

TABLE 6. INDUSTRY COMPOSITION OF MANUFACTURING OUTPUT,
1951-1977 (Percentages of total value of output)

	1951	1955	1959	1964	1971	1977
Durable Goods						
Lumber and wood	3.8	3.2	3.0	2.9	3.0	3.2
Furniture	1.7	1.6	1.6	1.6	1.6	1.5
Stone, clay, and glass	3.5	3.8	3.8	3.5	3.4	3.2
Primary metals	10.0	9.4	8.4	8.1	6.7	6.9
Fabricated metals	7.3	7.1	7.1	7.2	7.5	7.6
Machinery	10.1	8.9	9.5	10.5	10.5	11.9
Electrical machinery	6.3	6.5	8.2	8.1	8.9	8.7
Motor vehicles	7.0	8.8	6.4	7.6	7.8	8.1
Transportation equipment	3.9	5.6	6.2	6.4	5.3	4.7
Instruments	2.0	2.2	2.6	2.6	2.9	2.9
Miscellaneous	2.0	1.9	1.9	1.7	1.8	1.7
Subtotal	57.5	59.2	58.8	60.3	59.4	60.4
Dispersion rate <u>a/</u>	1.73	1.73	0.70	0.63	0.57	
Nondurable Goods						
Food products	9.1	9.6	9.7	9.1	8.9	8.1
Tobacco	.6	.7	.8	.8	.8	.7
Textile products	5.6	3.9	3.6	3.4	3.4	3.0
Apparel products	4.3	3.9	3.8	3.9	3.9	3.3
Printing and publishing	3.7	3.5	3.7	3.6	3.7	3.7
Paper products	4.4	4.8	5.1	5.4	5.5	5.1
Chemical products	6.5	6.7	7.3	7.2	7.4	7.4
Petroleum products	4.6	4.4	3.6	2.8	3.1	4.5
Rubber and plastic	2.2	2.1	2.4	2.5	3.0	3.0
Leather products	1.5	1.3	1.3	1.2	1.0	.7
Subtotal	42.5	40.8	41.2	39.7	40.6	39.6
Dispersion rate <u>a/</u>	1.00	0.70	0.52	0.23	0.67	
Total <u>b/</u>	100.0	100.0	100.0	100.0	100.0	100.0
Total dispersion rate <u>a/</u>	2.73	2.43	1.22	0.86	1.24	

SOURCE: U. S. Department of Commerce, Bureau of Economic Analysis.

- a. Annualized rates. See note to Table 5 for the explanation and general formula used for rates of dispersion. The rates presented for durables and nondurables use percentages of total manufacturing output and can be thought of as the contribution of each sub-group to total manufacturing dispersion.
- b. Numbers may not add to totals because of rounding.

have heavily subsidized steel production. Machinery (including engines and turbines, construction and mining equipment, and machine tools), electrical machinery (including electronic transmission equipment, household appliances, communication equipment, and semiconductors), and manufacturing instruments (including scientific and research instruments, and optical and medical instruments) show significant long-term increases in their share of manufacturing output. These growing sectors have enjoyed considerable technical advances, and the demand for their products has increased as their costs have declined. (It is interesting to note that fabricated metals, including structural metal products, screw machine products, and metal forgings and stampings, showed a surprisingly stable, if not upward, trend in their share of manufacturing output.) The share of motor vehicles remained fairly steady, if not upward in trend, until the late 1970s, but was severely affected by the 1981-1982 recession, and the industry's future is uncertain. Table 6 shows that the rate of dispersion for durable goods has fallen over time, while industry shares have stabilized.

Similar patterns can be seen in nondurable goods production. Textiles, apparel, and leather production show marked decreases over the period. Again, these are classic examples of mature industries. Chemical and petroleum production, on the other hand, show significant increases in percent of manufacturing production, although the rising share of petroleum in 1977 is mainly attributable to rising oil prices. The rate of dispersion in non-durable goods in the 1970s does not show the same pattern of steady decline that has been exhibited by other industry groups, again partly because of the rise in oil prices.

INCREASED INTERNATIONAL COMPETITION

As shown earlier, in Table 4, international competition is now of greatly increased importance to the U.S. economy. After World War II, U.S. exports represented less than 4 percent of its GNP, but they dominated worldwide trade volume. Now exports are more important to the U.S. economy, but represent a lower percentage of world trade.

The loss of export markets, and often the loss of part of the domestic market to imports, has been caused by both internal and external events. Internally, U.S. trade problems can be traced partly to the problems of maturing industries and partly to high production costs relative to international competitors. In some cases U.S. firms have begun producing abroad to achieve lower costs. This is consistent with the life-cycle view, which holds that, as an industry matures and its technology becomes

TABLE 7. STEEL INDUSTRY HOURLY EMPLOYMENT COSTS IN THE UNITED STATES AND FOUR OTHER COUNTRIES

	United States	Japan	West Germany	France	United Kingdom
Absolute Levels (In current dollars)					
1969	5.54	1.65	2.36	2.19	1.66
1972	7.33	2.86	4.24	3.46	2.62
1975	10.83	5.54	7.61	7.23	4.57
1978	14.73	9.44	11.55	10.56	5.93
1981	20.78	11.57	13.18	12.65	9.56
1982 (projected)	24.42	11.03	13.35	12.39	9.23
Annual Percentage Rates of Growth, 1969-1981					
In dollars	11.6	17.6	15.4	15.7	15.7
In home currency	11.6	13.0	10.2	16.2	17.3

SOURCE: Donald F. Barnett and Louis Schorsch, Steel: Upheaval in a Basic Industry (Ballinger, 1983).

standardized, the ability of low-wage countries to enter the industry increases. ^{4/}

Wage rigidities and high labor costs are frequently cited as one of the most intractable features of today's economy. In the steel industry, for example, hourly employment costs (as shown in Table 7) are the highest in the world. Steel workers in most countries are generally paid a premium, partly because of their high skill and productivity, but the differential is greater in the United States than elsewhere. In the 1980s, steel workers in the United States had total hourly compensation nearly 80 percent higher than the manufacturing average, while their French and German counterparts exceeded the manufacturing average by less than 20 percent.

4. See Raymond Vernon, "International Investment and International Trade in the Product Cycle."

It should be noted that wage comparisons can be misleading. First, differences in human capital, and therefore skill levels, make such comparisons difficult. Second, and more important, unit labor costs, which reflect the productivity of labor, are more significant as a measure of competitiveness than hourly earnings. As shown in Table 7, hourly employment costs for U.S. steelmakers actually grew more slowly from 1969 to 1972 than in other countries. At the same time, however, labor productivity was increasing faster elsewhere, particularly in Japan, putting the U.S. steel industry at an increasing disadvantage on a unit labor cost basis. Unlike steel, employment costs in many U.S. manufacturing industries fell during the 1970s, relative to foreign levels, as productivity and unit labor cost differentials narrowed internationally.

Externally, the revival of the European and Japanese economies after World War II meant that U.S. predominance in international trade could not continue indefinitely. As these countries regained their industrial capacity, the U.S. share of world markets had to decline. Moreover, after the devastation of the war, the Europeans and Japanese could rebuild their capital stocks to embody newer, more efficient techniques. The adoption abroad of the basic oxygen furnace in steel production is an often-cited example. In addition, when foreign countries started producing some of the products new to the postwar period, such as televisions, they were able to avoid large research and development expenditures by simply reproducing U.S. technology. The level of international competition has also increased as newly industrializing nations have enlarged their manufacturing capabilities in the last decade. Korean and Brazilian steel, for example, are now pushing into an already crowded steel market.

The composition of U.S. exports and imports for the period 1960-1980 is shown in Table 8. Despite the volume and share changes cited above, there has been considerable stability in the composition of exports over this period. Fluctuations stem largely from changing world conditions of supply. Agriculture, though a mature industry, has maintained its share of exports due, in part, to high productivity growth. Both exports and imports of machinery and transportation equipment have risen since 1960, reflecting rising world trade in these goods in general and the growing parity of Western Europe and Japanese producers. Within this category some high technology items, such as computers, have shown exceptional export growth, while others, such as metal-working and textile machinery, have shrunk in their share of exports. Imports of mineral fuels and transportation equipment have increased, largely because of increased petroleum and automobile imports.

TABLE 8. COMPOSITION OF U.S. EXPORTS AND IMPORTS,
1960-1980 (In percent of dollar value in each year) a/

	1960	1965	1970	1975	1980
Exports					
Food and live animals	13.2	14.7	10.2	14.6	12.8
Beverages and tobacco	2.4	1.9	1.6	1.2	1.2
Crude materials (inedible)	13.7	10.5	10.8	9.2	11.0
Mineral fuels and related materials	4.1	3.5	3.7	4.2	3.7
Chemicals	8.7	8.8	9.0	8.2	9.6
Machinery and transportation equipment	34.3	37.3	42.0	43.0	39.1
Other manufactured goods	18.7	18.0	17.9	15.6	17.8
Imports					
Food and live animals	19.9	16.1	13.5	8.8	6.4
Beverages and tobacco	2.6	2.6	2.1	1.5	1.1
Crude materials (inedible)	18.3	14.5	8.3	5.8	4.3
Mineral fuels and related materials	10.5	10.4	7.7	27.5	33.9
Chemicals	5.3	3.6	3.6	3.8	3.5
Machinery and transportation equipment	9.7	13.8	28.0	24.4	24.7
Other manufactured goods	30.3	35.1	33.3	24.9	22.9

SOURCE: U.S. Department of Commerce.

- a. Numbers do not add to 100 percent because the categories are not exhaustive.

THE EXPANSION OF THE LABOR FORCE

The civilian labor force grew by 26.8 percent in the 1970s. Over the same period the proportion of the population participating in the labor force rose from 60.4 percent to 63.7 percent--largely because more women sought

jobs. ^{5/} This meant that the increase in employment during the 1970s was consistent with an increase in the rate of unemployment--a combination of trends that created difficult choices for national policymakers.

Most of the additional workers were absorbed into the service and government sector, many in low-productivity, low-wage jobs. Only 8.5 percent of the new jobs in 1970-1979 were in the higher paid manufacturing sector.

The expansion of the labor force coincided with the movement of younger workers from the postwar baby boom generation into the labor force. The percentage of workers under age 35 jumped from 37 percent in 1960 to 50 percent in 1977. ^{6/} This demographic shift has been linked to many of the problems of the economy, since younger workers tend to have lower productivity, lower earnings, and higher unemployment rates. In addition, they consume a different market basket of goods from the population average, including more education, housing, and first-purchase consumer durables.

THE OIL CRISIS OF THE 1970s

The Arab oil embargo and subsequent rise in oil prices had obvious and directly harmful effects on the U.S. economy. Higher prices for imported oil had to translate, in one form or another, into lower living standards for the nation as a whole.

Industries were affected unequally by the oil price increases, since much of the nation's capital stock had been designed to meet a different relative price structure. Energy-intensive production processes suffered more than others. Large adjustment costs were imposed on the economy, as a significant proportion of the capital stock was rendered obsolete. The higher oil prices increased the demand for fuel-efficient cars, enabling foreign producers to capture large portions of Detroit's automobile markets. The energy crisis also increased uncertainty about inflation in general and the future structure of prices. Uncertainty of this sort makes entrepreneurs less willing to undertake specialized capital investment, and encourages

5. Department of Labor, Bureau of Labor Statistics.

6. See "Evaluation of the American Labor Market, 1948-1980," by Richard B. Freeman, in Martin Feldstein, ed., The American Economy in Transition (1980).

investment in short-term capital assets rather than in plant and equipment. ^{7/}

PRODUCTIVITY AND CAPITAL FORMATION

One of the most significant economic events of the 1970s, and one of the most widely discussed, was the slowdown in productivity growth. Table 9 provides a breakdown of labor productivity growth rates. The decline in productivity growth rates has been broadly based, although in manufacturing it has been less than in the rest of the nonfarm economy.

TABLE 9. LABOR PRODUCTIVITY GROWTH RATES IN THE UNITED STATES, BY SECTOR, SELECTED PERIODS, 1947-1981
(Percent changes at annual rates)

Periods	Total Private Business	Total Nonfarm Business	Manufacturing
1947-1955	3.5	2.7	3.6
1955-1965	3.0	2.6	2.8
1965-1973	2.2	1.9	2.4
1973-1981	0.8	0.6	1.5

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics. See also Congressional Budget Office, The Productivity Problem: Alternatives for Action (1981).

Some of the causes of the productivity slowdown have already been reviewed. The exhaustion of technological possibilities as industries mature, the de facto depreciation of the capital stock due to the oil crisis, the expansion of the labor force, and the diffusion of investment abroad all

7. Martin Neil Bailey, "Productivity and the Services of Capital and Labor," Brookings Papers on Economic Activity, 1:1981, pp. 1-50.

account for some part of the decline. But these factors hardly account for all of the decline. Some of it may be attributed to the slow growth of the economy, which has led many industries to delay the adoption of new production techniques since their current equipment was able to satisfy the low existing demand. In this way, sluggish productivity and slow growth reinforce each other until the effects are felt throughout the economy.

One of the more important consequences of the slowdown in productivity growth is that U.S. manufactured goods must compete, both internationally and domestically, against foreign goods, some of which are experiencing higher rates of productivity growth. In Japan, for example, productivity in manufacturing grew 6.8 percent a year from 1973 to 1980. Japan has had the advantage of being a late starter in many industries, and could often acquire technology rather than develop it. It has also benefited from policies aimed at maintaining high rates of industrial change (except in agriculture).

Some of the decline in average U.S. productivity growth can be explained by the increased importance of services, where productivity growth is low (and difficult to measure), and even by the compositional shifts of employment among manufacturing industries. When labor shifts from high-productivity to low-productivity industries, its aggregate productivity falls even if the low-productivity industries have high productivity growth rates. The net effect of interindustry shifts of labor on productivity growth since the war has been positive, but has declined over the years. Interindustry shifts accounted for 0.47 percentage point of the aggregate productivity growth rate in the 1949-1965 period, but only 0.15 percentage point in the 1974-1978 period. ^{8/}

As the United States shifted from a predominantly agricultural economy to a predominantly manufacturing one, labor moved from relatively low-productivity employment to high-productivity employment, even as rates of productivity growth were increasing in agriculture. The current situation is more uncertain. Productivity in the manufacturing sector is about equal to the average level of productivity for the economy as a whole. Sectoral and interindustry shifts will help determine future productivity changes. Higher-than-average productivity sectors include: communications; electric, gas, and sanitary services; and finance, insurance, and real estate. In

8. Congressional Budget Office, The Productivity Problem: Alternatives for Action (1981), p. 116. See the same chapter for a general discussion of interindustry and intersectoral productivity levels and growth.

manufacturing, higher-than-average productivity industries include: tobacco; petroleum and coal products; and motor vehicles.

Closely connected to productivity growth is the rate of capital formation in the economy. Capital investment is one of the necessary elements in raising labor productivity since new plant and equipment often embody newer, more productive technology. The United States has, however, one of the lowest rates of gross investment among the world's industrialized countries, as shown in Table 10.

TABLE 10. GROSS FIXED CAPITAL FORMATION (As a percentage of gross domestic product)

	1960	1965	1970	1975	1980
United States	17.9	18.8	17.6	17.0	18.2
Japan	29.5	29.9	35.5	32.4	32.0
Germany	24.3	26.1	25.6	20.7	23.6
Total OECD Countries Minus United States	22.1	23.8	25.3	24.2	23.6

SOURCE: Organization for Economic Cooperation and Development (OECD).

More important, the growth rate of the net capital stock, after allowing for depreciation, has increased only slowly over the last decade. The net stock of capital is a more significant measure of potential economic strength than gross investment because it provides a better measure of usable plant and equipment. Most scholarly analyses have concluded that the recent growth rate trend has been downward. (See, for example, Table 11).

TABLE 11. RATES OF GROWTH OF THE CAPITAL STOCK, TOTAL AND EXCLUDING POLLUTION-ABATEMENT CAPITAL, BY SECTOR, SELECTED PERIODS, 1948-78 (Average annual percent increases) a/

Sector	1948-1965		1965-1973		1973-1978	
	Total	Excluding Pollution Abatement Capital	Total	Excluding Pollution Abatement Capital	Total	Excluding Pollution Abatement Capital
Private Business	3.14	3.11	4.48	4.37	2.31	2.05
Private Nonfarm Business	3.24	3.21	4.59	4.47	2.37	2.09
Manufacturing	2.93	2.86	3.93	3.64	2.16	1.47

SOURCE: From J. R. Norsworthy, Michael J. Hayes, and Kent Kunze, "The Slowdown in Productivity Growth: Analysis of Some Contributing Factors," Brookings Papers on Economic Activity, 1979:2.

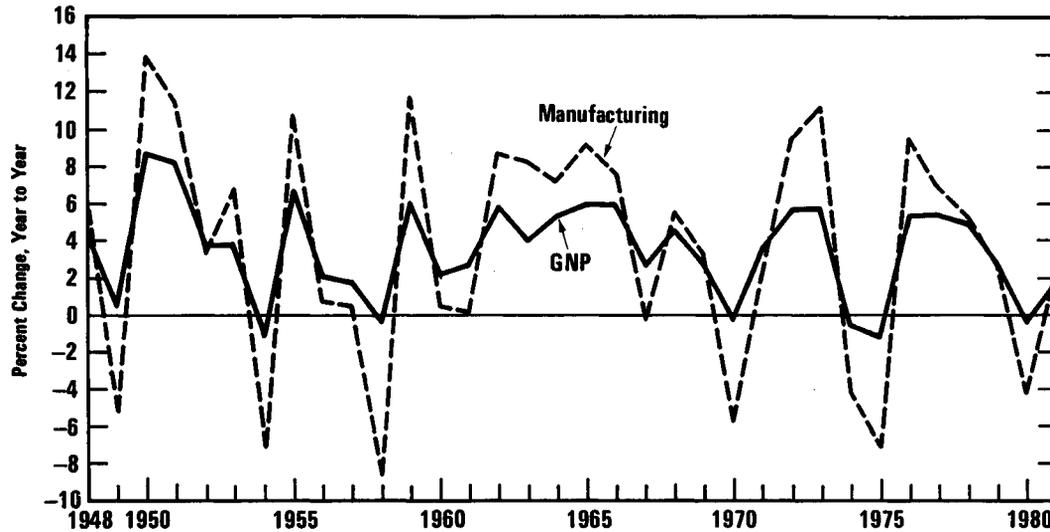
- a. Computed using data from the Bureau of Economic Analysis. The aggregates are based on direct aggregation of capital stocks.

CYCLICAL SWINGS

Since 1948, the economy has experienced six recessions. Figure 1 shows changes in the growth rate of real output and of manufacturing output (which is even more volatile, on average, than the rest of the economy). Both total output and manufacturing output have shown apparent increases in frequency and amplitude of cyclical growth since 1969. The current period (1970-1981) resembles the highly volatile 1950s more than the stable growth years of the 1960s. (This may mean only that the absence of cycles in the 1960s was an anomaly.)

The 1970s were characterized by two major recessionary periods, in 1974-1975 and 1979-1982, and a third, milder downturn in 1970, all of which were accompanied by a significant decline in manufactured output. In all

Figure 1.
 Percent Changes in Real Gross National Product and
 Manufacturing Output, 1948-1981



SOURCE: Department of Commerce, Bureau of Economic Analysis.

cases, the percentage changes in real growth experienced in the manufacturing sector were significantly greater than those experienced by the rest of the economy. Thus as the economy became more recession-prone in the 1970s, manufacturing was hit especially hard.

The cyclical swings of the economy in the 1970s reflected underlying events. The oil price shocks, for example, made it more difficult to control inflation, and higher inflation led ultimately to severe countermeasures that forced the economy into deeper recession than would otherwise have been tolerated. Similarly, the significant increase in the U.S. labor force made it more difficult to reach any target level of unemployment without unleashing inflationary pressure.

REGIONAL SHIFTS

Also characteristic of the 1970s were geographic movements in population and employment. The South and the West experienced exceptional rates of growth in population and manufacturing employment while the Northeast and Midwest lagged behind and even declined (see Table 12).

TABLE 12. REGIONAL CHANGES IN POPULATION AND MANUFACTURING EMPLOYMENT, 1976-1980 (Totals in thousands and growth in percent)

Regions	Population		Manufacturing Jobs	
	1981 Total	5-Year Growth	1981 Total	5-Year Growth
Northeast	54,813	0.0	5,330	2.5
New England	12,444	2.0	1,510	11.7
Middle Atlantic	42,369	-0.5	3,820	-0.7
Midwest	58,893	2.2	5,895	-2.5
Great Lakes	41,656	1.8	4,546	-4.7
Great Plains	17,237	2.6	1,349	5.9
South	71,452	12.4	5,813	11.9
South Atlantic	32,259	13.1	2,715	10.0
South Central	39,193	11.8	3,098	13.6
West	44,150	14.5	3,133	21.7
Mountain	11,694	19.1	574	27.8
Pacific	32,456	12.9	2,559	20.4
Total U.S.	229,307	6.8	20,171	6.1

SOURCE: Massachusetts Division of Employment Security.

Much of the regional displacement can be explained in terms of the industrial base within each region. Regions with old core manufacturing industries, such as the Middle Atlantic and Middle West, experienced job losses. In areas of the country associated with the steel industry, employment losses were particularly severe. States with more diversified economic bases, particularly in the expanding high-technology industries, did relatively better.

Regional shifts in employment also reflect other factors. Firms have expanded more in the South and West in part because labor is cheaper there. Areas have grown rapidly when they have demonstrated that they have a combination of resources and skilled labor that cannot easily be found elsewhere.

CONCLUSION

The problems confronting the U.S. economy have a variety of causes: declining productivity growth, high unemployment, declining industries, and cyclical instability. By historical standards, the economy's performance has been disappointing. On the other hand, it has not been bad in comparison with other industrialized countries, particularly those in Europe. From 1973 to 1980, real gross domestic product grew at an annual rate of 2.3 percent, compared to 2.2 percent in France, Germany, Italy, and the United Kingdom.^{9/} Moreover, two of the main causes of the economic problems discussed above may have been removed: OPEC's bargaining power seems to have been weakened as new sources of supply have entered the oil market; and labor force growth has stabilized and should not be a problem for the foreseeable future.

The policy issue raised by these data is whether the traditional tools of fiscal and monetary policy are sufficient to address today's economic conditions. Those tools are generally thought to be better adapted to helping the economy recover from recession or slowing inflationary tendencies than to raising productivity or changing the composition of output. But if there is no solution to the productivity dilemma, economic growth may be limited by resource and production bottlenecks. If the United States cannot find new exportable products, growth may be limited by trade deficits. And even if fiscal and monetary policies succeed in stimulating long-term capital investment, they may not cure all of the structural problems. Where industries are technologically mature, the return on new investment may be too low to induce entrepreneurs to put financial resources into new plant and equipment.

These considerations have led some to propose encouraging new industries and aiding technological development in mature industries. Such policies would probably require a greater degree of government intervention in the economy than heretofore. The next chapter examines present federal policies toward industry. In the subsequent two chapters, alternatives to the present policies are defined and analyzed.

9. Council of Economic Advisers, Economic Report of the President (February 1983).

CHAPTER III U.S. POLICIES TOWARD INDUSTRY

While the United States does not have an explicit industrial policy, it has a variety of ad hoc policies toward industry in general. Many are aimed at redressing the kinds of problems discussed in Chapter II. Others are directed toward some other primary goal (such as national defense), so that their industrial consequences are a secondary result.

Some of these policies may have become outdated. U.S. antitrust policies, for example, were designed around the turn of the century, before domestic industries faced the substantial international competition they face today. Similarly, many banking regulations were a reaction to the stock market crash of 1929 and the subsequent bank failures. Military procurement, with its related research and development expenditures, reached a peak in the Second World War although it continues to be significant.

The market system remains, however, the basis of the U.S. economy. As a decentralized means of economic decision making, markets have the advantage of being consistent with American political preferences. They heighten the independence and responsibility of the individual, promote resourcefulness, and widen opportunities. Decentralization also means that decision makers are close to the objects of their decisions and presumably knowledgeable about them and able to adapt rapidly to changing conditions. Americans rely upon the market to determine economic activity except under special circumstances.

Exceptions to the rule include policies to achieve full employment, correct so-called market failures, regulate the way in which business is carried on, and deal with international trade. This chapter examines some of the ways in which current policies affect industrial activity in the areas of procurement, trade, research and development, economic adjustment, regional economic assistance, and competition. It describes the purpose and impact of those policies and the issues surrounding them. ¹/

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1. This chapter does not attempt to provide a full listing of all the industrial support activities undertaken by the federal government, particularly of tax benefits and credit programs. For a fuller analysis of these activities and an examination of the federal budget for industrial support, see the forthcoming CBO publication on federal support of U.S. business.

PROCUREMENT

In fiscal year 1983, the federal government spent an estimated \$58.2 billion on major equipment acquisitions, only \$1.7 billion of which was for nondefense purchases. ^{2/} To this must be added much of the spending for research and development programs (discussed below), in the development of the space shuttle and many weapons systems. Such R&D shares the characteristics of acquisition programs insofar as it affects supplier industries. Together, these programs provide a major source of support for U.S. manufacturing industries.

According to Department of Defense data, in 1980 the defense share of industry output as a result of weapons purchases was 56.8 percent of aircraft engines and parts, 53.6 percent of shipbuilding and repairing, 32.7 percent of radio and television communication equipment, and 25.7 percent of engineering and scientific instruments. ^{3/}

The impact of federal government acquisition programs is most significant during the early phases of a product's development. In 1954, the government accounted for 100 percent of all computer purchases. From the mid-1950s through the 1960s, the government bought over 40 percent of all semiconductor purchases. In 1980, for the first time, government purchases fell below 50 percent of total aircraft sales.

In addition to federal acquisition programs, the federal share of public works infrastructure expenditures (on highways, public transit systems, wastewater treatment works, water resources, air traffic control, airports, and municipal water supply) currently cost an estimated \$24 billion a year. ^{4/} These programs are essential ingredients of long-term economic growth and have direct effects on the long-term viability of the nation's manufacturing base in addition to their short-term impacts on employment and local economic activity. Government policies, particularly infrastructure policies, often conform to the developing industrial structure, occasionally helping to shape the structure. A notable example has been the

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2. Budget of the United States Government, Fiscal Year 1984, Special Analysis D, "Investment, Operating, and Other Federal Outlays."
 3. U.S. Department of Defense, Program Analysis and Evaluation, Defense Economic Impact Modeling System.
 4. For further details on infrastructure and future needs, see Congressional Budget Office, Public Works Infrastructure: Policy Considerations for the 1980s (April 1983).

federal financing of canal, railroad, highway, and air transportation systems. Federal support for these projects aided regional economic growth (including suburbanization and westward development) as well as the growth of related industries such as autos, and of auxiliary industries such as construction.

TRADE PROGRAMS

In response to the increasing importance of international trade, the federal government has developed several programs to promote exports and to aid industries and individuals affected by increased imports. Two of the most significant manufacturing export promotion programs backed by the federal government are the Export-Import Bank and the tax benefits associated with Domestic International Sales Corporations (DISCS).

Promotion of Exports

The Export-Import Bank provides loans and loan guarantees to foreign companies or countries so that they can buy American goods. It provides loans for transactions that would presumably otherwise not occur because of the size, terms, or risks of such loans. In fiscal year 1982, Eximbank incurred new obligations of \$3.5 billion and net outlays of \$763 million; new guaranteed loan commitments equaled \$5.8 billion.

The DISC program attempts to increase exports through a system of tax deferrals. The object is to increase the rate of return for the exporter, much as does the system of value-added taxes in other countries. In the European Community, for instance, value-added taxes placed on all phases of production are rebated on exports to reduce production costs for exporters. However, despite the DISC program's similarity to other countries' export promotion programs, it has been ruled illegal under the General Agreement on Tariffs and Trade (GATT). The Administration is in the process of developing a system similar to DISC that abides by GATT rules.

A third program to encourage exports is contained in the 1982 Export Trading Act. It encourages the formation of businesses strictly for the export of goods and services produced by other firms. It is aimed at stimulating small and medium-sized U.S. firms to enter trading markets and is modeled after similar institutions in other countries. Over two-thirds of Japan's exports pass through export trading companies. The act specifically removes two obstacles to the formation of such companies by allowing them to be certified against antitrust prosecution and permitting banks to own and invest in these companies.

Finally, the Administration has recently proposed to create a new Department of Trade and Industry by combining functions of the Office of the Special Trade Representative and the Commerce Department. The purpose would be to concentrate government resources and policymaking machinery on trade policy problems.

Protection Against Imports

The other side of the trade promotion coin deals with imports, through measures to protect domestic firms against foreign competition and to assist them in adjusting to such competition. The government has taken steps in a variety of industries to slow down the flow of imports and to allow firms to adjust to change. In many cases, however, the mechanisms chosen serve to retard change rather than encourage it.

Among the programs are: the Trigger Price Mechanism for steel imports, and "voluntary" quotas for foreign steel exporters; indirect federal aid to the auto industry through deferral and revision of environmental and safety regulations, as well as direct aid in the form of negotiated "voluntary" restraints on Japanese auto exports and loan guarantees made available to the Chrysler Corporation; the Footwear Industry Revitalization Program, which included loans and loan guarantees, technical assistance, and other forms of support; assistance to the textile and apparel industries through high tariffs, negotiated international agreements, loan guarantees, and other technical assistance; and most recently, protection for the motorcycle and specialty steel industries, which have petitioned for assistance on the ground that they have been damaged by imports. Other industries now petitioning for assistance include the machine tool and semiconductor industries.

RESEARCH AND DEVELOPMENT

Research and development programs offer an example of what economists call positive externalities--that is, their social benefits exceed their private benefits. This is most true in the case of basic research, which does not allow the researcher to reap the full economic returns to the work and which is quite risky and expensive to undertake. As a consequence, the market tends to underinvest in basic research activities. The Congress has intervened to correct this situation by supplementing private support for research, particularly through the National Science Foundation. In addition, the government also funds mission-oriented R&D through agency and departmental budgets. In many cases, the federal government has supported very expensive development projects by building facilities and testing prototypes, particularly in defense and energy-related products.

Total federal government spending for all types of R&D was \$38.7 billion in fiscal year 1983. In addition, approximately \$2.4 billion in tax revenues were forgone as a result of legislation encouraging private firms and individuals to increase spending on R&D. Overall, about half of U.S. R&D funding has been provided by the government through its system of grants for university research, the use of government laboratories, subsidies for risky ventures, and support for specific projects. Government R&D support is concentrated among a few major industries, particularly those related to national security. Federal funds have played a major role in the development of defense-oriented industries such as aerospace, communication equipment, nuclear energy, and computers. Government R&D support has also played a major role in some civilian sectors of the economy--agriculture being the outstanding example. In fact, many of the most competitive industries have received the lion's share of federal R&D monies.

Many features of the tax system directly encourage private expenditures for research and development. For example, the investment tax credit, accelerated depreciation schedules, and some small-business incentives lower the cost of plant and equipment expenditures. This allows the results of R&D to be embodied more quickly in new products and processes. In addition, the tax code provides firms with the choice of immediately writing off the labor and materials cost of R&D activities, excluding capital equipment, or depreciating those costs over five years. The option to expense R&D costs in the first year provides a significant incentive to engage in R&D activities. The Economic Recovery Tax Act of 1981 provided more incentives for R&D by giving an incremental tax credit for additional R&D expenditures. 5/

ECONOMIC ADJUSTMENT

In cases of severe economic disruption, the federal government has initiated adjustment programs to ease the transition and to improve social welfare. These include trade adjustment assistance and labor training programs; economic conversion programs undertaken by the military for base closures; and programs for energy conservation and conversion. Such programs are industrial policy-oriented in that they address the goal of facilitating change by providing assistance to ease that change.

5. This subject will be treated in more detail in a forthcoming CBO publication.

The Reconstruction Finance Corporation

Probably the most active program of economic adjustment undertaken by the federal government was the Reconstruction Finance Corporation (RFC). Originally established in 1932 to refinance failing banks and railroads, it became, under the New Deal, a major source of industrial financing for relief and recovery programs during the Depression and for procurement of strategic materials during World War II. When it was terminated in 1953, some of its financing functions were continued by other agencies such as the Commodity Credit Corporation, the Small Business Administration, the Export-Import Bank, and the Federal National Mortgage Association. Although originally run according to conservative banking practices, its later lending activities were often considered to be of more political than economic value.

Displaced Workers

The most recent initiative for providing adjustment assistance to displaced workers is Title III of the Job Training Partnership Act (JTPA) of 1982. The JTPA is a federally funded, state-administered program to provide job search, counseling, retraining, and relocation assistance to workers laid off with little chance of reemployment in their former jobs, to victims of plant closings and plant relocations, and to the long-term unemployed, especially older workers. The program is funded on a yearly basis at approximately \$225 million. These resources, in combination with state matching funds, are expected to help about 100,000 displaced workers.

The JTPA largely replaces the Trade Adjustment Assistance Program (TAA), which from 1974 to 1983 was the major program for providing adjustment assistance to workers harmed by foreign competition. Although the TAA program was recently reauthorized by the Congress, its budget authority and program scope have been significantly curtailed in recognition of the benefits now provided by the JTPA. The TAA program now offers income replacement benefits, training and related services, and job search and relocation allowances to workers unemployed because of import competition. The income benefits are equivalent to a worker's state unemployment insurance benefit, and become available only after those benefits have been exhausted.

REGIONAL ECONOMIC ASSISTANCE

Since the Reconstruction Finance Corporation was disbanded in 1953, the federal government has undertaken several programs designed to aid