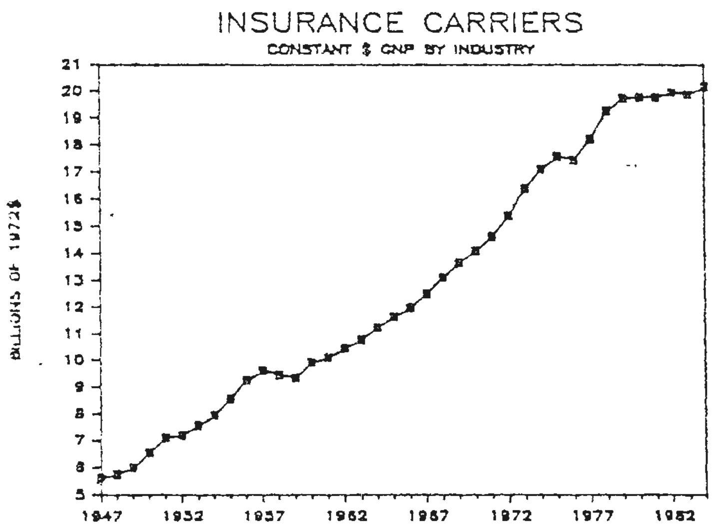

REAL ESTATE
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
1947 1952 1957 1962 1967 1972 1977 1982


INSURANCE CARRIERS
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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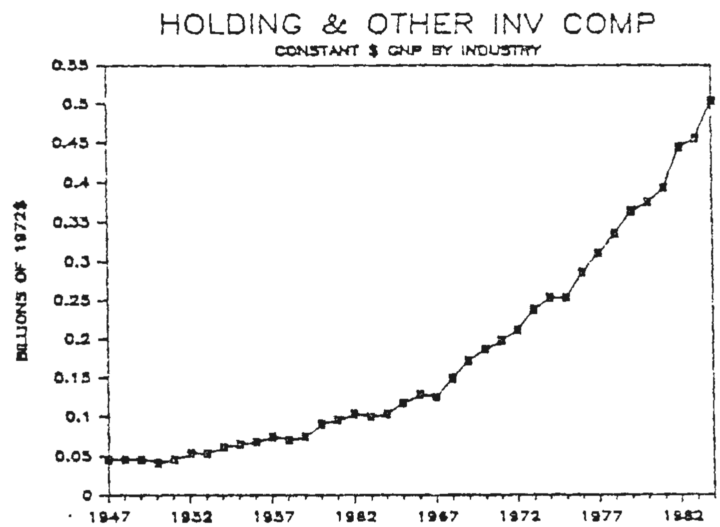
HOLDING & OTHER INV COMP
CONSTANT $ GNP BY INDUSTRY
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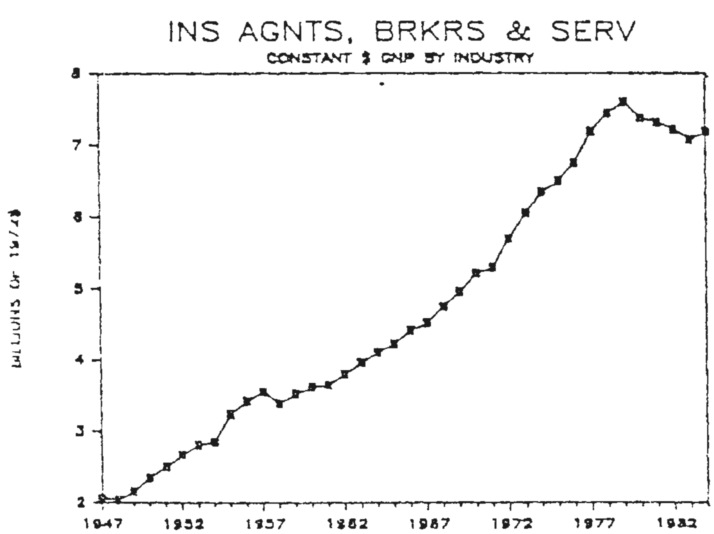
INS AGNTS, BRKRS & SERV
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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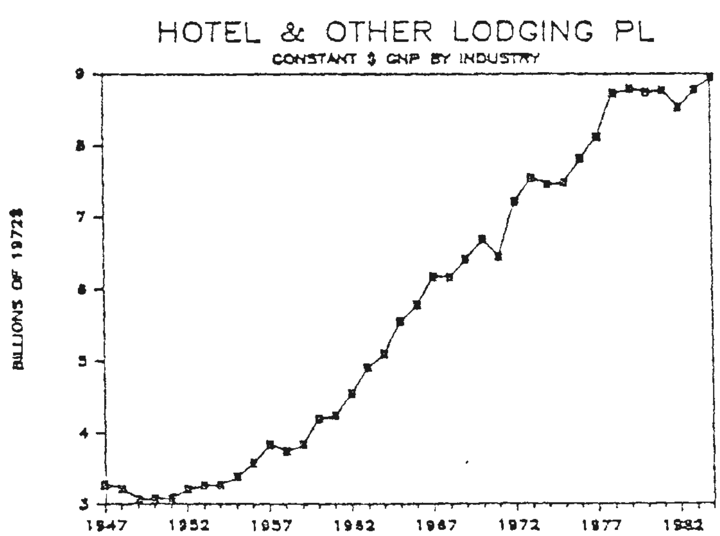
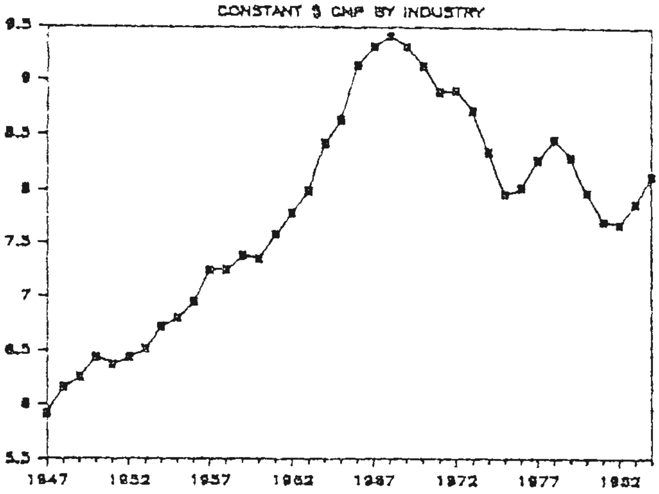
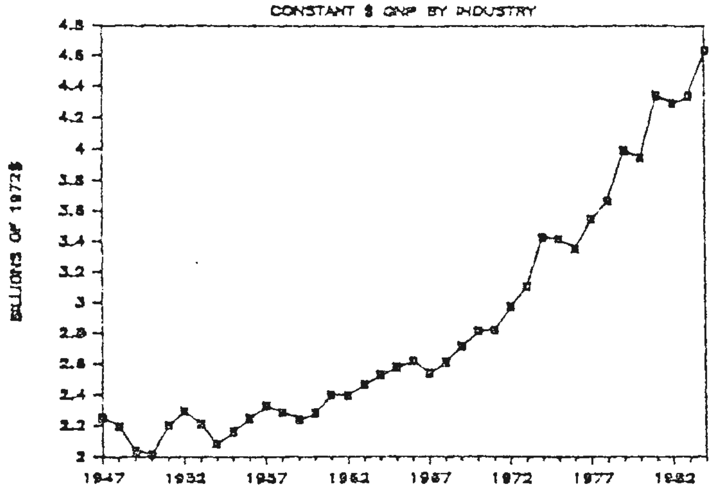

HOTEL & OTHER LODGING PL
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
1947 1952 1957 1962 1967 1972 1977 1982

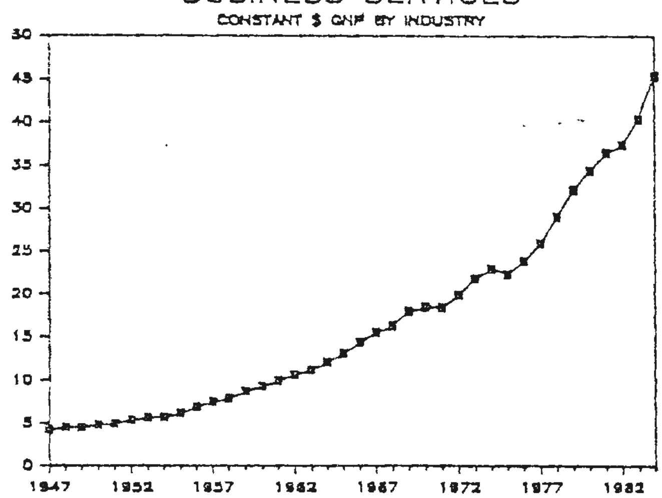
PERSONAL SERVICES



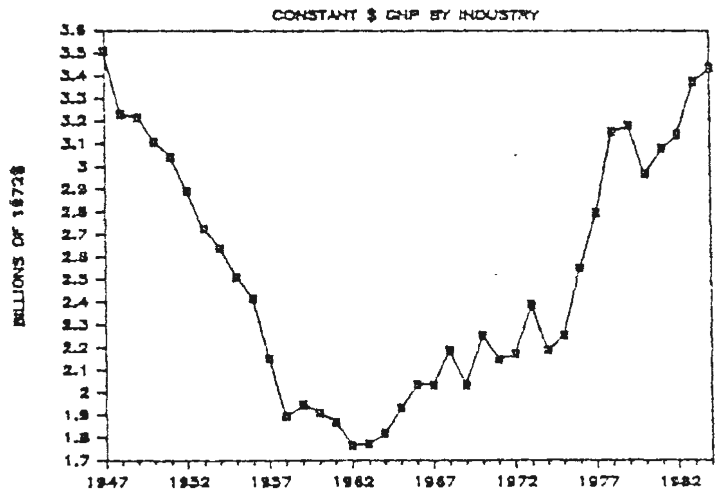
MISC REPAIR SERVICES



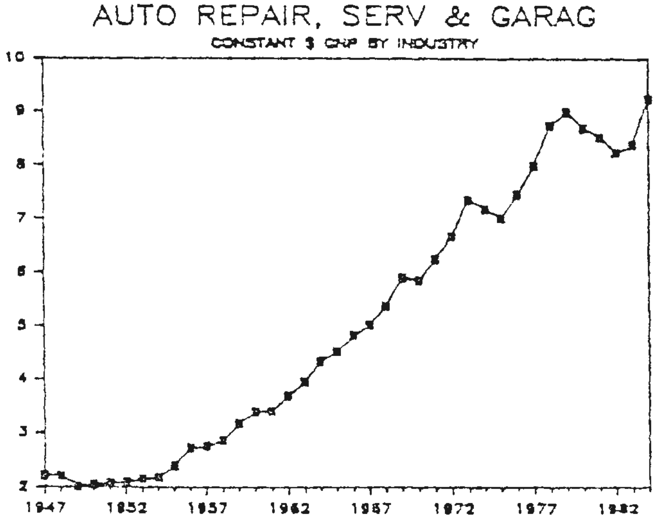
BUSINESS SERVICES



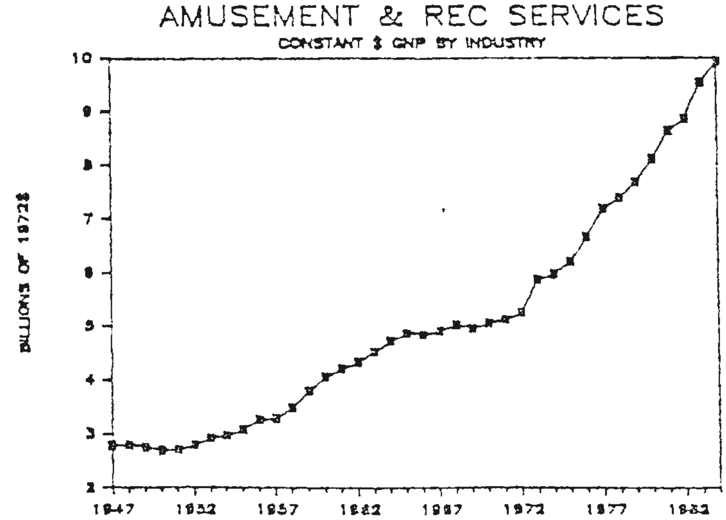
MOTION PICTURES

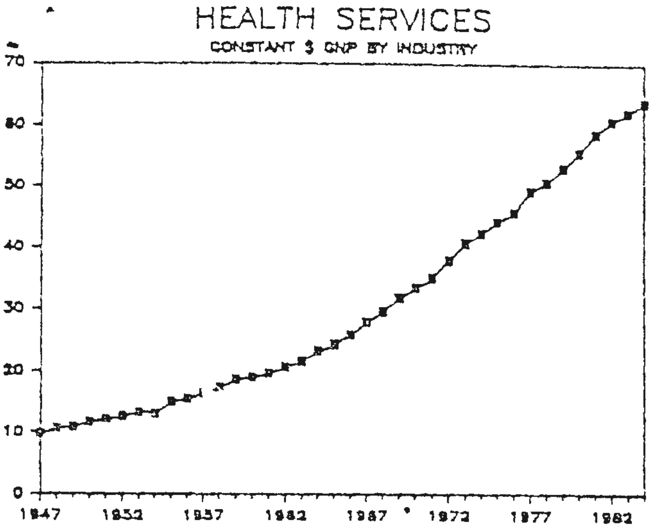


AUTO REPAIR, SERV & GARAG



AMUSEMENT & REC SERVICES




HEALTH SERVICES
CONSTANT $ GNP BY INDUSTRY
0 10 20 30 40 50 60 70
1947 1952 1957 1962 1967 1972 1977 1982


SOCIAL SERV & MEMBERSHIP ORG
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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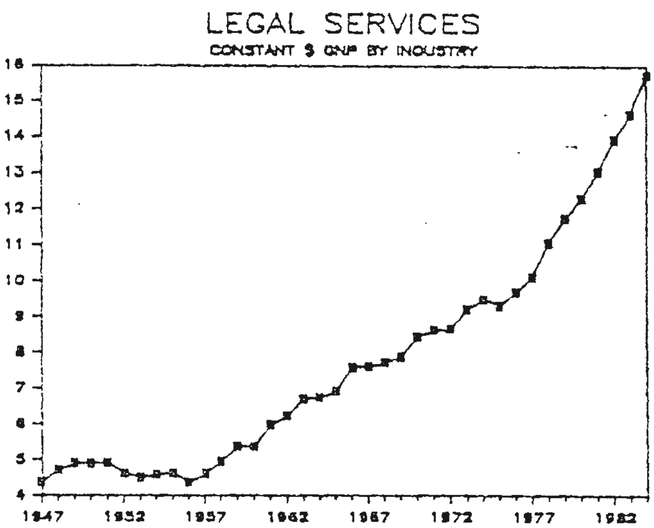
1947 1952 1957 1962 1967 1972 1977 1982


LEGAL SERVICES
CONSTANT $ GNP BY INDUSTRY
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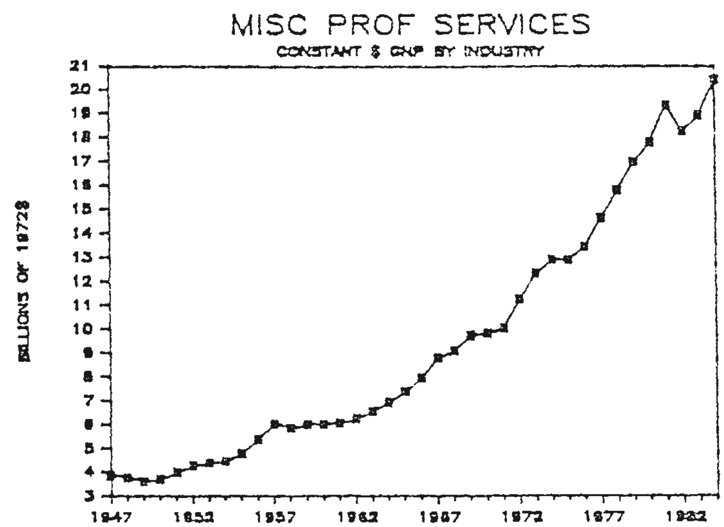
MISC PROF SERVICES
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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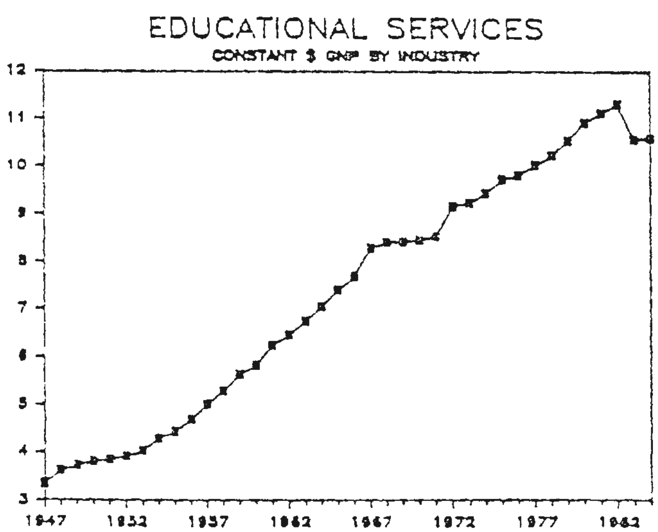
1947 1952 1957 1962 1967 1972 1977 1982


EDUCATIONAL SERVICES
CONSTANT $ GNP BY INDUSTRY
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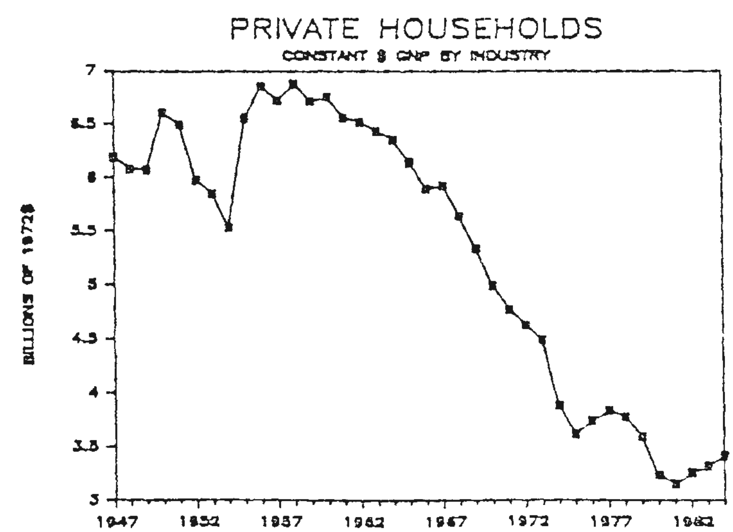
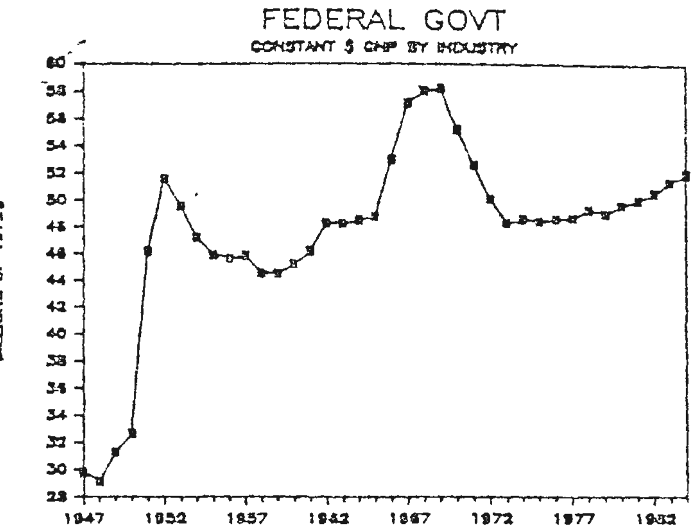

PRIVATE HOUSEHOLDS
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
3 3.5 4 4.5 5 5.5 6 6.5 7
1947 1952 1957 1962 1967 1972 1977 1982


FEDERAL GOVT
CONSTANT $ GNP BY INDUSTRY
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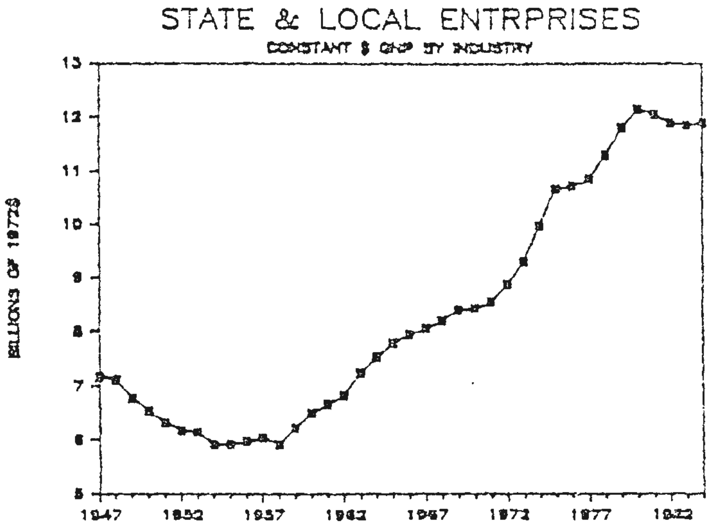
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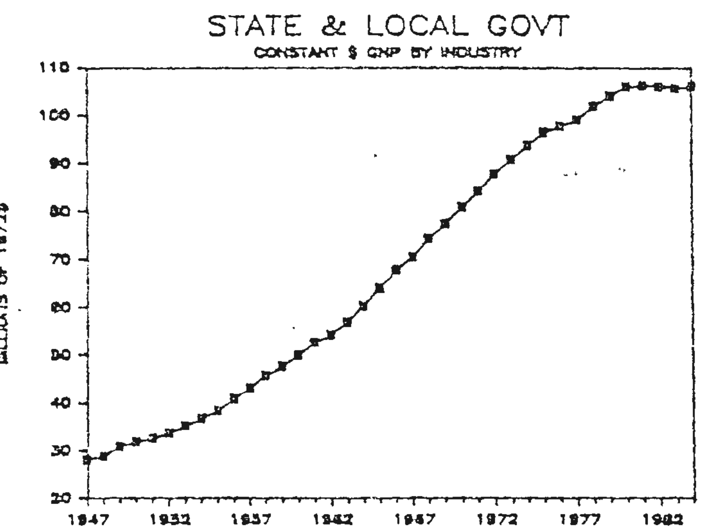
STATE & LOCAL GOVT
CONSTANT $ GNP BY INDUSTRY
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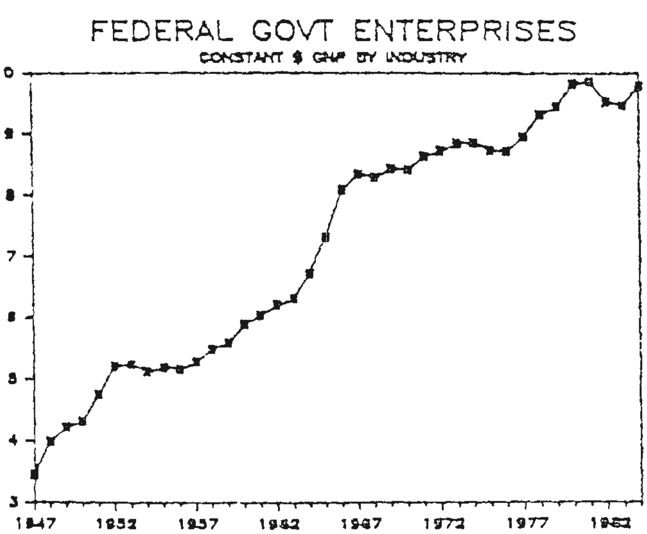
REST OF WORLD
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
1947 1952 1957 1962 1967 1972 1977 1982


FEDERAL GOVT ENTERPRISES
CONSTANT $ GNP BY INDUSTRY
1947 1952 1957 1962 1967 1972 1977 1982

EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL OF ECONOMIC ADVISERS

July 16, 1985

Dr. Sprinkel ✓
Dr. Moore
Joe Stone

Attached for your information are informal notes from the July 15 trade meeting.

Margot Machol

108-8-7
Sprinkle
OA17744
Folder #2

Beryl W. Sprinkel
Chairman

THE WHITE HOUSE

WASHINGTON

July 12, 1985

MEMORANDUM FOR ALFRED H. KINGON
W. ALLEN WALLIS
DANIEL G. AMSTUTZ
MICHAEL B. SMITH
BRUCE W. SMART
DAVID C. MULFORD
DOUGLAS W. McMINN
THOMAS KAY
ROBERT CORNELL

FROM: ROGER B. PORTER RBP

SUBJECT: Deindustrialization

At the trade policy meeting on July 2, the Council of Economic Advisers agreed to review the literature and prepare a paper on "Is the U.S. Economy Undergoing 'Deindustrialization'."

A copy of this paper is attached.

Attachment

cc: Beryl W. Sprinkel

July 11, 1985

Is the United States Undergoing "Deindustrialization"?

The public perception that the U.S. economy is undergoing "deindustrialization" is widespread and has grown substantially in recent years. Many apparently believe that the tradable goods sector, especially manufacturing, is in decline due both to inappropriate policies here at home (the tight money-large budget deficit-strong dollar argument) and to unfair trading practices among our trading partners. Thus, it is claimed, industry is expanding abroad at the expense of industry in the United States. This paper examines whether such arguments are valid.

Deindustrialization presumably refers to a persistent decline in the productive capacity of the manufacturing sector. However, the term is also sometimes used to refer to the goods-producing sector in general, which includes agriculture and mining as well as manufacturing. Productive capacity itself is not directly observed, but is the result of investments in capital stock, employment and other inputs, and the technology of production. Over long periods of time, where one can abstract from demand conditions, actual output is the best measure of trends in productive capacity. Over shorter periods, trends in the capital stock can also be used if the rate of technological change is low. Trends in employment are generally a poor measure of trends in productive capacity -- in the short run because of cyclical variations in demand, and in the longer run because of changes in technology.

In subsequent sections we describe and evaluate trends in major sectors of the economy, compare U.S. economic performance overall and in manufacturing to the performance of other countries, and summarize and evaluate exceptional trends in detailed industries.

Trends in Major Sectors

Analysis of recent and longer-term trends in the total, goods-producing, and manufacturing sectors of the U.S. economy suggests the following conclusions:

1) The average annual rate of growth for manufacturing output from 1947-84 is exactly the same as for total real gross domestic product (GDP) -- 3.4 percent (see Table 1). For the more recent period from 1980-84, manufacturing output has continued to grow at about the same rate as total real GDP (2.7 versus 2.8 percent).

Table 1

Real Growth in Gross Domestic Product by Industry
(Percent Average Rate of Growth over Period)

	1950s(1)	1960s	1970s	1980s(2)	1947 to 1984
Gross Domestic Product(3)	3.2	3.9	3.0	2.8	3.4
Private	3.3	4.0	3.3	3.1	3.5
Goods	2.4	3.8	2.8	2.7	3.0
Agriculture	0.9	0.7	1.5	3.1	1.5
Mining	2.0	3.4	1.3	0.9	2.0
Manufacturing	2.7	4.3	3.0	2.7	3.4
Durable	2.6	4.4	3.1	3.2	3.4
Non-Durable	2.9	4.1	2.9	2.1	3.3
Construction	4.7	1.5	-0.2	1.2	2.4
Services					
Capital Intensive(4)	3.4	5.1	3.9	2.0	3.5
Trade	3.0	4.2	3.4	4.6	3.7
Wholesale	3.9	5.3	3.8	5.6	4.4
Retail	2.5	3.4	3.1	3.8	3.3
FIRE(5)	4.9	4.3	4.2	3.0	4.4
Other Services	3.4	4.3	4.1	3.7	3.8
Government	3.6	3.6	1.5	0.3	2.6
Rest of the World	5.7	4.4	12.4	-6.5	5.7

(1) Decade Averages
(2) 1980-1984
(3) Also includes statistical discrepancy and the residual between income and product measures.
(4) Transportation and Public Utilities (including Communications)
(5) Finance, Insurance and Real Estate

2) The average annual rate of growth for the goods-producing sector as a whole (manufacturing plus agriculture and mining) from 1947 to 1984 is somewhat less than for real GDP (3.0 percent versus 3.4 percent), but this reflects lower growth in agriculture and mining rather than in manufacturing (see Table 1). For the more recent period from 1980-84, however, the goods-producing sector grew almost as rapidly as real GDP (2.7 versus 2.8 percent), due primarily to an increase in the rate of growth of agriculture to more than double the rate in the prior three decades.

3) Productivity growth in manufacturing (average labor productivity) substantially exceeds that of the economy as a whole (2.7 percent versus 1.2 percent for 1980-84), and this has been increasingly true in recent decades (see Table 2).

   o The explanation lies both in greater rates of technological change and in shifts to more capital-intensive industries and techniques. Part of the explanation for the shift to more sophisticated, capital-intensive techniques and industries lies in the dynamic adjustment of the U.S. economy to increased competition from abroad in more labor-intensive areas.

   o The result of greater productivity growth in manufacturing (together with the similarity of manufacturing output growth and total output growth) is that manufacturing employment has expanded less rapidly than total employment in each of the last four decades (see Table 3).

4) Cyclical fluctuations in the goods-producing and manufacturing sectors are exaggerated relative to the economy as a whole. This well-known attribute of these sectors is easily demonstrated for the 1980-84 period and largely explains their performance during this period.

Table 2

Productivity Growth by Industry
(Growth in Ratio of Real Value Added vs
Number of Full Time Equivalent Employees)

	.......Annual Rate of Change......			
	1950s	1960s	1970s	1980s
Gross Domestic Product	2.2	1.6	1.1	1.2
Private	2.6	1.9	1.2	1.2
Goods	2.8	2.7	2.0	2.4
Agriculture	2.2	4.2	-0.1	0.2
Mining	5.7	4.8	-2.8	0.5
Manufacturing	2.9	2.8	2.5	2.7
Construction	3.0	-0.2	-1.6	0.3
Services				
Capital Intens.	3.7	4.2	2.8	1.2
Trade				
Wholesale	2.8	3.2	1.3	1.7
Retail	1.5	0.6	0.4	0.8
FIRE	1.2	1.1	0.6	-0.1
Other	1.2	0.6	0.3	0.2
Government	0.0	0.3	0.4	0.4

Note: See previous Table forFootnotes

Table 3

Growth in Full-Time Equivalent Employment

(Average Annual Rate in Percent

	1950s	1960s	1970s	1980s	1947 to 1984
Total, wage and salary workers in nonagricultural establishments	1.5	2.3	2.0	1.0	1.7
Manufacturing	.8	1.5	.4	-.2	.6

Source: Department of Labor, Bureau of Labor Statistics.

- o With respect to output, Figure 1(a) illustrates that the most recent recession was substantially more severe than the average and Figure 1(b) that the subsequent recovery was exceptionally strong. The result was an even lower trough for the goods-producing sector (see Figure 2(a)) and an even stronger recovery (see Figure 2(b)). Similar effects are seen for manufacturing in Figures 3(a) and 3(b). Another few quarters are required before the full extent of the current recovery can be assessed.

- o With respect to employment, a similar phenomenon is observed. Figure 4(a) illustrates that total employment declined more than in the average recovery and Figure 4(b) that total employment growth was more rapid than average during the recovery. The even more exaggerated decline in goods-producing employment is presented in Figure 5(a), and Figure 5(b) depicts the exceptionally rapid increase in employment during the recovery. A similar pattern is observed for manufacturing employment in Figures 6(a) and 6(b). The slight downturn of employment in the first-quarter of 1985 is most likely the result of virtually zero growth overall in the first quarter.

<u>International Comparisons</u>

Comparisons of U.S. economic performance overall and in manufacturing to the performance by other countries provide an even more optimistic assessment of the deindustrialization issue and lead to the following major conclusions:

1) The U.S. economy would be in an even stronger position (especially manufacturing) if the rest of the economies of the rest of the world were performing better. ~~In the 1980-84 period, rest of world economic growth was strongly negative, an average annual rate of -6.5 percent (see Table 1).~~ Despite the relative poor performances by many of our trading partners, U.S. economic growth during the period was 2.8 percent overall and 2.7 percent in manufacturing.

GROSS NATIONAL PRODUCT

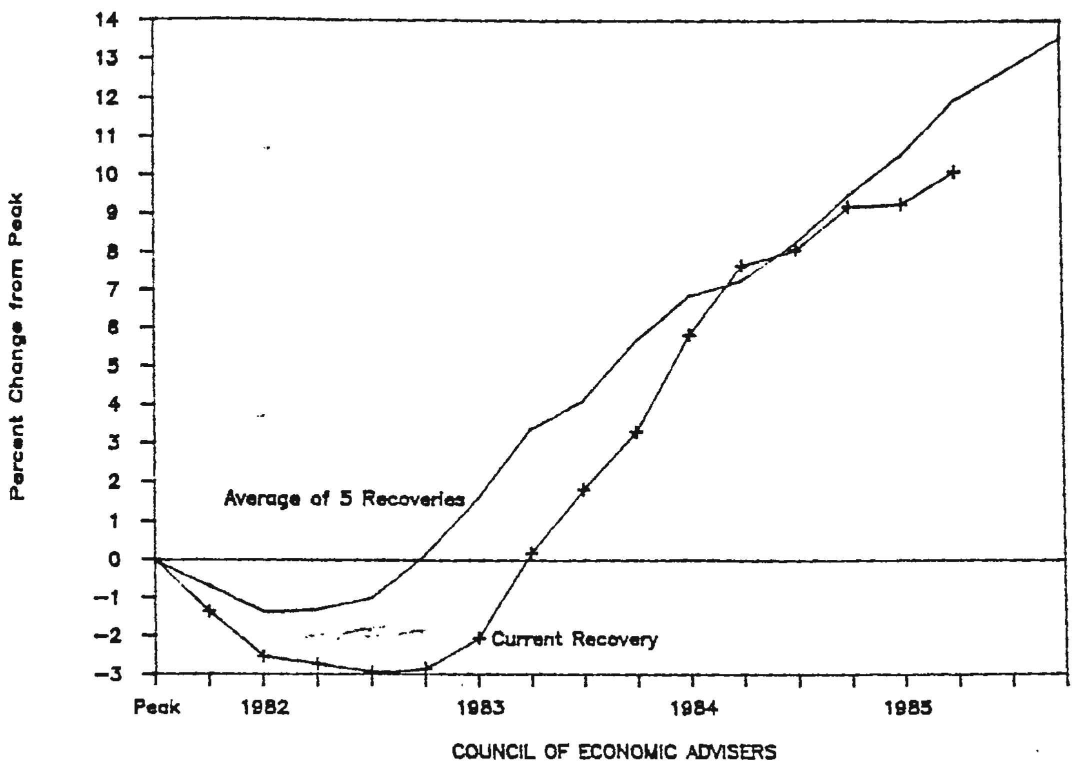


Figure 1(a)

GROSS NATIONAL PRODUCT

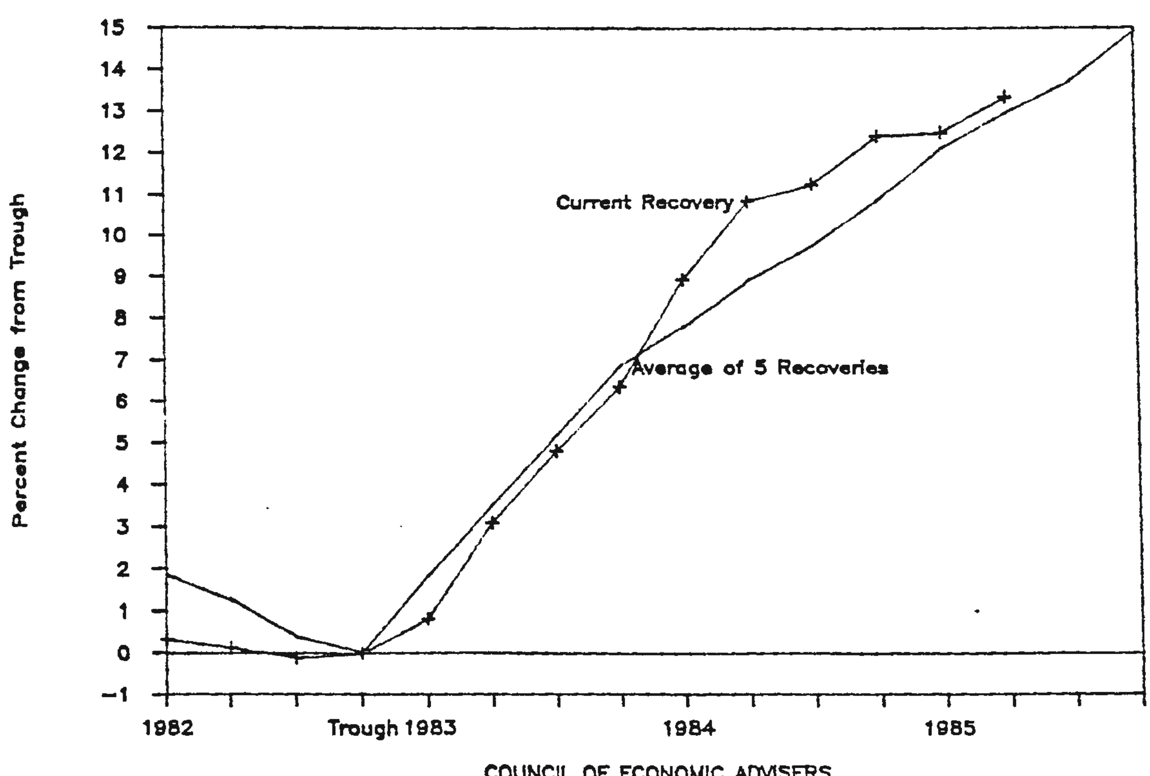


Figure 1(b)

GROSS NATIONAL PRODUCT -- GOODS

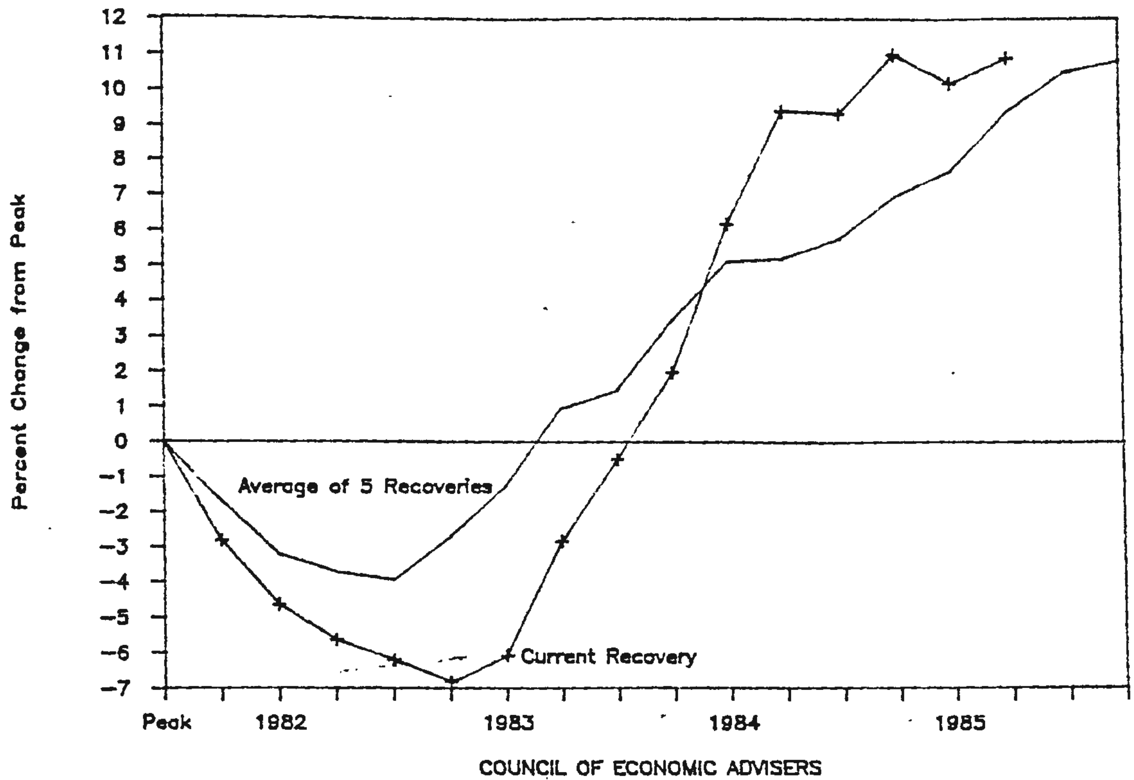


Figure 2(a)

GROSS NATIONAL PRODUCT -- GOODS

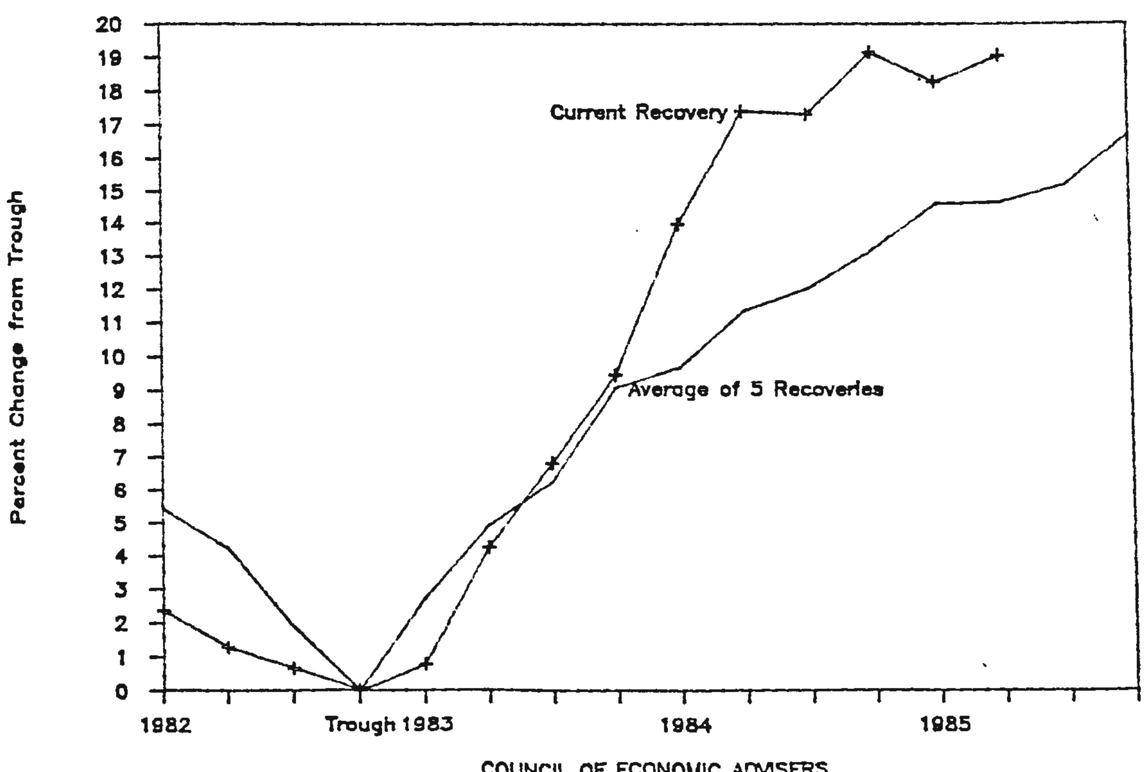


Figure 2(b)

INDUSTRIAL PRODUCTION -- MANUFACTURING

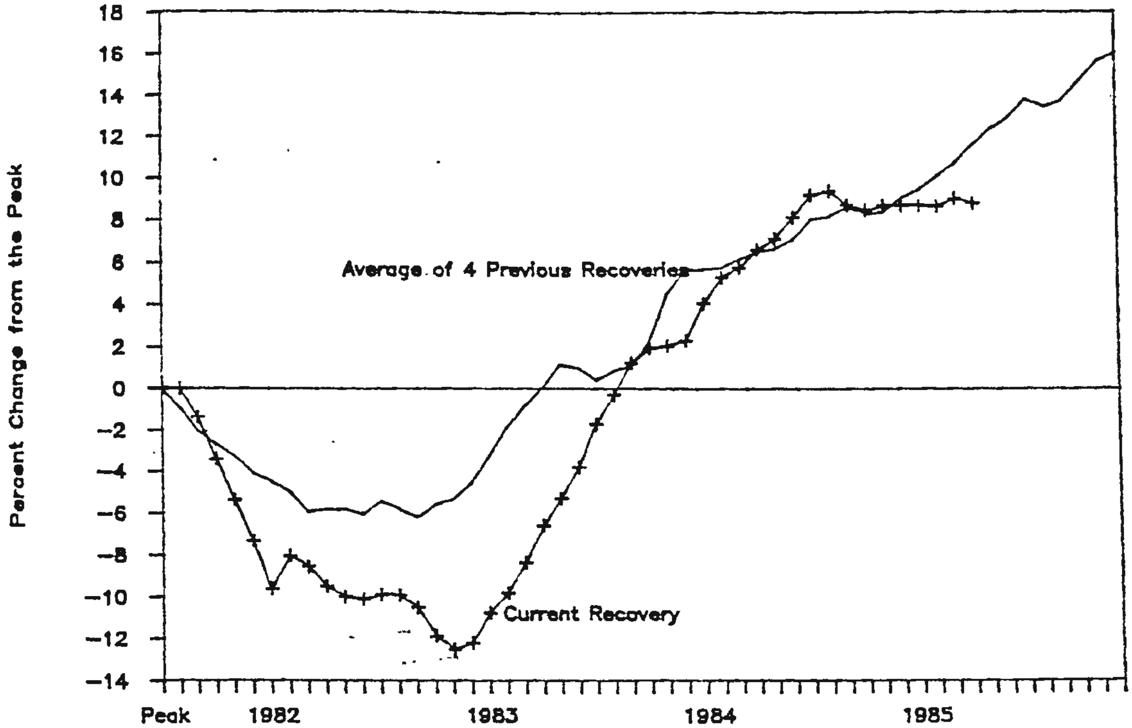


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Figure 3(a)

INDUSTRIAL PRODUCTION -- MANUFACTURING

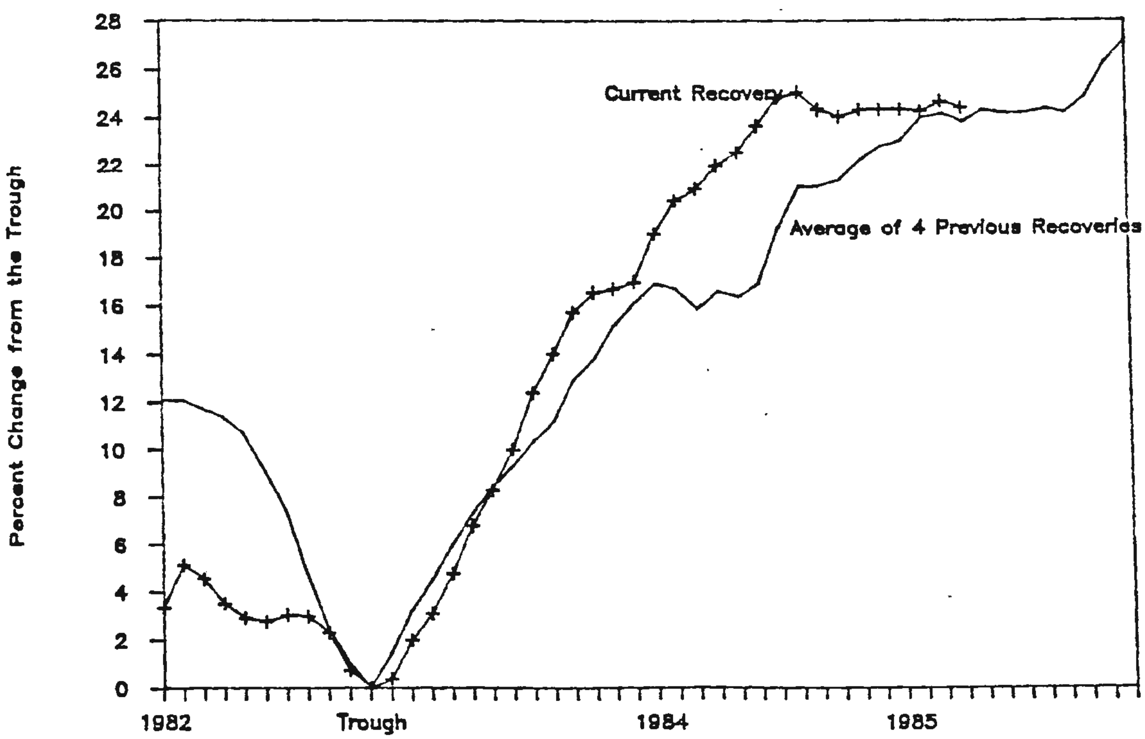

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Figure 3(b)

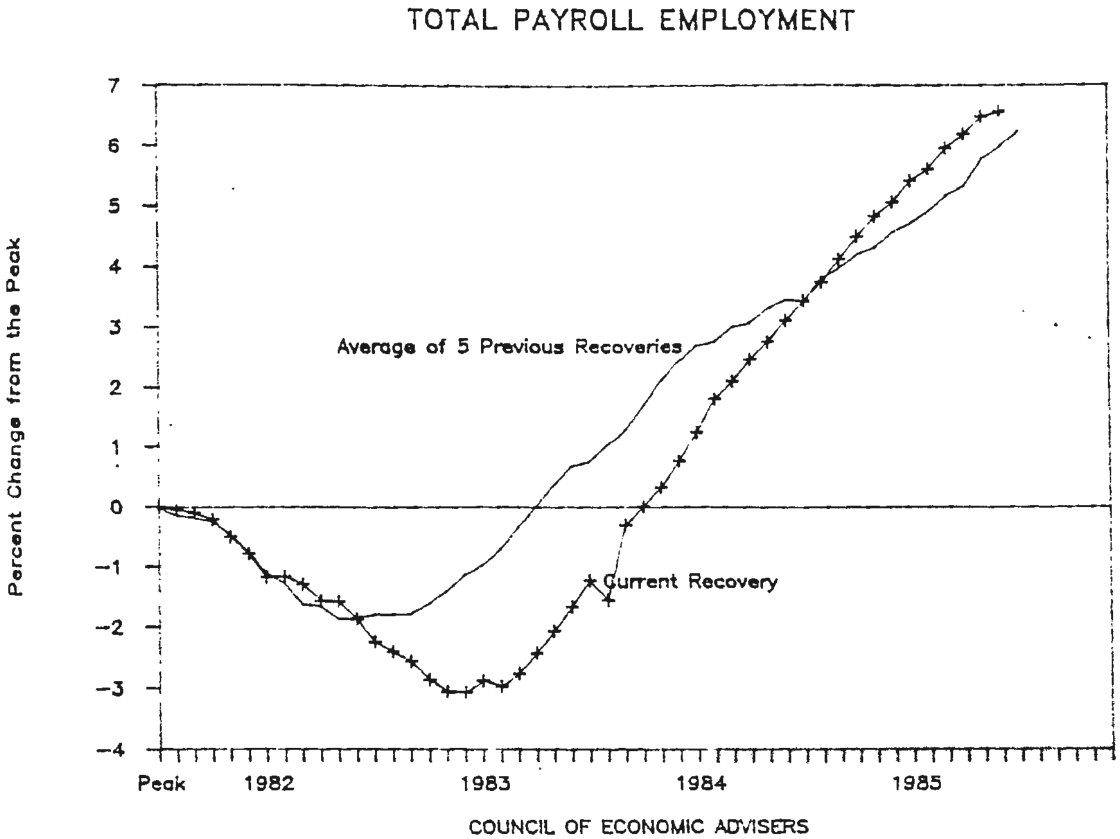


Figure 4(a)

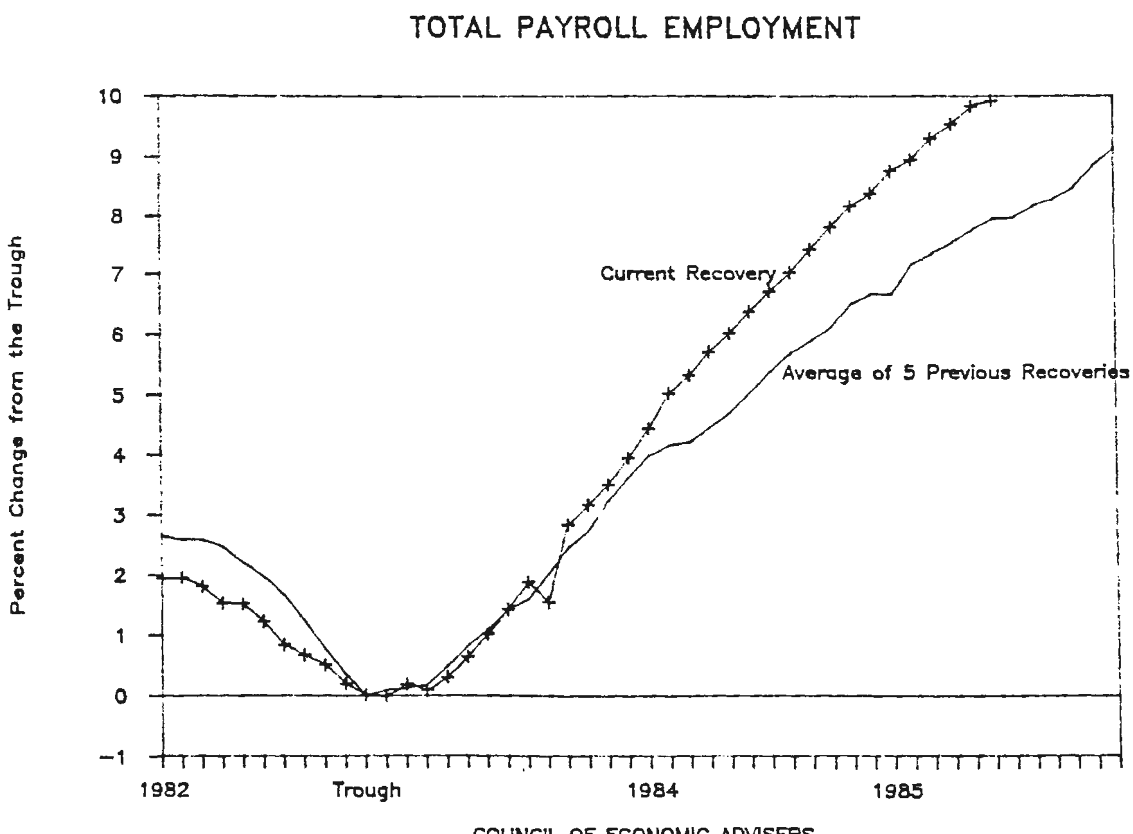


Figure 4(b)

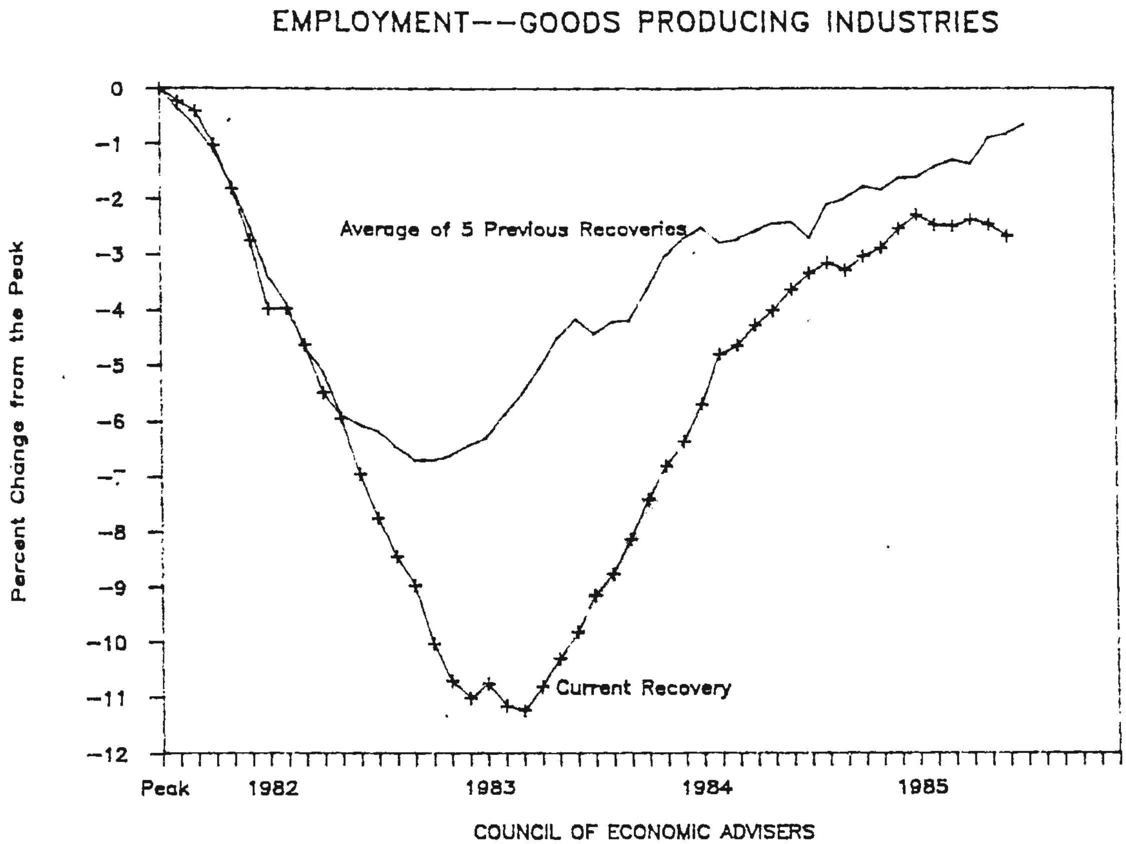


Figure 5(a)

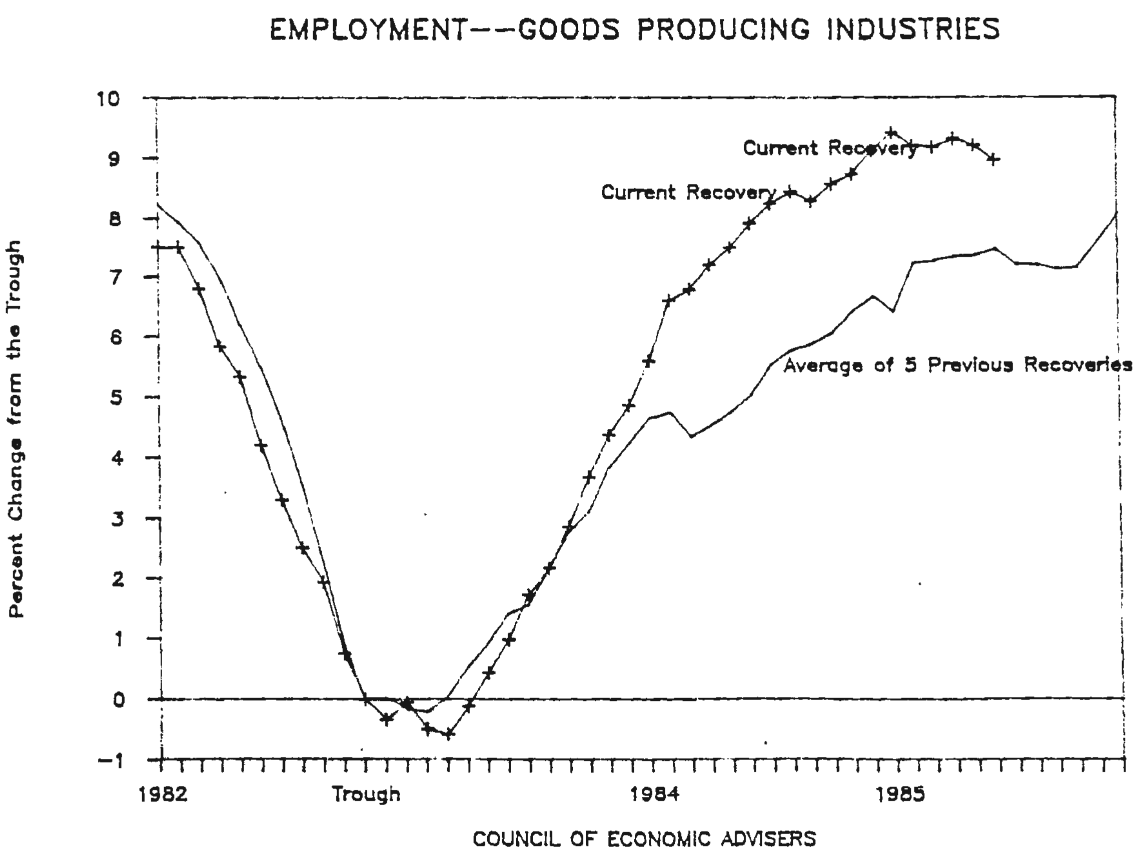


Figure 5(b)

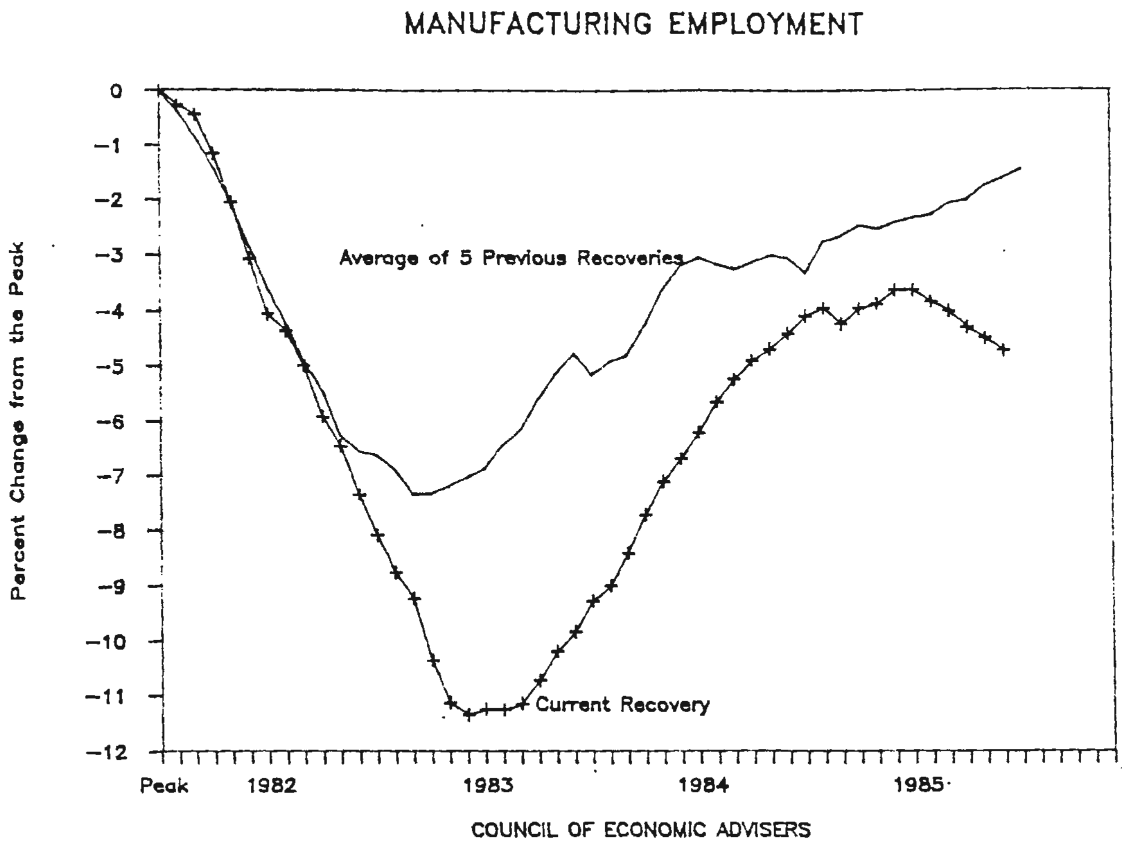


Figure 6(a)

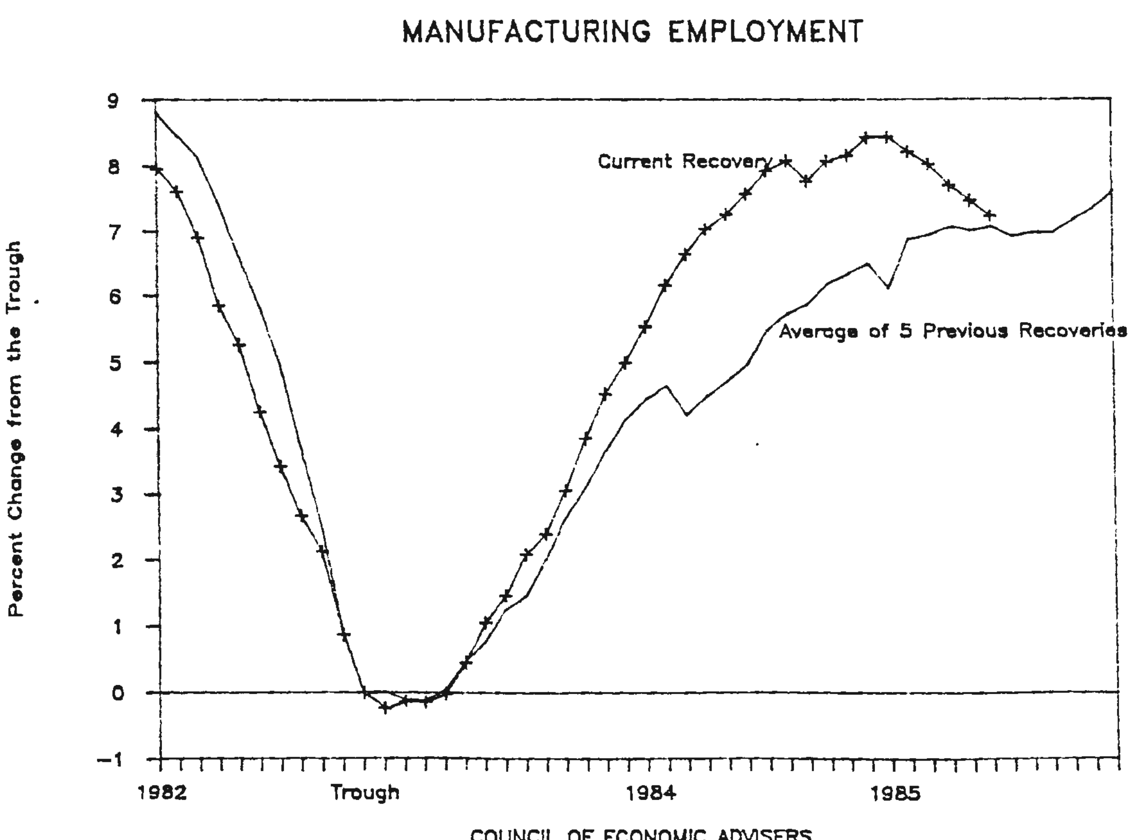


Figure (6b)

2) It is not true that most of our major international competitors have expanded manufacturing output at a faster rate than the United States. Table 4 indicates that U.S. manufacturing production, as measured by industrial production, grew at an annual rate of 2.9 percent from 1980-84, almost twice the average of all OECD countries. Only Japan (with an annual rate of 3.9 percent) stands out as having a distinctly stronger performance by manufacturing. Reflecting the cyclical volatility of manufacturing, growth in manufacturing production in OECD countries was significantly below growth in total production. This is not the case for the United States.

3) Growth in the U.S. manufacturing capital stock for recent years (1979-82) is substantially above the growth rates for most of our industrialized trading partners (see Table 5). The average annual rate is 4.1 for the United States, well above the rates for France, Germany, the United Kingdom, Sweden, Austria, and others. Less precise data based on capacity output (real output divided by average capacity utilization rate) show an even more marked divergence for the period from 1979 through last year (see Table 6). U.S. capacity output in manufacturing grew at an annual rate of 2.5 percent, more than twice the rate for most of our industrialized trading partners.

Table 4

Output Growth in Major Industrial Economies 1960 to 1984

(Average annual rates of change in percent)

	USA		GERMANY		FRANCE		JAPAN		UNITED KINGDOM		OECD	
	GDP	Manufacturing production	GDP	Manufacturing production	GDP	Manufacturing production	GDP	Manufacturing production	GDP	Manufacturing production	GDP	Manufacturing production
1960-1973	4.0	5.4	4.5	5.2	5.6	5.0	10.5	12.5	3.1	3.0	5.0	6.0
1973-1980	2.3	1.8	2.3	1.1	2.7	1.3	3.6	2.9	0.9	-2.2	2.5	1.7
1980-1984	2.5	2.9	.6	-.1	1.2	-1.0	4.0	3.9	1.5	.7	2.0	1.5

Notes.-- Due to various adjustments figures may differ from those from national sources. Manufacturing production is measured by industrial output.

Source: OECD.

Table 5

Changes in capital stock of total manufacturing
(Average annual rates of growth)

	1969-1973	1973-1979	1979-1982
Austria	6.0	3.4	2.7
Finland	6.2	4.0	3.1
France	6.5	4.1	2.8
Germany, Fed. Rep. of	6.0	2.3	1.8
Norway	4.1	4.8	3.3
Sweden	4.4	3.7	2.1
United Kingdom	3.2	2.1	0.6
Canada	4.7	3.9	4.1
United States	2.7	3.8	4.1

Source: OECD

Table 6

Changes in capacity output[a] in manufacturing
(Average annual rates of growth)

Country	Annual average rates of growth 1969-1973	1973-1979	1979-1984
Austria	3.3	3.1	3.7
Belgium	8.1	3.9	0.6
France	6.3	3.7	1.3
Germany, Fed.Rep. of	4.6	2.4	0.9
Italy	7.1	3.0	1.2
Netherlands	..	2.4	-1.0
Sweden	..	..	1.7
United Kingdom	2.7	-	-1.7
Canada	4.8	3.7	3.3
United States	3.6	3.1	2.5

Source: OECD

a. Capacity output is actual real output divided by average capacity utilization rate. Actual real output is the real value added of total manufacturing.

Trends in Detailed Industries

Sector aggregates clearly conceal varying industry detail within each sector. Appendix A disaggregates U.S. GNP in 1972$ to GNP by industry at the 2 digit level (65 industries). Appendix B shows real GNP over the postwar period in each of the 65 industries. A brief scan of these charts lead to the following general conclusions.

1) As suggested above, manufacturing industry output is subject to greater cyclical variation than the rest of the economy.

2) Among service industries, only railroad transportation (0.5% of GNP) and local and interurban transit (0.1% of GNP) are in major secular declines.

3) Among mining industries only metal mining (0.06% of GNP) is in a major secular decline.

4) Among manufacturing industries only primary metal industries (1.1% of GNP), tobacco manufactures (0.2% of GNP) and leather (0.1% of GNP) are in major secular decline.

5) Water transportation (0.2% of GNP), the stone, clay, and glass industry (0.5% of GNP), the motor vehicle and equipment industry (1.5% of GNP), the other transportation equipment industries (0.8% of GNP), the petroleum and coal products industry (0.4% of GNP) and construction (2.7% of GNP) have experienced no trend growth over the last 10 years.[1]

If the definition of deindustrialization is limited to industries exhibiting absolute secular declines in production, then the industries listed in 2), 3), and 4) provide one measure of deindustrialization. The U.S. has six industries that comprise approximately 2.0% of GNP that have been in decline.

If the definition also includes industries showing little or no growth in production over the last 10 years then another six industries, enumerated in 5), that comprise 7.0% of GNP should be added to the list.[2]

---

[1] Flat value added in the construction industry primarily reflects a shift in fabrication to other industries (i.e., use of dry wall instead of plaster) and the slowdown in Federal highway construction in the 1960s. Real investment in private structures has grown at a 2-1/2 percent average annual rate over the last 15 years.

[2] This list excludes certain service industries, such as personal services and private households, that do not fit the normal definition of an industry.

Across all sectors of the economy -- 65 industries -- 12 industries (less than 10% of GNP) are showing flat or declining output over the last 10 years. Seven of the 12 are in manufacturing, three are service industries, one is mining and construction. All other industries exhibit growth in production that equals or exceeds growth in total real GNP.

In the context of deindustrialization, should the U.S. Government be concerned about the trend in production in the 12 industries listed above? For several, the answer is clearly no. Poor pricing policy and shifts in demand have driven down tobacco manufactures. Shifts in demand are also responsible for the decline in local and interurban transit. Production has declined in the leather and leather products industry due to shifts in demand and foreign competition. The fate of these three industries is clearly irrelevant in this context.

For several other industries flat or declining production has resulted from technical innovation and substitution of inputs. As mentioned above, the construction industry has experienced roughly flat value added production over the last 15 years. This does not mean that residential and nonresidential building has been flat. A shift in the source of value added has occurred. Prefabricated components (produced in other industries) now provide a larger proportion of the final product -- a building -- and less production occurs within the construction industry. The decline in the railroad transportation industry, and to a certain extent in the water transportation industry, represents pure substitution from high-cost, relatively inefficient providers of transportation services to lower cost providers such as pipelines. For the petroleum and coal products industry flat production primarily reflects the decline in U.S. oil consumption over the last 12 years. Since 1973 U.S. consumption of petroleum products has fallen at an average annual rate of 1 percent per year. Increases in the relative price of energy and the resulting substitution of other inputs for energy more than account for the decline. In fact, flat to declining output in the refining industry may be viewed as the primary result of a successful adaptation of the U.S. economy to the increase in energy prices in the 1970s. Energy efficiency has increased rapidly in almost all industrial applications.

If the seven industries discussed above are viewed as irrelevant in this context or declining due to technical innovation and/or substitution to more efficient production processes, then the definition of deindustrialization may be applied to five industries that constitute about 4% of GNP.

These five industries share several common characteristics that have played major roles in their decline. These characteristics are:

1) Very high unit labor costs relative to the average of manufacturing (see Figures 7(a)-(e)). For example, real compensation as a share of real output has exceeded 100% in the metal mining industry since 1975 peaking at above 140% in 1980 and 1982 (see Figure 7(a)).

2) Slow growth in demand for the product.

3) Relatively high expenditures to meet government regulations for pollution abatement, safety standards, and energy efficiency standards.

4) Intense international competition except where the U.S. Government has intervened to limit imports. Based on the available evidence, U.S. Government intervention to alleviate characteristic 4) only exacerbated characteristics 1) and 2).

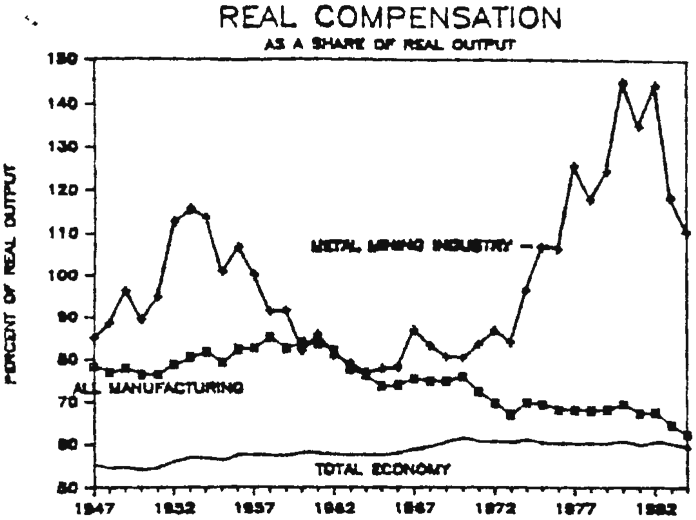


Figure 7(a)

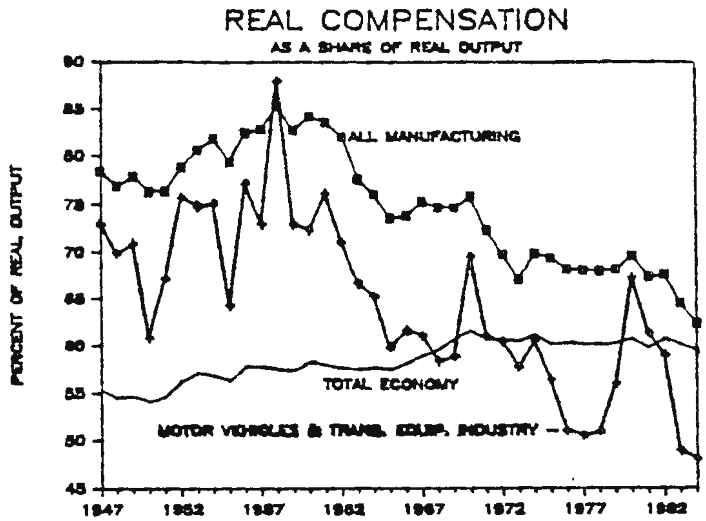


Figure 7(b)

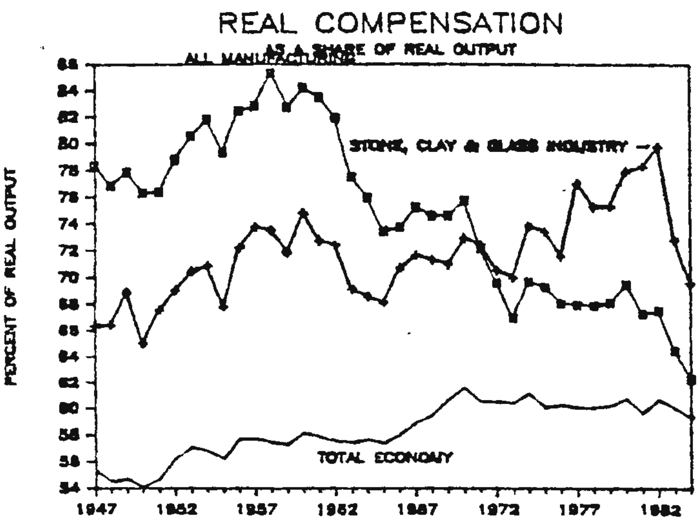


Figure 7(c)

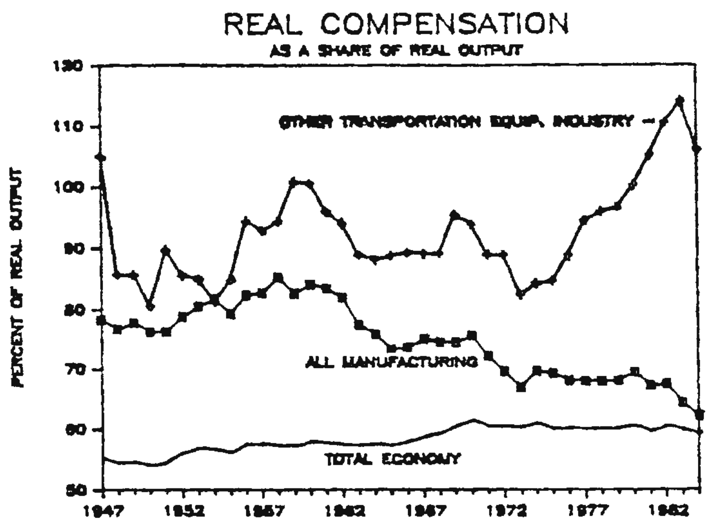


Figure 7(d)

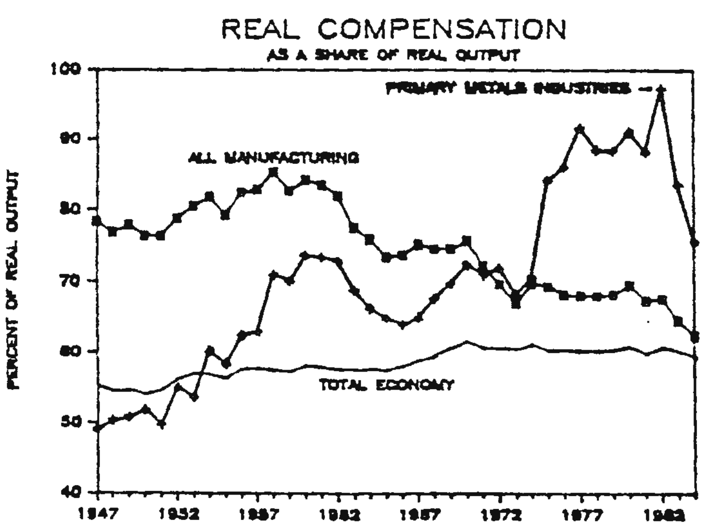


Figure 7(e)

Conclusions

Four specific conclusions are suggested by the evidence reviewed above.

1) The U.S. economy is not undergoing deindustrialization:

   - Long-term and recent trends in manufacturing output are strongly positive and roughly proportional to total growth of the economy, even for 1980-84.

   - Productivity growth in manufacturing continues at a pace more than twice that in the rest of the economy.

2) U.S. economic performance overall and even in manufacturing is significantly better than the performances of the vast majority of our trading partners:

   - Growth in U.S. manufacturing production from 1980-84 is about twice the average of other OECD countries.

   - Recent growth (1979-84) in the U.S. manufacturing capital stock is well in excess of the growth rates for most of our industrialized trading partners.

3) The consequences of variations in economic growth are especially pronounced for manufacturing and the goods-producing sector, helping to explain the deep trough in the last recession for these sectors and their exceptionally strong recovery (which is not yet complete, however).

4) Only a handful of U.S. industries exhibit a persistent decline in real output.

1 GROSS NATIONAL PRODUCT

2 - DOMESTIC INDUSTRIES (GROSS DOMESTIC PRODUCT)

3 PRIVATE INDUSTRIES

1 4 AGRICULTURE, FORESTRY, & FISHERIES

5 FARMS (01-02)
6 AGRICULTURAL SERVICES, FORESTRY, & FISHERIES (07-09)

2 7 MINING

8 METAL MINING (10)
9 COAL MINING (11-12)
10 OIL & GAS EXTRACTION (13)
11 NONMETALLIC MINERALS, EXCEPT FUELS (14)

3 12 CONSTRUCTION (15-17)

4 13 MANUFACTURING

14 DURABLE GOODS

15 LUMBER & WOOD PRODUCTS (24)
16 FURNITURE & FIXTURES (25)
17 STONE, CLAY, & GLASS PRODUCTS (32)
18 PRIMARY METAL INDUSTRIES (33)
19 FABRICATED METAL PRODUCTS (34)
20 MACHINERY, EXCEPT ELECTRICAL (35)
21 ELECTRIC & ELECTRONIC EQUIPMENT (36)
22 MOTOR VEHICLES & EQUIPMENT (371)
23 OTHER TRANSPORTATION EQUIPMENT (372-379)
24 INSTRUMENTS & RELATED PRODUCTS (38)
25 MISCELLANEOUS MANUFACTURING INDUSTRIES (39)

5 26 NONDURABLE GOODS

27 FOOD & KINDRED PRODUCTS (20)
28 TOBACCO MANUFACTURES (21)
29 TEXTILE MILL PRODUCTS (22)
30 APPAREL & OTHER TEXTILE PRODUCTS (23)
31 PAPER & ALLIED PRODUCTS (26)
32 PRINTING & PUBLISHING (27)
33 CHEMICALS & ALLIED PRODUCTS (28)
34 PETROLEUM & COAL PRODUCTS (29)
35 RUBBER & MISCELLANEOUS PLASTIC PRODUCTS (30)
36 LEATHER & LEATHER PRODUCTS (31)

37 TRANSPORTATION AND PUBLIC UTILITIES

6 38 TRANSPORTATION

39 RAILROAD TRANSPORTATION (40)
40 LOCAL & INTERURBAN PASSENGER TRANSIT (41)
41 TRUCKING & WAREHOUSING (42)
42 WATER TRANSPORTATION (44)
43 TRANSPORTATION BY AIR (45)
44 PIPELINES, EXCEPT NATURAL GAS (46)
45 TRANSPORTATION SERVICES (47)

7 46 COMMUNICATION

47 TELEPHONE & TELEGRAPH (481,2,9)
48 RADIO & TELEVISION BROADCASTING (483)

8 49 ELECTRIC, GAS, & SANITARY SERVICES (49)

50 WHOLESALE TRADE (50-51)

9 51 RETAIL TRADE (52-59)

10 52 FINANCE, INSURANCE, & REAL ESTATE

53 BANKING (60)
54 CREDIT AGENCIES OTHER THAN BANKS (61)
55 SECURITY, COMMODITY BROKERS & SERVICES (62)
56 INSURANCE CARRIERS (63)
57 INSURANCE AGENTS, BROKERS, & SERVICES (64)
58 REAL ESTATE (65-66)
59 HOLDING & OTHER INVESTMENT COMPANIES (67)

11 60 SERVICES

61 HOTELS & OTHER LODGING PLACES (70)
62 PERSONAL SERVICES (72)
63 BUSINESS SERVICES (73)
64 AUTO REPAIR, SERVICES, & GARAGES (75)
65 MISCELLANEOUS REPAIR SERVICES (76)
66 MOTION PICTURES (78)
67 AMUSEMENT & RECREATION SERVICES (79)
68 HEALTH SERVICES (80)
69 LEGAL SERVICES (81)
70 EDUCATIONAL SERVICES (82)
71 SOCIAL SERVICES & MEMBERSHIP ORGANIZATIONS (83,86)
72 MISCELLANEOUS PROFESSIONAL SERVICES (84,89)
73 PRIVATE HOUSEHOLDS (88)

74 GOVERNMENT & GOVERNMENT ENTERPRISES

12 75 GOVERNMENT

76 FEDERAL GOVERNMENT (91-97)
77 STATE & LOCAL GOVERNMENT (91-96)

78 GOVERNMENT ENTERPRISES

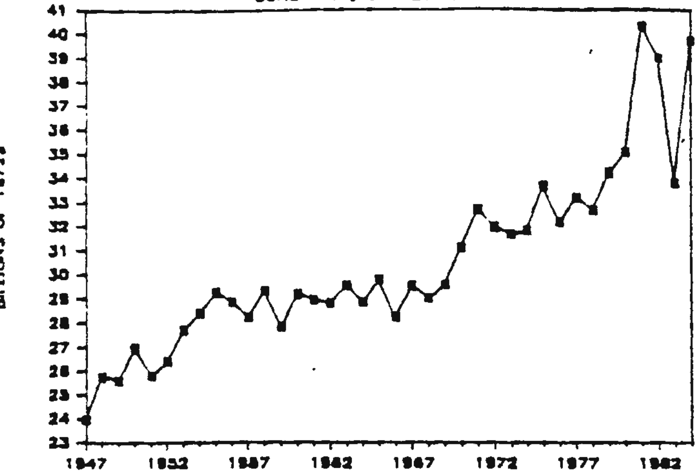
79 FEDERAL GOVERNMENT ENTERPRISES (01-89)
80 STATE AND LOCAL ENTERPRISES (01-89)

81 STATISTICAL DISCREPANCY

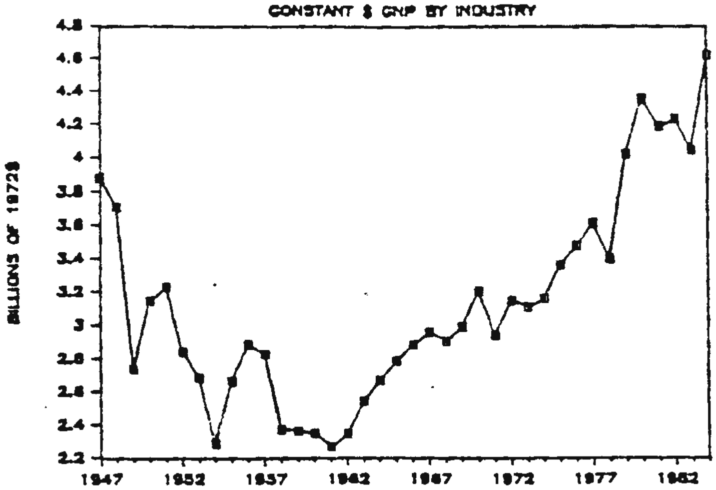
82 RESIDUAL

13 83 REST OF THE WORLD

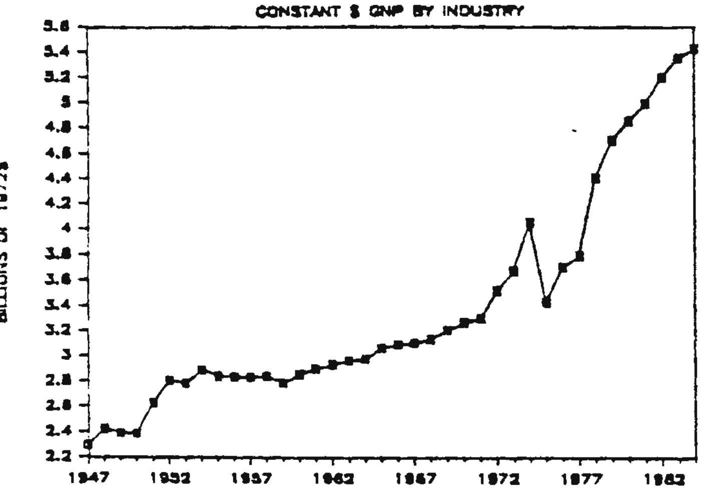
FARMS
CONSTANT $ GNP BY INDUSTRY



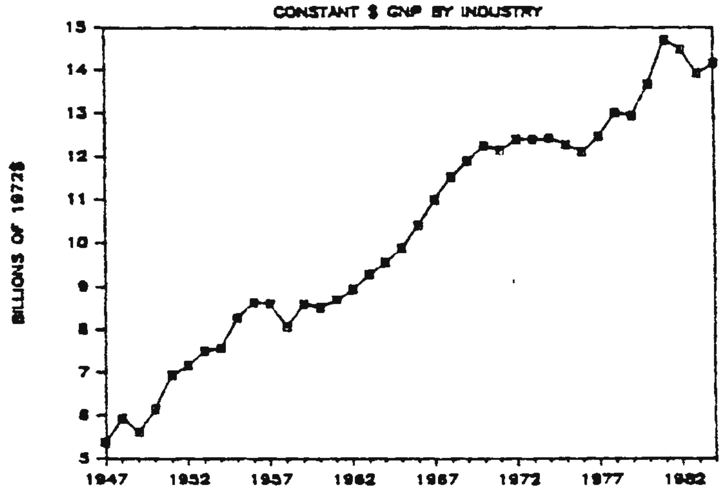
COAL MINING
CONSTANT $ GNP BY INDUSTRY



AGRI SERV., FORESTRY & FISHERIES
CONSTANT $ GNP BY INDUSTRY

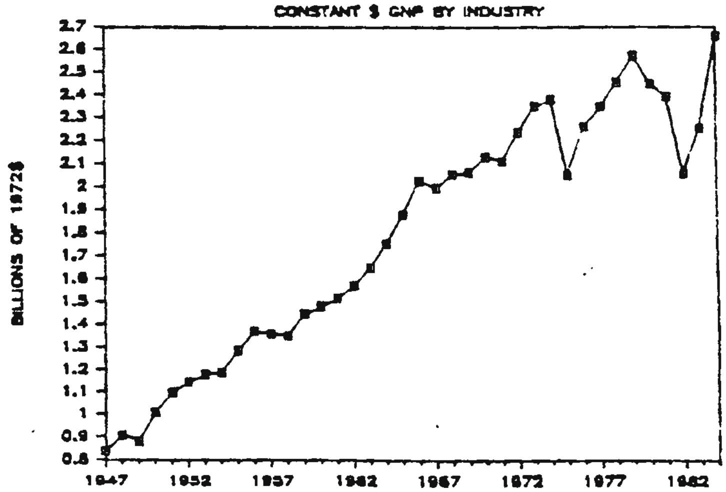


OIL & GAS EXTRACTION
CONSTANT $ GNP BY INDUSTRY

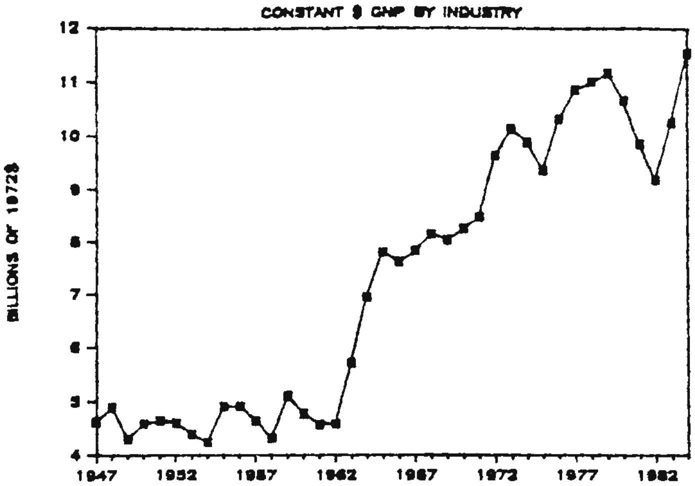


METAL MINING
CONSTANT $ GNP BY INDUSTRY

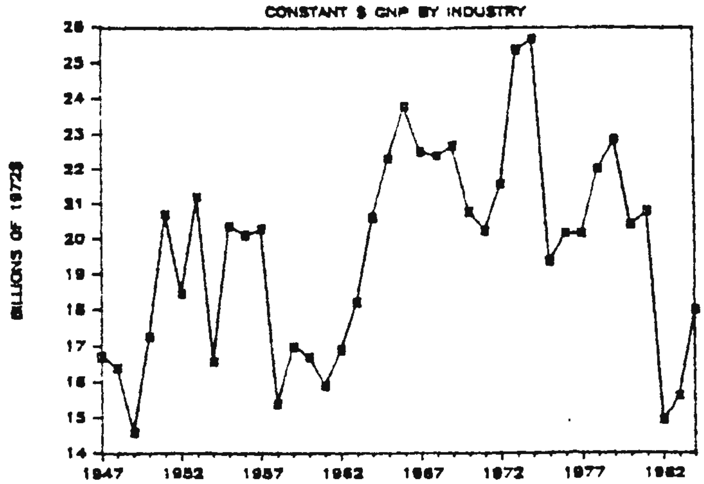
NONMETALLIC MINERALS X FUELS
CONSTANT $ GNP BY INDUSTRY



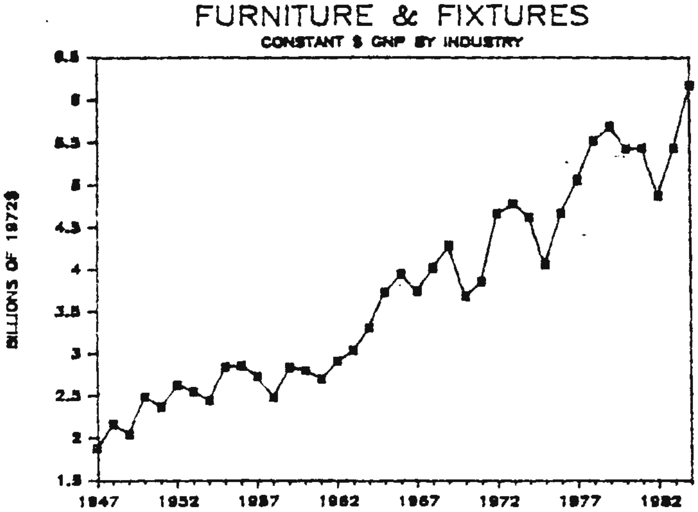
LUMBER & WOOD PRODUCTS



PRIMARY METAL INDUSTRIES

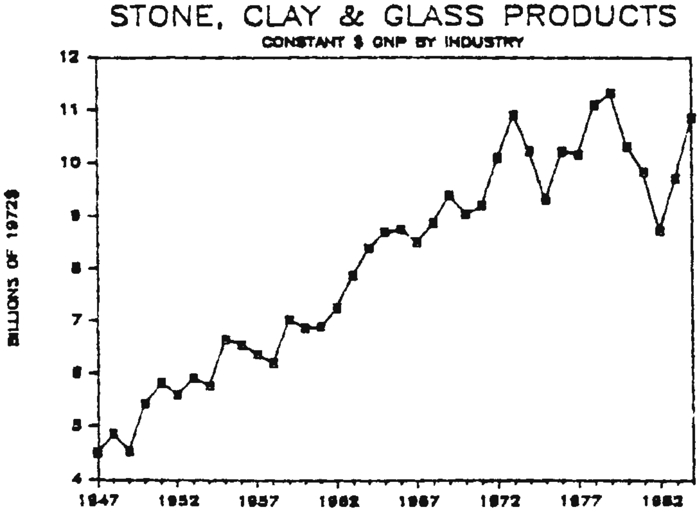


FURNITURE & FIXTURES

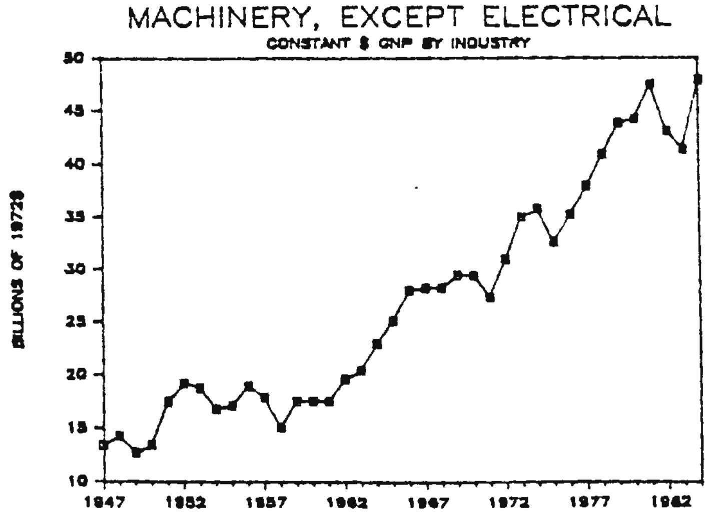


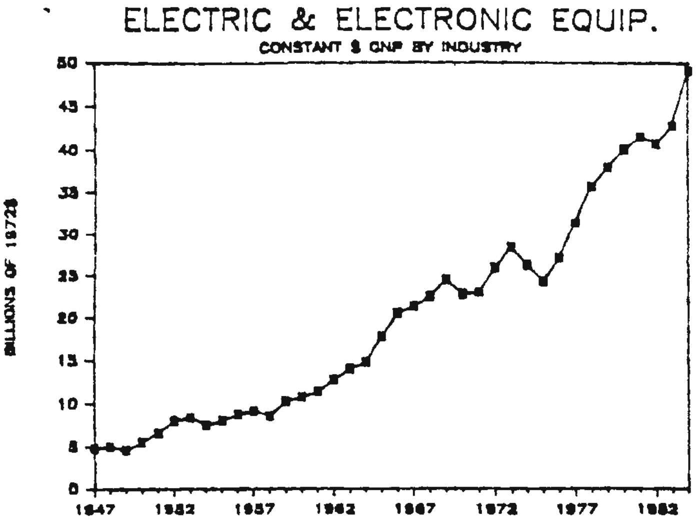
FABRICATED METAL PRODUCTS

STONE, CLAY & GLASS PRODUCTS



MACHINERY, EXCEPT ELECTRICAL




ELECTRIC & ELECTRONIC EQUIP.
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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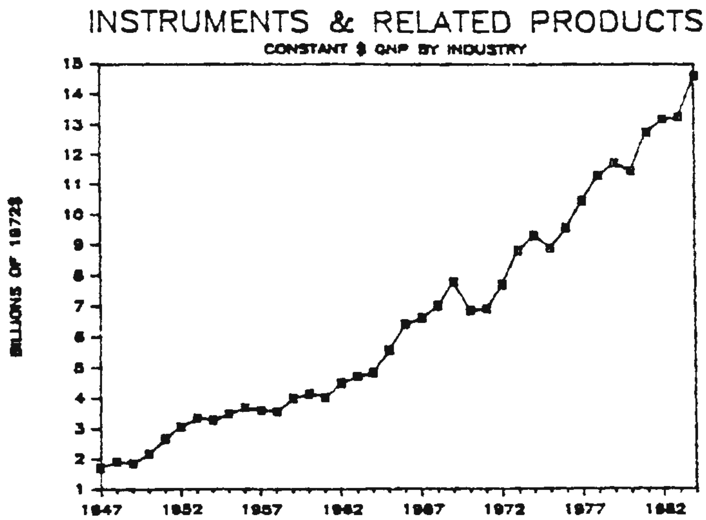
INSTRUMENTS & RELATED PRODUCTS
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
1
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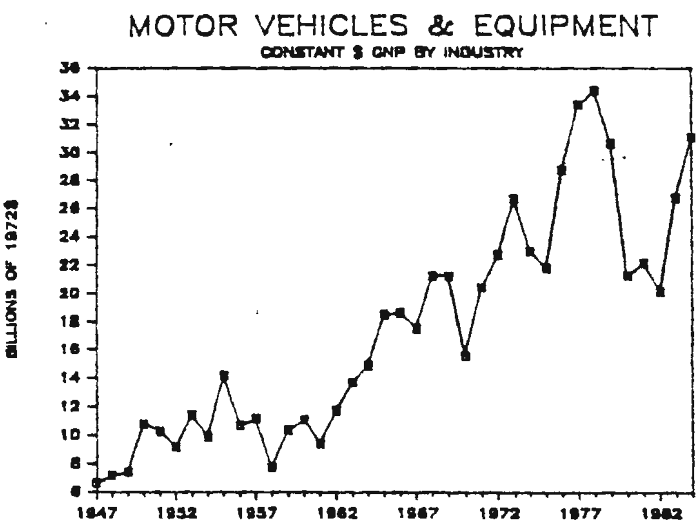
MOTOR VEHICLES & EQUIPMENT
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
6
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MISC. MANUFACTURING INDUSTRIES
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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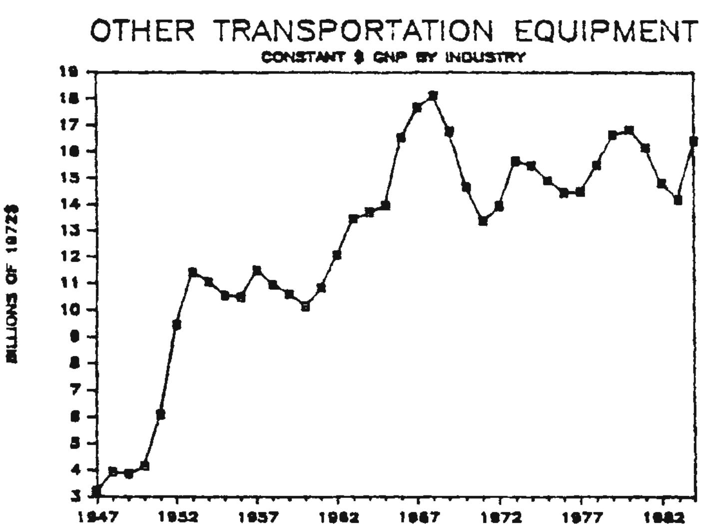
OTHER TRANSPORTATION EQUIPMENT
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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FOOD & KINDRED PRODUCTS
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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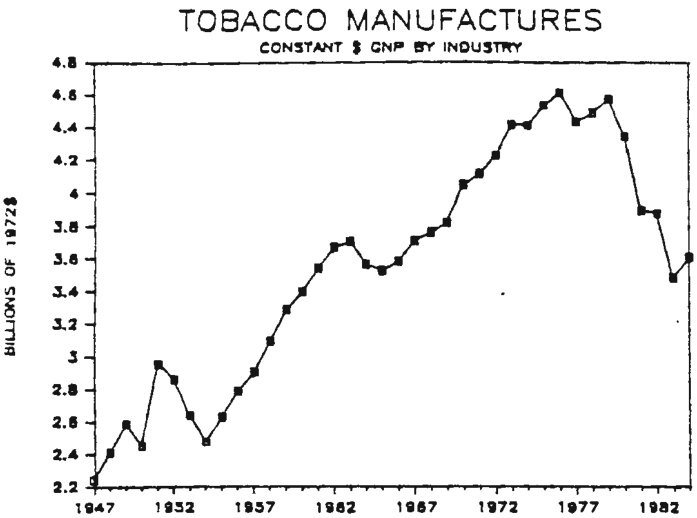
TOBACCO MANUFACTURES
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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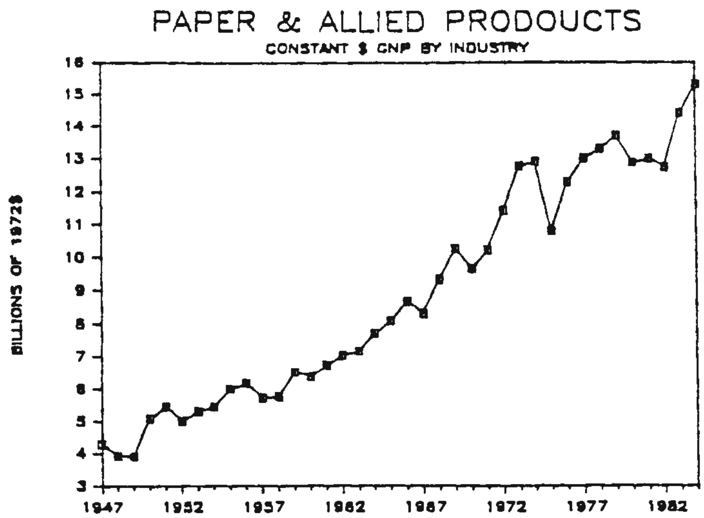
PAPER & ALLIED PRODOUCTS
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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1982


TEXTILE MILL PRODUCTS
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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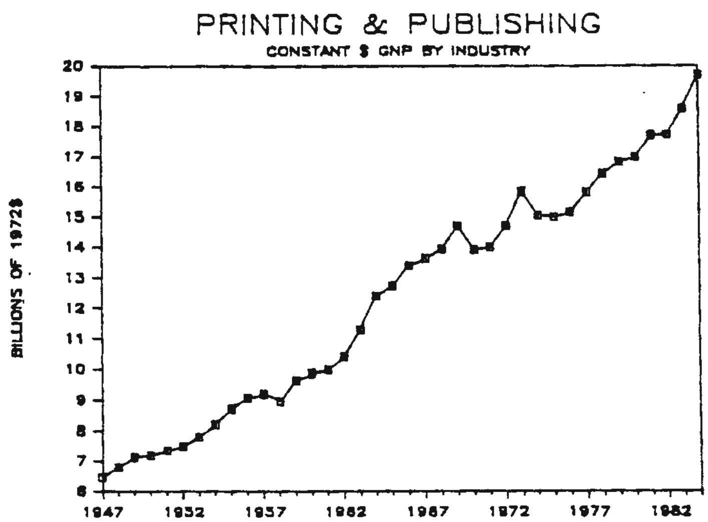
PRINTING & PUBLISHING
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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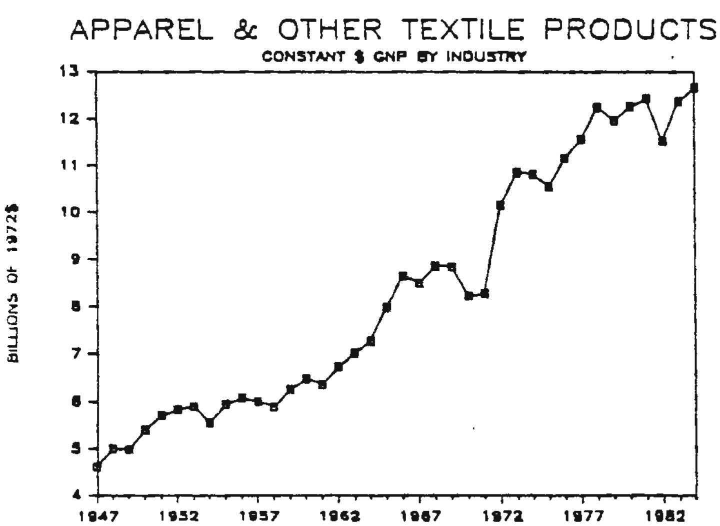
APPAREL & OTHER TEXTILE PRODUCTS
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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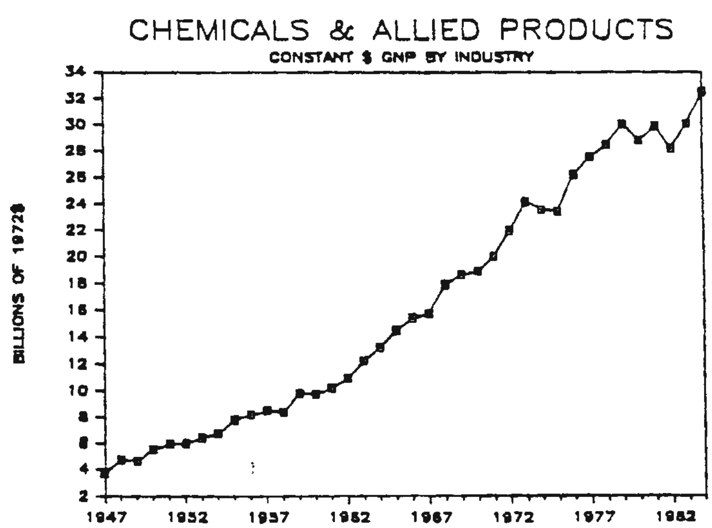
CHEMICALS & ALLIED PRODUCTS
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
34
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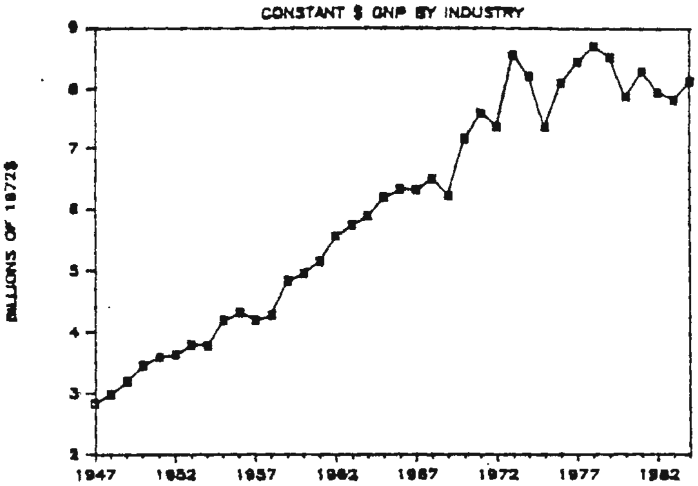
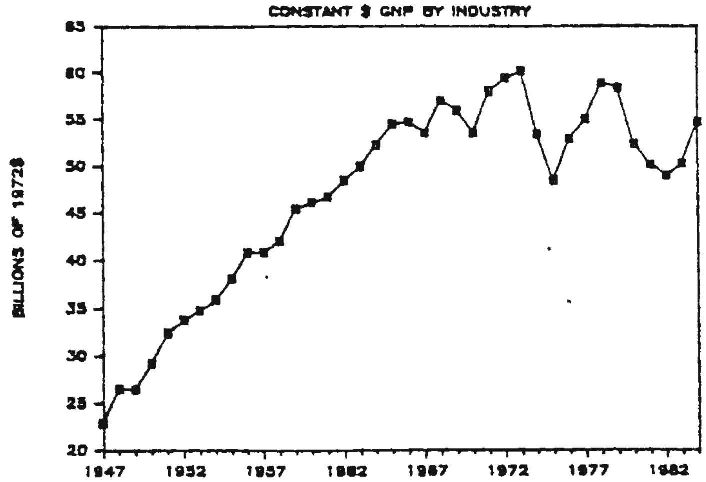
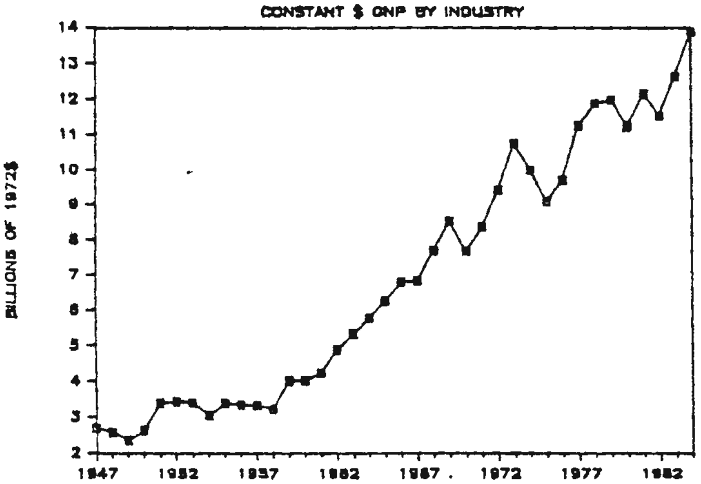
PETROLEUM & COAL PRODUCTS
CONSTANT $ GNP BY INDUSTRY



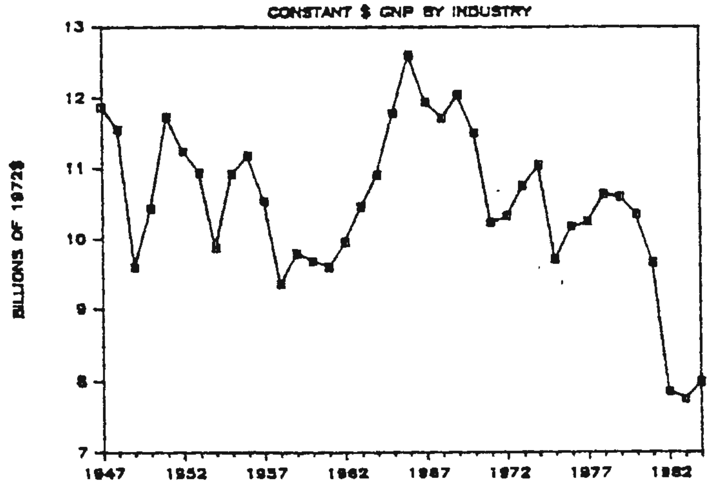
CONSTRUCTION
CONSTANT $ GNP BY INDUSTRY



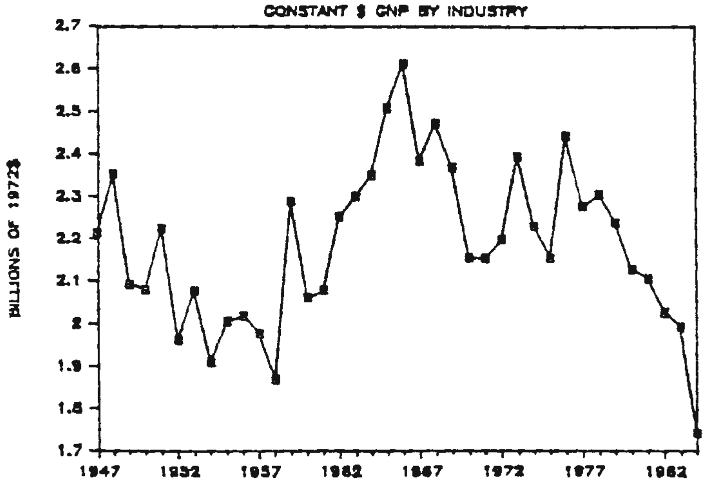
RUBBER & MISC. PLASTIC PRODUCTS
CONSTANT $ GNP BY INDUSTRY



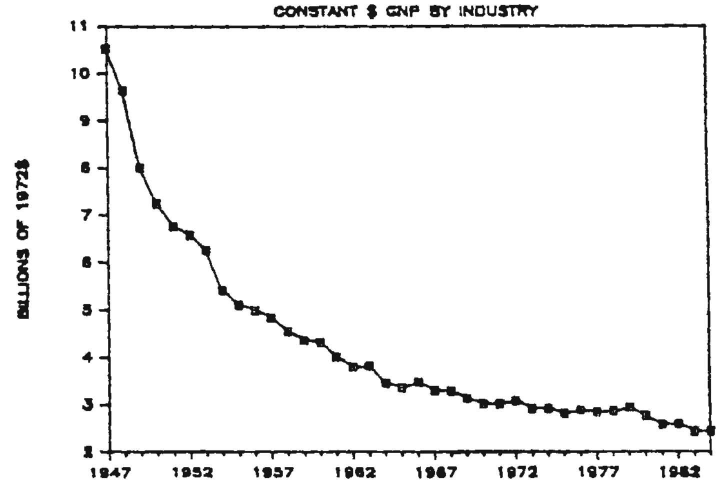
RAILROAD TRANSPORTATION
CONSTANT $ GNP BY INDUSTRY



LEATHER & LEATHER PRODUCTS
CONSTANT $ GNP BY INDUSTRY

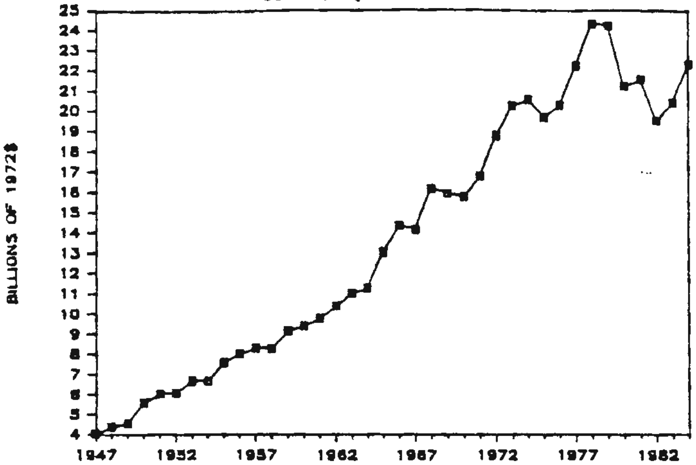


LOCAL & INTERURBAN TRANSIT
CONSTANT $ GNP BY INDUSTRY



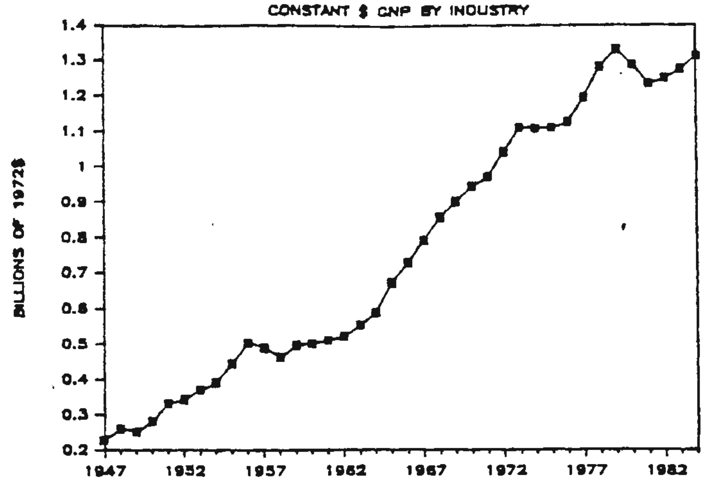
TRUCKING & WAREHOUSING

CONSTANT $ GNP BY INDUSTRY



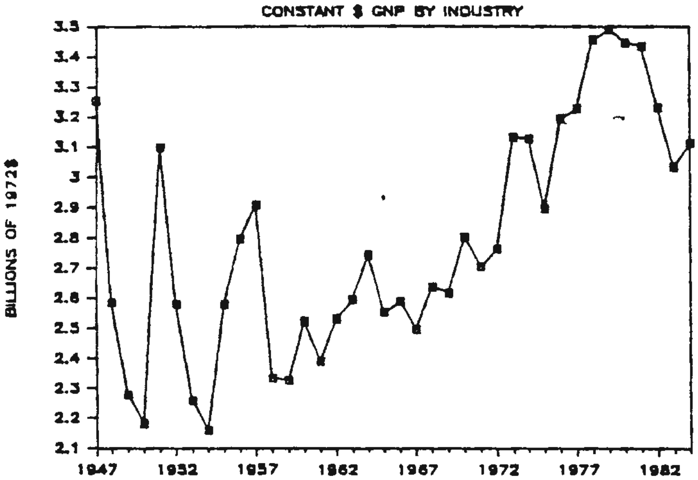
PIPELINES, EXCEPT NATURAL GAS

CONSTANT $ GNP BY INDUSTRY



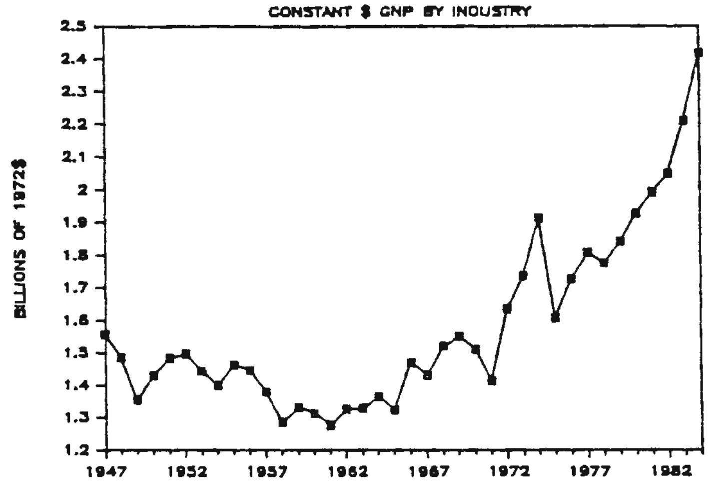
WATER TRANSPORTATION

CONSTANT $ GNP BY INDUSTRY



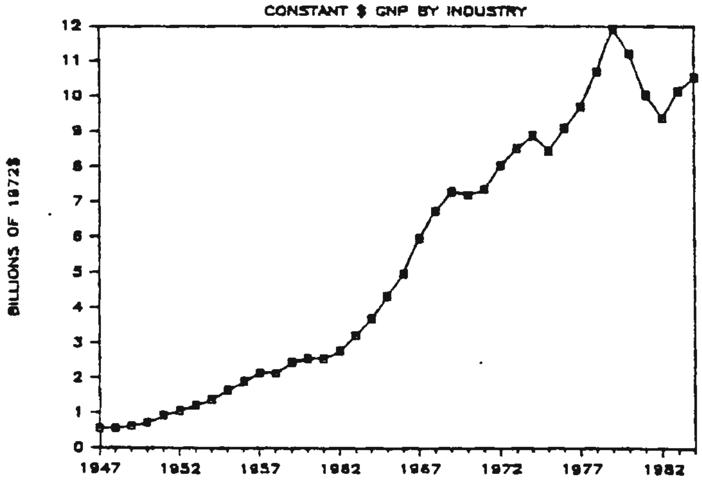
TRANSPORTATION SERVICES

CONSTANT $ GNP BY INDUSTRY



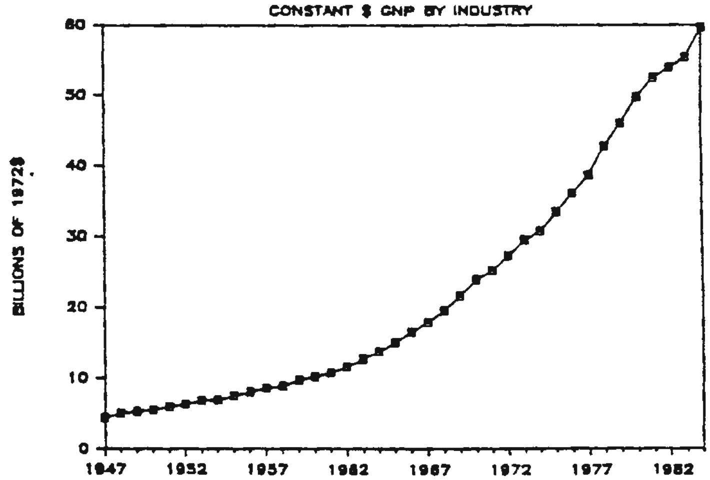
TRANSPORTATION BY AIR

CONSTANT $ GNP BY INDUSTRY

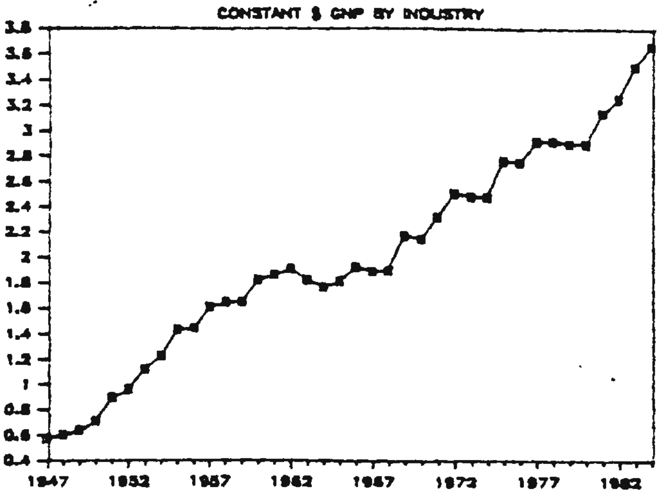


TELEPHONE & TELEGRAPH

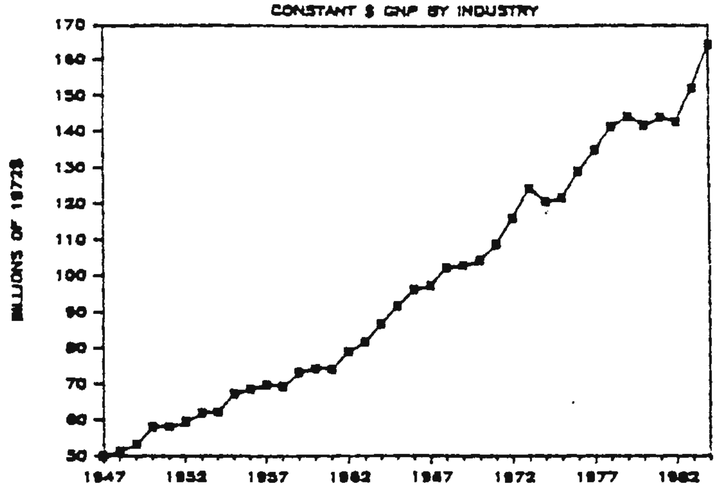
CONSTANT $ GNP BY INDUSTRY



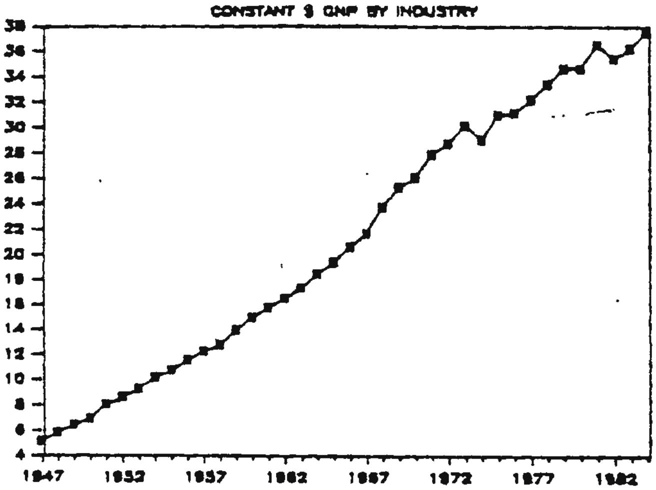
RADIO & TV BROADCASTING
CONSTANT $ GNP BY INDUSTRY



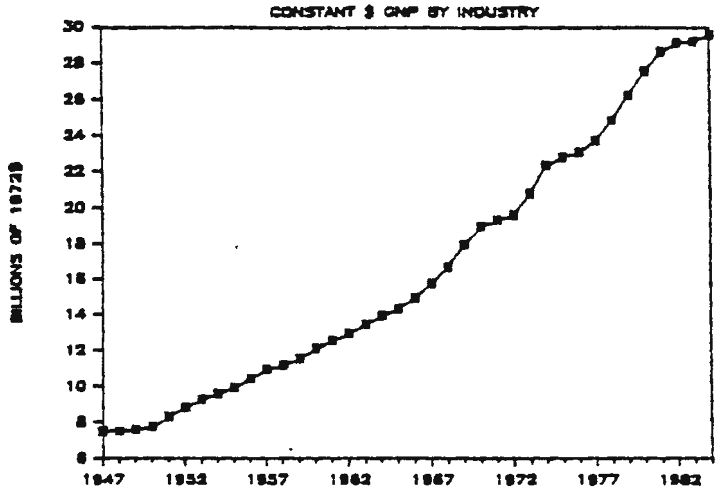
RETAIL TRADE
CONSTANT $ GNP BY INDUSTRY



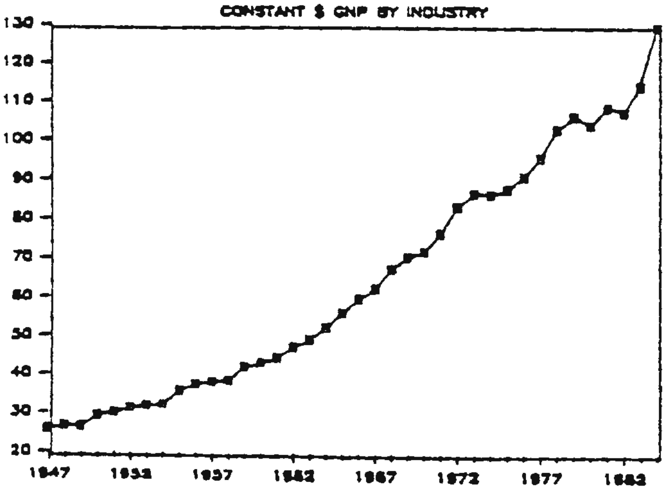
ELEC, GAS & SANITRY SERV
CONSTANT $ GNP BY INDUSTRY



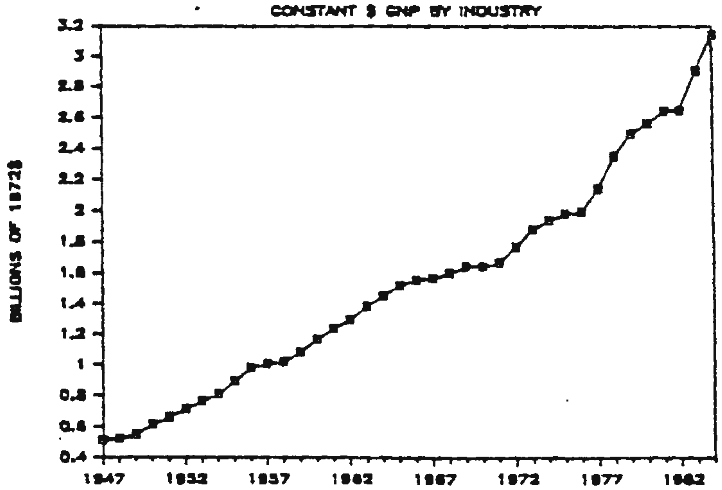
BANKING
CONSTANT $ GNP BY INDUSTRY



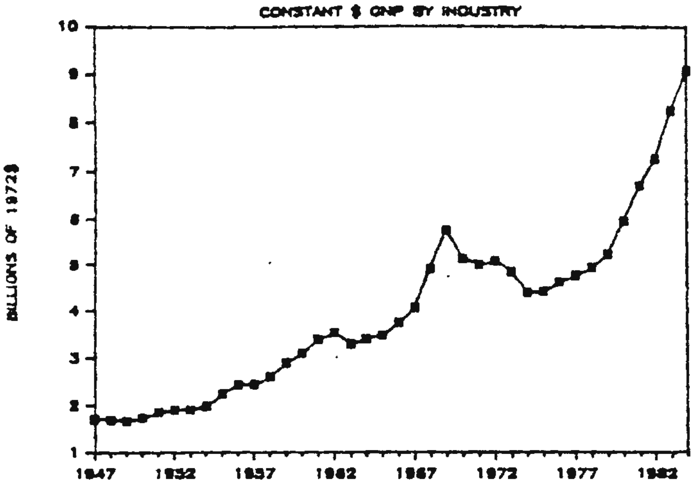
WHOLESALE TRADE
CONSTANT $ GNP BY INDUSTRY



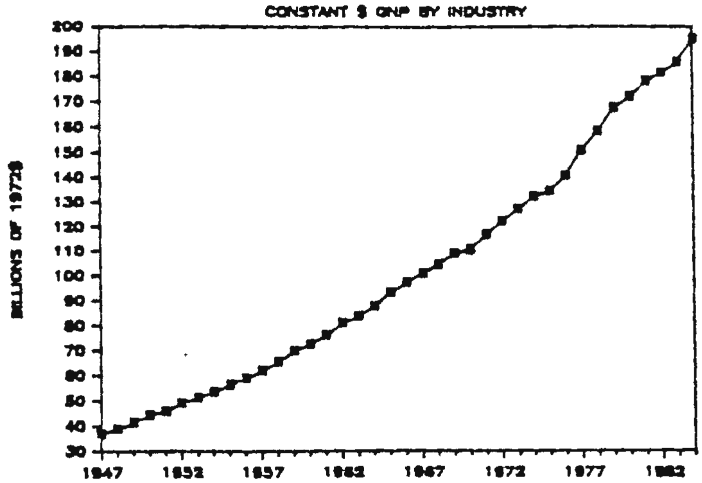
CREDIT AGENCY OTHR THAN BANKS
CONSTANT $ GNP BY INDUSTRY



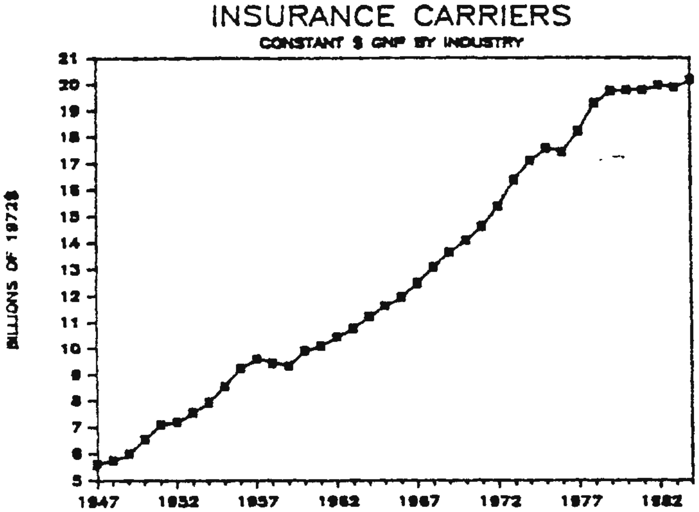
SECURITY, COMM BROKERS & SERV



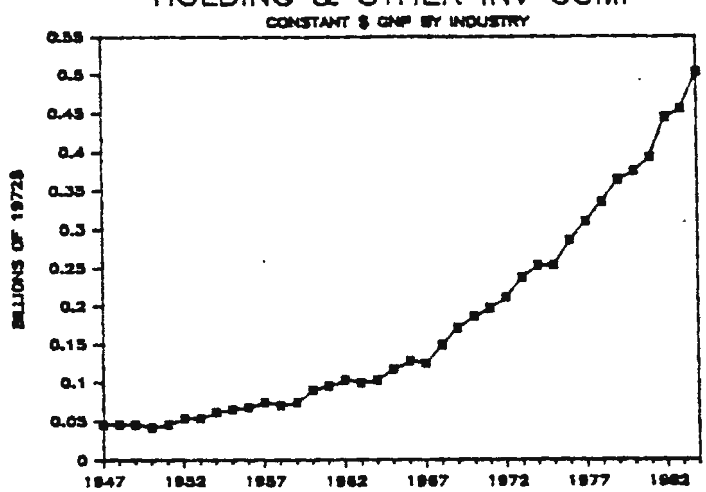
REAL ESTATE



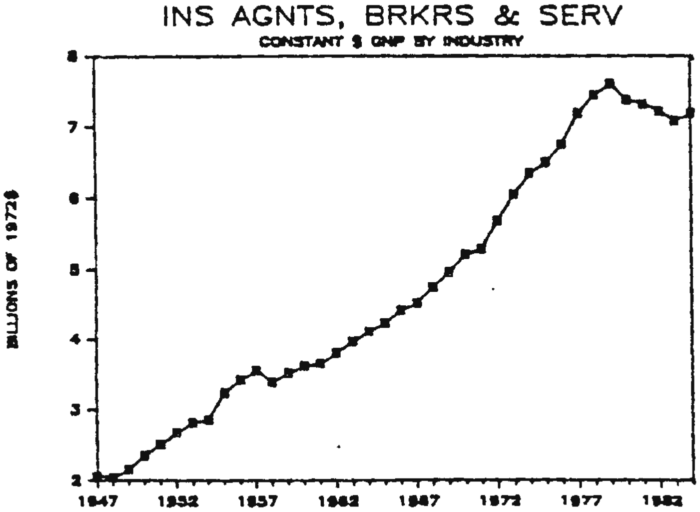
INSURANCE CARRIERS



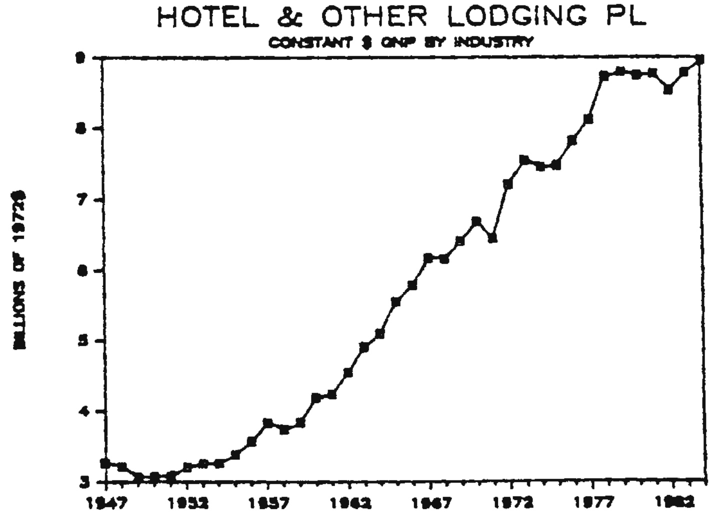
HOLDING & OTHER INV COMP



INS AGNTS, BRKRS & SERV

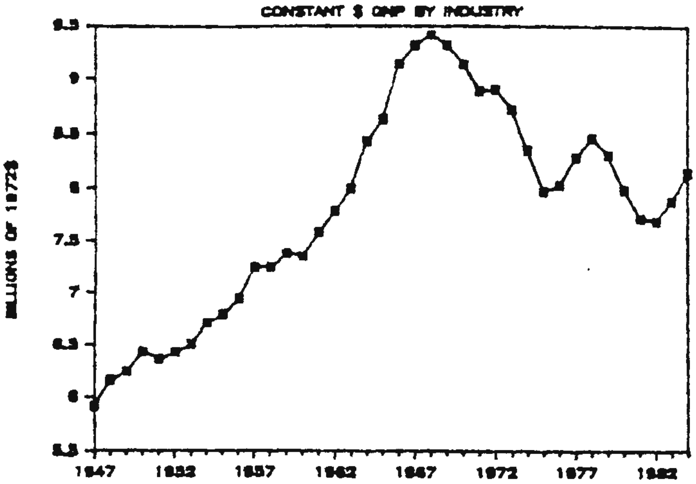


HOTEL & OTHER LODGING PL



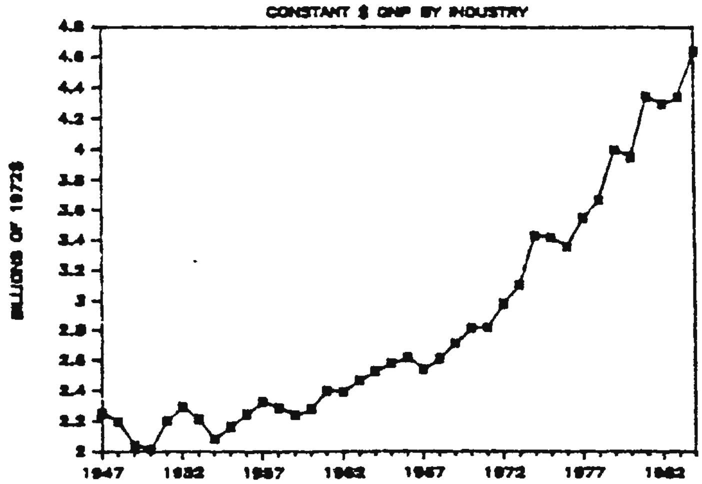
PERSONAL SERVICES

CONSTANT $ GNP BY INDUSTRY



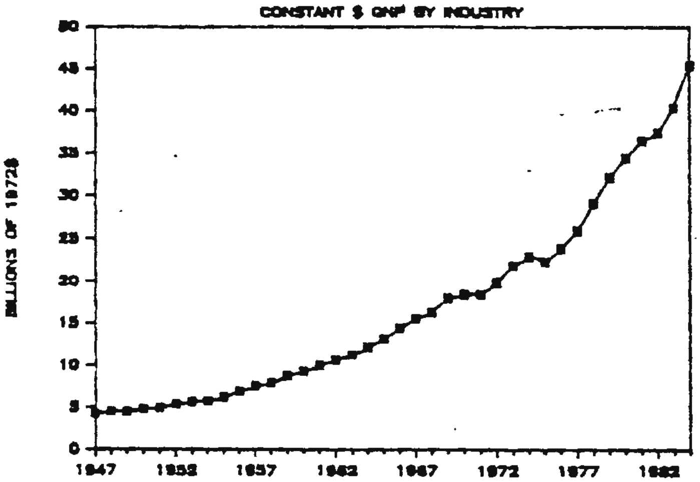
MISC REPAIR SERVICES

CONSTANT $ GNP BY INDUSTRY



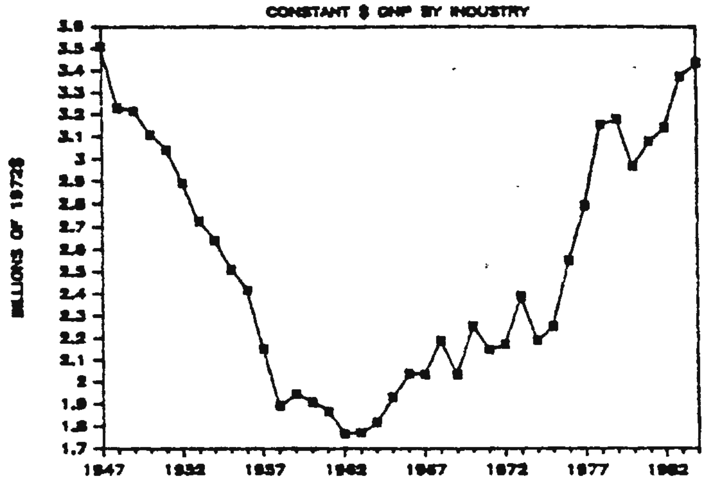
BUSINESS SERVICES

CONSTANT $ GNP BY INDUSTRY



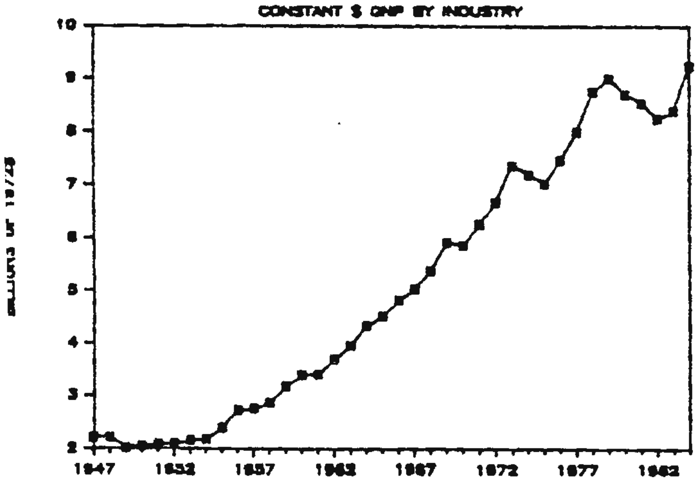
MOTION PICTURES

CONSTANT $ GNP BY INDUSTRY



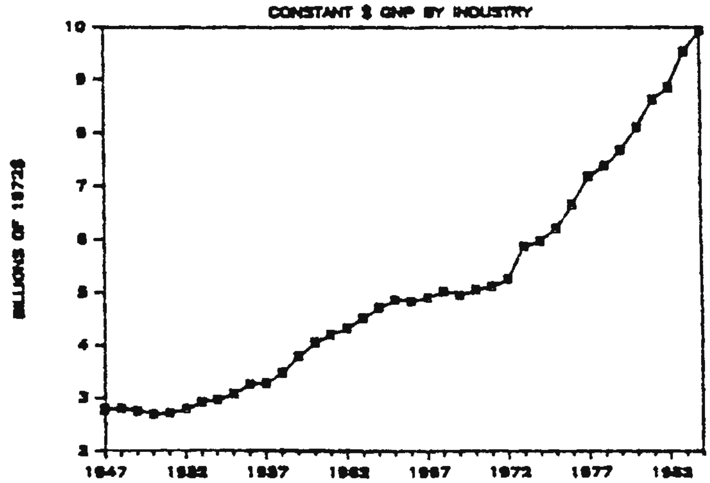
AUTO REPAIR, SERV & GARAG

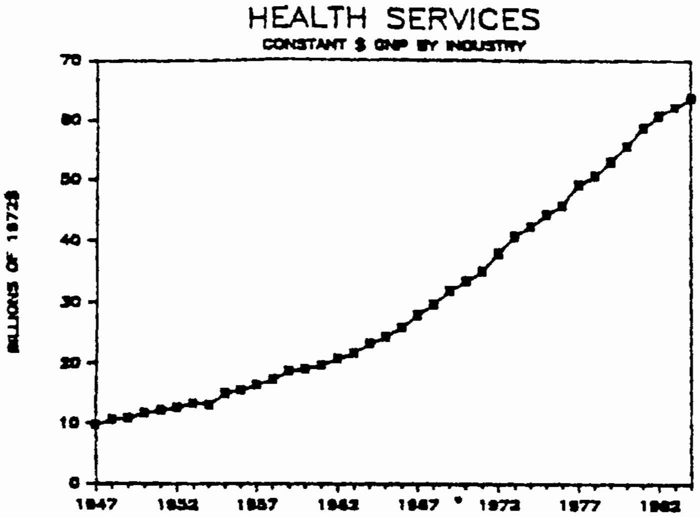
CONSTANT $ GNP BY INDUSTRY



AMUSEMENT & REC SERVICES

CONSTANT $ GNP BY INDUSTRY




HEALTH SERVICES
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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SOCIAL SERV & MEMBERSHIP ORG
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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LEGAL SERVICES
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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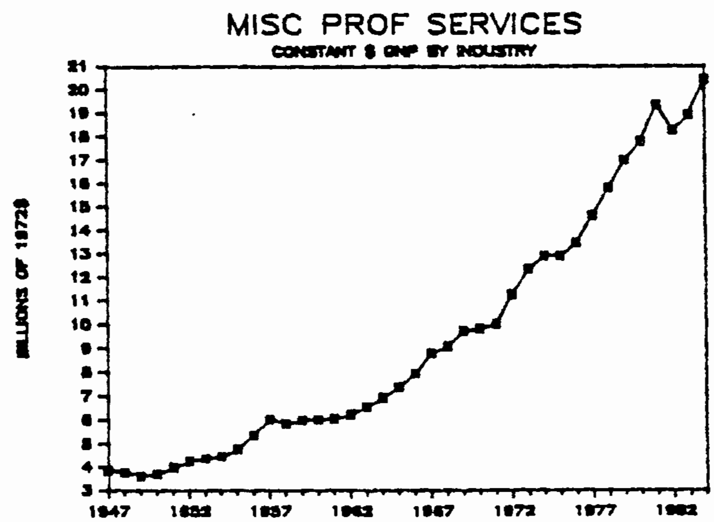
MISC PROF SERVICES
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
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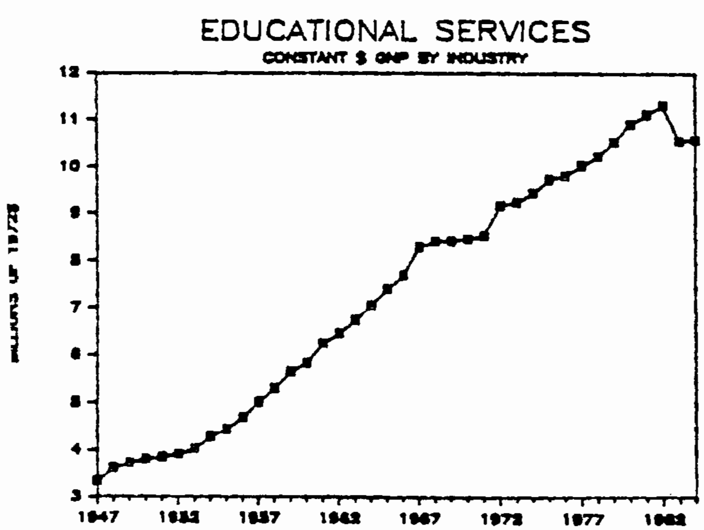
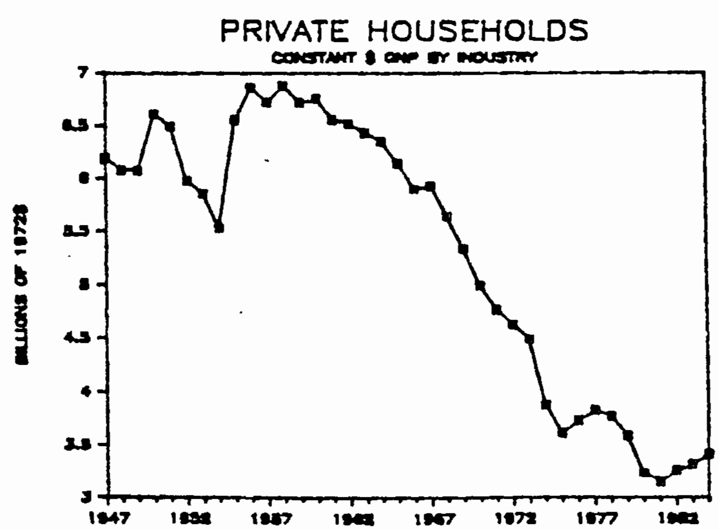
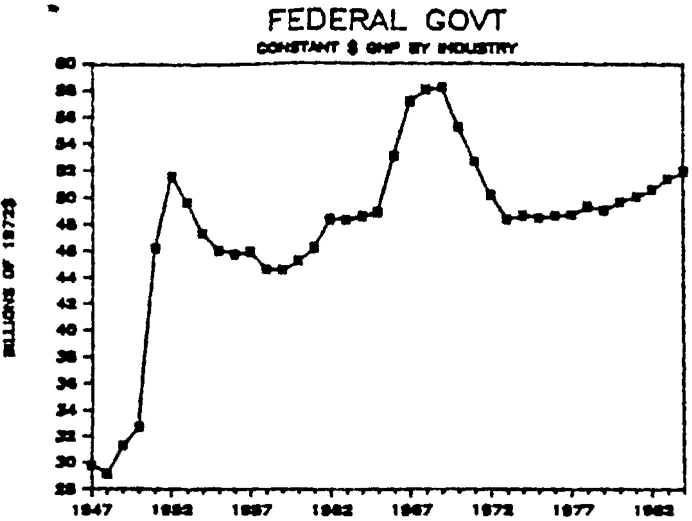
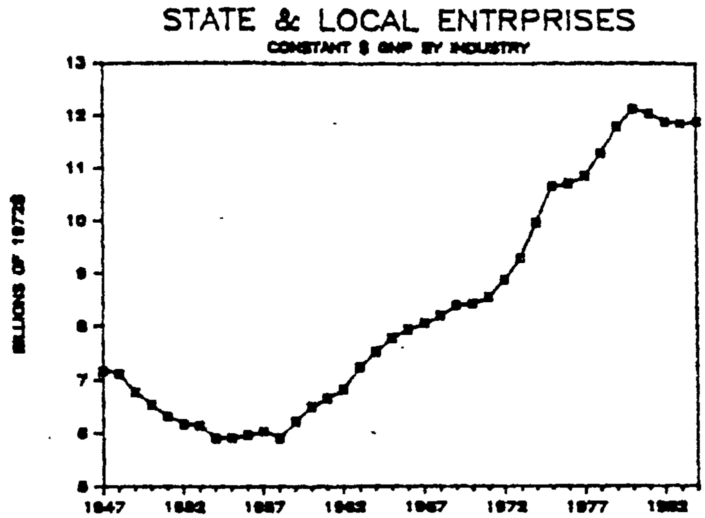
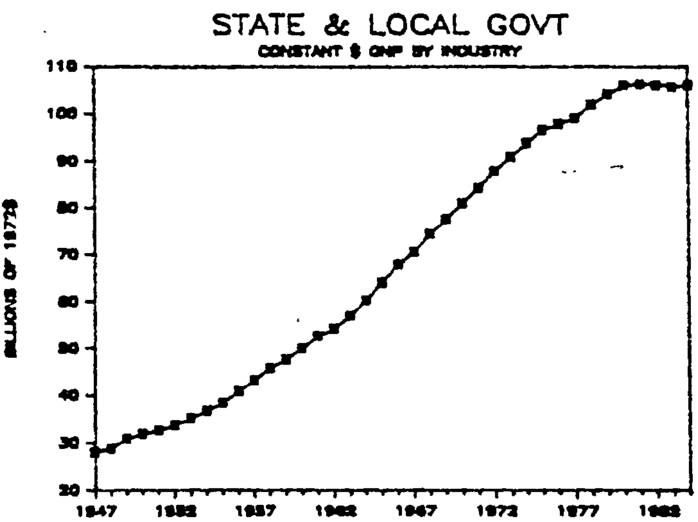
1977
1982

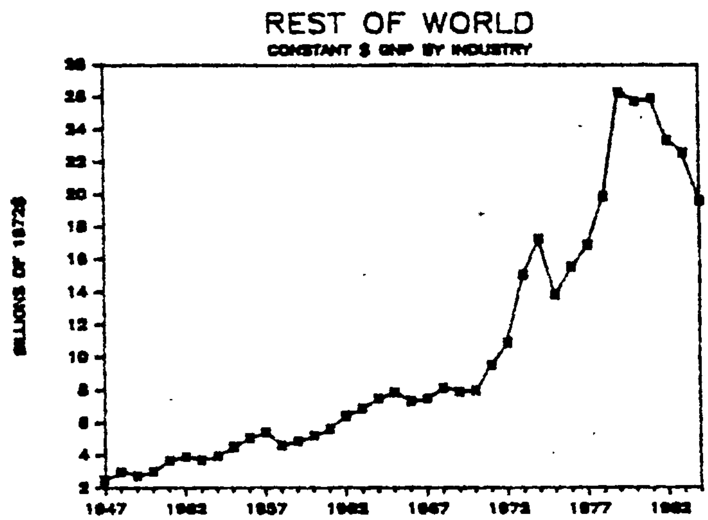

EDUCATIONAL SERVICES
CONSTANT $ GNP BY INDUSTRY
3
4
5
6
7
8
9
10
11
12
1947
1952
1957
1962
1967
1972
1977
1982

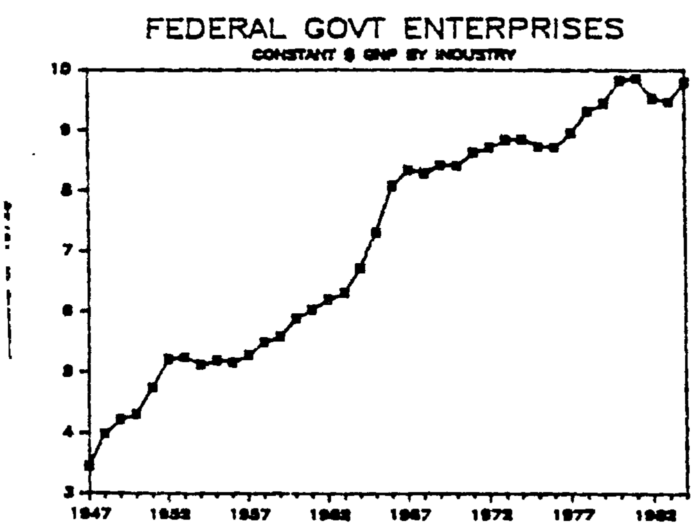

PRIVATE HOUSEHOLDS
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
3
3.5
4
4.5
5
5.5
6
6.5
7
1947
1952
1957
1962
1967
1972
1977
1982


FEDERAL GOVT
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
60
58
56
54
52
50
48
46
44
42
40
38
36
34
32
30
28
1947
1952
1957
1962
1967
1972
1977
1982


STATE & LOCAL ENTRPRISES
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
13
12
11
10
9
8
7
6
5
1947
1952
1957
1962
1967
1972
1977
1982


STATE & LOCAL GOVT
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
110
100
90
80
70
60
50
40
30
20
1947
1952
1957
1962
1967
1972
1977
1982


REST OF WORLD
CONSTANT $ GNP BY INDUSTRY
BILLIONS OF 1972$
28
26
24
22
20
18
16
14
12
10
8
6
4
2
1947
1952
1957
1962
1967
1972
1977
1982


FEDERAL GOVT ENTERPRISES
CONSTANT $ GNP BY INDUSTRY
10
9
8
7
6
5
4
3
1947
1952
1957
1962
1967
1972
1977
1982