

The advantages of such a financial institution would lie in its ability to address structural problems that are outside the reach of fiscal, monetary, and existing policy instruments. It would be justified to the extent that the financial market fails to meet the capital requirements of industry, particularly the needs of distressed firms or regions, or to provide capital for the reorganization of troubled industries.

The key question about such an institution is whether it would yield better overall economic performance than the unassisted marketplace. A new institution, reallocating financial resources, could create serious inefficiencies if it were to make poor decisions. A related risk is that it would further politicize the economic system by introducing an element of political negotiation into economic decisions. This risk may be small if current policy is already seen as politicized by the numerous government involvements in the economy. A new institution might serve to make such involvement more consistent and straightforward if it replaced, but did not add to, some of the interventions under current policy. The capitalization of the institution would also be an important factor. A small development bank would have only marginal effects on resource allocation. A large, permanent institution would be likely to become a magnet for special-interest pleadings, and could provide an incentive for poorly managed firms to fail in such a way as to require bailing out.

Much would depend on whether the mission of the agency was defined as promoting growth industries or as subsidizing the restructuring of declining industries. Some would argue that promoting growth industries could contribute to higher output, productivity, and employment. But given the apparent willingness of U.S. capital markets to provide funds, these industries may not need financial assistance. If the mission was to restructure mature industries, the case for the agency would be its ability to promote actions that individual enterprises cannot pursue on their own, such as coordinated capacity reductions or industrywide modernization. A federal financial institution could enforce the necessary sharing of the burden, as the government was able to do in the Chrysler and New York City cases.

Such a financial institution would be under considerable political pressure. Rather than fostering industrial development, it could end up subsidizing inefficient industries to maintain employment. Extraordinary discipline would be required to avoid this--specifically, a firm policy of noninterference in the agency's decision making.

CONCLUSIONS

All of the options put forward carry economic or political costs that are not easy to assess in advance. A weakness of the industrial policy debate is that too much attention has been given to the competing proposals and not enough to defining the problems and the desired outcomes. As the Organization for Economic Cooperation and Development warned several years ago, the costs should be made as explicit as possible.^{2/} "Careful attention should be paid to the cost to consumers of action which raises prices, to the cost to taxpayers, and to the effects of subsidized competition on employment elsewhere."

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2. Organization for Economic Cooperation and Development, The Case for Positive Adjustment Policies (June 1979).

CHAPTER I. INTRODUCTION AND OVERVIEW

This study examines the issues underlying the industrial policy debate. Among these are: what to do about industries that appear to be declining in international competitiveness; how committed the United States ought to remain to the principles of free trade; what actions, if any, to take to promote particular types of industry; how best to provide for the needs of workers and communities affected by plant closings; and to what extent government should be entrusted to make and carry out economic decisions for the common good. All of these questions come together under the rubric of "industrial policy."

THE INDUSTRIAL POLICY DEBATE

Much has been written about declining American industries and whether the federal government should actively promote industrial rebuilding. ¹/ The debate has been fueled by the recent recession, with its impact on many manufacturing industries, although basic concerns go much deeper than that. On the one side stand supporters of a new activist industrial policy who would have government intervene more in support of business activity. On the other side stand those who would prefer to use current policy tools to achieve economic goals, together with free-market advocates who argue that the government already interferes too much in the economy and that it could aid business more by doing less.

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1. Ira Magaziner and Robert Reich, Minding America's Business (Harcourt Brace Jovanovich, 1982); Amitai Etzioni, An Immodest Agenda: Rebuilding America Before the Twenty-First Century (New Press, McGraw Hill, 1983); Barry Bluestone and Bennet Harrison, The De-Industrialization of America (Basic Books, 1982); Michael Wachter and Susan Wachter, eds., Toward a New U.S. Industrial Policy? (University of Pennsylvania Press, 1981), F. Gerard Adams and Lawrence R. Klein, eds., Industrial Policies for Growth and Competitiveness (Lexington Books, 1983); Ronald Muller, Revitalizing America: Politics for Prosperity (Simon and Schuster, 1980).

Definitions

The term "industrial policy" is so new to American economic discourse that it has yet to acquire a specific meaning.^{2/} In its broadest sense, industrial policy encompasses everything that government does affecting business activity, from fiscal and monetary policy to Chrysler loan guarantees. But the term is not used to mean just any policy affecting industry. Rather, it implies: (1) a focus on long-term structural economic problems; and (2) an emphasis on industries or sectors of the economy, particularly on the manufacturing sector and its role in energizing the rest of the economy.

For the most part, industrial policy advocates concede that monetary and fiscal policies should remain predominant tools of economic management. However, to the extent that these are unable to ensure high employment or fail to stimulate long-term economic growth, industrial policies may be called upon to assist. Put differently, the argument for an industrial policy is that short-term problems, such as those caused by high interest rates or unfavorable exchange rates, are best addressed by macro-economic policy, while long-run, secular problems may not be.

In the narrowest sense, industrial policy may be thought of as applying primarily to the manufacturing sector, including efforts to move resources into and out of manufacturing. In this sense it would be on a par with other sectoral policies toward agriculture, financial institutions, transportation, and energy. A broader conception takes the view that important economic developments cannot be neatly confined to individual sectors. The development of the computer industry, for example, has involved nearly all economic sectors. But the distinguishing feature of industrial policy is its structural emphasis. Where macroeconomic policy focuses on broad aggregates and on the cyclical behavior of the economy, industrial policy looks at the composition of the aggregates and at long-term growth.

Goals

Industrial policy advocates do not all share the same goals. Three major types of goals can be discerned in the emerging debate: improving overall economic growth; meeting foreign competition; and assisting workers and industries to adjust to economic change.

2. For a useful classification of industrial policy definitions see F. Gerard Adams and Lawrence Klein, eds., Industrial Policies for Growth and Competitiveness, pp. 14-19.

Macroeconomic Goals. The recessions and inflation of recent years have led some to argue that policies aimed at particular industries or sectors would help the economy to perform better in terms of employment, output, and price stability. 3/ They believe that current monetary and fiscal policy is inefficient. When it attempts to stimulate the economy to induce growth, it overstimulates some sectors that may already be operating at full capacity and understimulates others, thus contributing to inflation and creating additional structural imbalances. A converse effect occurs when policy is disinflationary, as sectors with slack capacity become further depressed. Moreover, to the extent that unemployment reflects changes in the demand for labor by particular sectors rather than by the economy as a whole, targeted industry policies may be needed to address the problem. 4/

Some proponents go further, arguing that the government should as a matter of policy have goals for sectors or industries as well as for the economy as a whole. 5/ These goals would specifically target the number and types of jobs or products the economy should produce. Some proposals to "save" particular industries, such as steel and automobiles, fall into this category. In particular, these proponents would try to reverse the decline in the number of middle-income jobs.

Competitive Goals. The desire to meet foreign competition leads to two types of proposals. On the level of general economic policy, it is argued that because other nations have industrial policies, so should the United States. 6/ The argument is partly based on a broad view of historical

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3. See William Diebold, Jr., Industrial Policy as an International Issue (McGraw-Hill, 1980), pp. 248-56; and Marc Bendick, Jr., "A Federal Entrepreneur? Industrial Policy and American Economic Revitalization," Urban Institute Working Paper 1525-01, March 1981.
 4. See David M. Lilien, "Sectoral Shifts and Cyclical Unemployment," Journal of Political Economy, vol. 90, no. 4 (1982).
 5. This seems to be a major point in Felix Rohatyn's program. See for example, "Time for a Change," New York Review of Books, August 18, 1983, pp. 46-49. See also Samuel Bowles, David M. Gordon, and Thomas E. Weisskopf, Beyond the Waste Land (Anehor Press/Double-day, 1983).
 6. See for example, The Labor-Industry Coalition for International Trade, (LICIT), International Trade, Industrial Policies, and the Future of American Industry (1983).

necessity (the United States must keep pace with modern institutional developments or fall behind) and partly on the belief that if foreign governments are targeting our industries, we should retaliate.

On the level of specific products, the argument is more straightforward and more clearly protectionist. In order to remain competitive in certain products, especially in cases where other governments subsidize exports, the United States should provide both financial and technical assistance to industry.^{7/} The argument recognizes that consumers may benefit in the short run from imports subsidized by foreign governments, but holds that protection is justified by short-run adjustment problems caused by changes in foreign subsidies and by long-run considerations of maintaining a national industrial base and promoting competition. In addition, some argue that the government should assist vital domestic industries for reasons of national security.

Adjustment Goals. A third industrial policy goal is to assist workers, firms, or communities in adjusting to economic change.^{8/} Its exponents point out that this was done for the agricultural sector (for example, the commodity support and agricultural credit programs) when it experienced disruptions as resources were shifted from agriculture to manufacturing, largely as a result of vastly improved efficiency in agriculture and increased demand for labor in manufacturing. Between 1920 and 1947, total farm employment declined from 13.4 to 10.4 million. Now some manufacturing industries are also experiencing employment declines, although they differ in pace, scope, and magnitude. Total employment in steel, for example, fell from 584,000 in 1965 to 289,000 in 1982. Assisting the adjustment does not necessarily call for heavy government intervention. Some argue that the best approach would be to help speed up the process of change so the economy can more rapidly move to higher levels of productivity and efficiency, while ameliorating (or compensating) the pain of those who are adversely affected--for example, by giving adjustment assistance to unemployed workers.^{9/} Others argue that changes are taking place too fast for

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7. This argument also occurs in the LICIT study cited above, as well as in the petitions of Houdaille, Inc., the Machine Tool Builders Association, and numerous other firms filing with the International Trade Commission for protection against imports.
 8. See for example, Magaziner and Reich, Minding America's Business, pp. 343-50. See also Lester Thurow, The Zero-Sum Society (Basic Books, 1980).
 9. See Lester Thurow, The Zero-Sum Society.

individuals and communities to adjust and that government policy should try to slow down or, in extreme cases, even reverse the process of change. This might involve supporting industries that are now in decline, but that represent key linkages in the economy. 10/

What Role for Government?

The debate over industrial policy raises the question of what the legitimate mission of government should be vis-a-vis the economy. Since World War II, the Congress has given the federal government responsibility for creating and maintaining high levels of employment in the economy through fiscal and monetary policy. This role was reinforced and broadened by the Full Employment and Balanced Growth Act of 1978. Now the question is being posed whether government should take an even stronger and more interventionist role--a role that runs counter to many traditional American beliefs.

The debate is not new, even in the United States. Alexander Hamilton argued forcefully in his Report on Manufactures (1792) for a strong government role in the encouragement of U. S. industry. He opposed the popular theories of Adam Smith (The Wealth of Nations, 1776)--"that industry, if left to itself, will naturally find its way to the most useful and profitable employment" as if guided by an invisible hand to promote the general welfare. Hamilton offered four arguments against Smith: (1) that inhibitions and reluctance to change would prevent a spontaneous transition to new pursuits; (2) that the risk of failure in new endeavors would deter experimentation; (3) that infant U.S. industries could not be expected to compete effectively with mature foreign firms on equal terms; and, what Hamilton regarded as most important, (4) that other nations already offered subsidies and inducements to manufacturers that made competition unfair.

The debate is now being revived in a new context. Global recession has led many national governments to protectionist measures. In addition, increasing instability in the industrialized economies during the 1970s has made it riskier for businesses to take the initiative in adjusting to long-term changes in the structure of the economy. Moreover, the social cost of making such adjustments is high, as seen in double-digit unemployment rates

10. Felix Rohatyn makes this point in "Time for a Change" and numerous other articles and speeches.

and communities shattered by plant closings. It is natural to look for remedies in a better and more coherent government policy toward industry. 11/

Those who favor such a policy have to reckon with the anti-interventionist tradition in America. Unlike countries such as Japan and France, which have strong traditions of government direction of economic activity, each new proposal in the United States for government intervention revives a national debate on the extent to which government should be entrusted to make and carry out economic decisions. Government intervention in economic activity is generally recognized as being legitimate at the macroeconomic level in an effort to smooth business cycle fluctuations, curb inflation, promote income equality, and seek a high level of output and income, although even these goals are questioned by many who doubt government's ability to accomplish them. Also recognized, but more controversial, is the role of government as the regulator of economic activity in certain limited areas (such as antitrust legislation, public utility regulation, and equal opportunity requirements). But even at the macroeconomic level, the role of government is strictly circumscribed. In general, it is held that government should be even-handed; it should not tilt the playing field for some special interests and against others. Where the government must intervene, it should do so in the least obtrusive way. While these goals are often honored more in the breach than in the practice, the preference for markets and against unneeded intrusion by government is pervasive.

The new industrial policy activists, who would have the government target help to individual industries and firms, justify their stance on several grounds. First, they argue that some macroeconomic policies are not as even-handed as they appear to be. For example, the accelerated depreciation schedules created under the Economic Recovery Tax Act of 1981 (ERTA) may not have benefited the fast-changing high technology industries as much as some other industries. The electronics industry, for example, claims that it must depreciate equipment faster than the tax law now allows, because of rapidly changing technological advances, and that the old rules were more favorable. Clearly the system introduced under ERTA had the unintended effect of benefiting some industries more than others. By the same token, monetary policy has different effects on industries with different capital intensities and whose sales respond differently to changes in interest rates.

11. Along with this, however, has gone a movement toward industrial deregulation and the removal of government subsidies and other interventions that distort economic incentives.

Second, the interventionists note that the government also intervenes purposefully on the microeconomic level: through subsidized loan programs, encouragement of certain activities such as housing and medical care, farm price supports, tax incentives, and industry regulation. Such intervention has existed throughout American history.

On this basis, many activists would recommend that the government explicitly target industries or sectors rather than continue with ad hoc, piecemeal approaches. Some have even spoken of "picking winners and losers"--that is, helping firms that hold the most promise of success and rejecting those that are uncompetitive. Few would go this far, however; most would work with the competitive market, which itself determines survivors and decliners. Some also base their case on the traditional argument that government should help industries jeopardized by foreign competition. Specifically, they propose targeted subsidies to firms that are threatened by competition from foreign firms receiving unfair government assistance. Such intervention is held to be most effective on a case-by-case basis, matching countervailing assistance for domestic industry with foreign government subsidies to foreign firms.

At the core of these arguments is the issue of who should make economic decisions and who should bear the burden of risk. Free-market proponents argue that risk-bearing and decision making should be spread widely through the economy. They emphasize the advantage in having decisions made by those close to the scene of economic activity, who have an immediate stake in economic efficiency. They also see this as a hedge against the concentration of power in a few key centers, particularly in the government. They agree with Adam Smith that the individual pursuit of self-interest is the best determinant and provider of the public good. They also argue that if foreigners wish to subsidize exports to the United States, Americans should be content to enjoy the advantages of their generosity. The interventionists, on the other hand, lean toward the Hamiltonian view that today's industrial problems are too great to be borne by the individual enterprise alone. They would have government share some of the risks and make some of the decisions.

Those favoring a free market would argue that the burden of proof in this debate lies with the interventionists. Recent economic history demonstrates that economic problems may be more intractable than is commonly perceived, and that government may have less control over economic events, even at the macroeconomic level, than would be required for an interventionist industrial policy to succeed.

The Development of Consensus

To some extent, the industrial policy debate is really about a search for consensus on long-term economic policy direction. Economic policies need public support if they are to succeed. In the United States, the high-growth years of the 1960s coincided with (among other things) a consensus on the need to "get the economy going again." This period also saw the country engaged in putting a man on the moon, with the synergistic effects on industry resulting from that program. In Japan, Germany, and elsewhere, high-growth economic programs are associated in the public mind with national renaissance and "catching up to the United States."

One reason the current industrial policy debate lacks focus is the apparent disagreement among important groups on economic goals and the means to carry them out. The Keynesian consensus for managing the economy through fiscal policy began to evolve in the United States during the Great Depression and reached its height in the 1960s. It has been shaken by recent events, particularly the inability of conventional policy to address high inflation and high unemployment simultaneously. Frequent shifts in policy have created uncertainty and instability, thereby impeding sustained economic growth. The effects can be seen in high interest rates and the tendency of many firms to postpone long-term commitments.

The industrial policy debate offers several potential avenues for policy consensus. At one end of the spectrum are those who believe they know the direction in which the United States should be heading and advocate new institutions and policies to help it get there. At the other end are some who are less certain of solutions but suggest ways to develop new directions. The first group assumes a new consensus is emerging. The second sees no consensus developing as yet, but recognizes the need for one and therefore seeks to create new institutions and mechanisms for building it. The continuum between these extremes is filled with industrial policy proposals of various kinds.

PLAN OF THE STUDY

This study seeks to provide a framework for the industrial policy debate by first reviewing the economic changes that have precipitated the concern over America's industrial strength and then analyzing policies that would address the problem. The changing structure of U. S. industry is discussed in Chapter II. The ways in which the government now intervenes in markets to address economic problems are examined in Chapter III. Chapter IV describes alternative strategies: (1) to stay with current policies and rely on the benefits of sustained economic recovery to resolve industrial

problems; (2) to adapt existing policies to changing conditions; and (3) to develop new institutions to address industrial problems, establishing a new national policy toward industry. Chapter V evaluates these choices, with particular emphasis on the following questions:

- o To what extent would a given policy address structural economic problems?
- o To what degree might it politicize economic decision making?
- o What would be the consequences if it failed?

CHAPTER II. THE CHANGING STRUCTURE OF U.S. INDUSTRY

In recent years the U.S. economy has tended to become increasingly a service economy. The production of goods, while growing, has become a smaller part of total economic activity. This is not bad in itself. The U.S. standard of living remains among the highest in the world, and more Americans are working today than ever before. Still, high levels of unemployment, together with declining rates of productivity growth, raise questions about the future. This chapter examines some of the recent changes in the economy and their origins.

OVERVIEW

The most obvious change in the structure of the economy, as shown in Table 1, is in the proportions of final demand devoted to goods and services. In 1950, the goods/services ratio stood at 1.8:1. By 1980 it had fallen to half that, or 0.9:1. Over the last 30 years the value added by manufacturing as a percent of GNP has shown a steady decline, while finance and other services have increased (see Table 2). A comparable decline has taken place in manufacturing employment as a percent of total industry employment (see Table 3). The actual number of employees working in the manufacturing sector has remained about the same since 1969, while employment has increased in finance, services, trade, and government.

Such changes are not new in the history of the U.S. economy. The sectoral shift out of manufacturing and into services can be put in perspective by comparing it to the movement from agriculture to manufacturing earlier in the twentieth century. In 1920-1947 agricultural employment fell from 26.6 percent of total employment to 14.3 percent, or by an average of 1.7 percent per year. In a comparable span of time, 1950-1977, manufacturing employment declined from 29.1 percent to 22.0 percent of total employment, or by an average of 0.9 percent yearly. Of more significance is the drop in the rate of productivity growth (that is, the rate of increase in goods and services produced per hour worked) in the postwar period, especially in the last ten years. This rate has declined from 3 percent in 1948-1973 to less than 1 percent in 1973-1981.

The United States is now more closely tied to the international economy. As shown in Table 4, the share of GNP accounted for by imports and exports of goods has increased dramatically in the last 30 years. The

TABLE 1. GROSS NATIONAL PRODUCT BY MAJOR TYPE OF PRODUCT, 1950-1980 ^{a/}

	1950	1955	1960	1965	1970	1975	1980
Total GNP (In billions of nominal dollars)	286.5	400.0	506.5	691.1	992.7	1,549.2	2,631.7
Goods (In billions of nominal dollars)	162.4	214.5	254.2	338.4	459.9	694.0	1,140.6
Services (In billions of nominal dollars)	88.5	136.1	193.8	273.3	429.9	705.2	1,225.2
Structures (In billions of nominal dollars)	35.6	49.5	58.5	79.3	102.9	150.0	265.9
Goods/ Services (ratio)	1.8	1.6	1.3	1.2	1.1	1.0	0.9

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts.

a. As measured by final demand.

TABLE 2. SECTORAL COMPOSITION OF GROSS NATIONAL PRODUCT, a/ 1951-1977 (In percent) b/

Sector	1951	1955	1959	1964	1971	1977
Manufacturing	29.8	30.2	29.0	28.1	24.6	24.2
Other Goods Industries	14.9	12.7	11.3	10.1	9.4	9.8
Finance, Insurance, and Real Estate	10.6	12.5	13.8	14.3	14.5	14.4
Public Utilities, Transportation, and Communications	8.8	8.9	9.0	8.8	8.7	8.9
Wholesale and Retail Trade	17.0	16.6	16.8	16.4	16.8	16.8
Services <u>c/</u>	7.8	8.5	9.5	10.2	11.5	12.2
Government and Government Enterprises	9.3	9.6	10.2	11.2	13.2	12.4
Not Classified (Incl. error)	<u>1.6</u>	<u>1.0</u>	<u>0.4</u>	<u>0.9</u>	<u>1.2</u>	<u>1.3</u>
Total GNP <u>d/</u>	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE: U. S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts.

- a. As measured by gross product originating in each sector.
- b. The years chosen are midway between the peaks of the business cycle, to minimize cyclical distortion.
- c. Services are defined in the narrow sense of lodging, repair services, professional and business services, etc.
- d. Columns may not add to 100 because of rounding.

TABLE 3. SECTORAL COMPOSITION OF EMPLOYMENT, 1951-1977
(In percent)

Sector	1951	1955	1959	1964	1971	1977
Manufacturing	29.1	28.7	27.0	25.8	23.4	22.0
Other Goods Industries	10.8	10.0	9.5	8.5	7.3	7.1
Finance, Insurance, and Real Estate	3.5	3.9	4.2	4.4	4.7	5.1
Public Utilities, Transportation and Communications	7.6	7.1	6.5	5.9	5.6	5.2
Services	13.1	13.8	15.4	16.6	17.5	19.1
Wholesale and Retail Trade	17.6	17.7	18.0	18.4	19.6	20.8
Government and Government Enterprises	<u>18.5</u>	<u>19.1</u>	<u>19.6</u>	<u>20.6</u>	<u>21.8</u>	<u>20.6</u>
Total ^a /	100.0	100.0	100.0	100.0	100.0	100.0
Employment (In millions)	56.4	59.1	61.5	67.1	79.4	89.6

SOURCE: U. S. Department of Labor.

a. Columns may not add to 100 because of rounding.

TABLE 4. MERCHANDISE EXPORTS AND IMPORTS, 1950-1980

Year	Exports		Imports		Trade Balance	
	In Billions of Dollars	Percent of GNP	In Billions of Dollars	Percent of GNP	In Billions of Dollars	Percent of GNP
1950	10.20	3.6	-9.08	-3.2	1.12	0.4
1955	14.42	3.6	-11.53	-2.9	2.90	0.7
1960	19.65	3.9	-14.76	-2.9	4.89	1.0
1965	26.46	3.8	-21.51	-3.1	4.95	0.7
1970	42.47	4.3	-39.87	-4.0	2.60	0.3
1971	43.32	4.0	-45.58	-4.2	-2.26	-0.2
1972	49.38	4.2	-55.80	-4.7	-6.41	-0.5
1973	71.41	5.4	-70.50	-5.3	0.91	0.1
1974	98.31	6.9	-103.65	-7.2	-5.34	-0.4
1975	107.09	6.9	-98.04	-6.3	9.05	0.6
1976	114.75	6.7	-124.05	-7.2	-9.31	-0.5
1977	120.82	6.3	-151.69	-7.9	-30.87	-1.6
1978	142.05	6.6	-175.81	-8.1	-33.76	-1.6
1979	184.47	7.6	-211.82	-8.8	-27.35	-1.1
1980	220.10	8.4	244.20	-9.3	-24.1	-0.9

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

impact of this change has been accentuated by a tendency of imports to rise faster than exports, resulting in a large merchandise trade deficit in recent years.

The rest of this chapter discusses the changing structure of the economy in terms of a few key elements: the maturation of basic industries; increased international competition; the expansion of the labor force in the 1970s; the effects of the oil crises; a slowdown in productivity and capital formation; heightened cyclical fluctuations; and geographic changes in production and employment.

THE MATURATION OF BASIC INDUSTRIES

As industries mature, they tend to grow more slowly and in some cases their output even declines. When the history of goods-producing industries is examined, a common pattern is often observed. In the first phases of the development of a product, growth may be slow because the product is expensive and not yet integrated into consumption habits. But as its technology advances, it can experience rapid and self-reinforcing growth: production becomes standardized, resource bottlenecks are overcome, and economies of scale are realized. This pattern can be observed in most industries, from the move to mass production at Ford in 1913 to the development of the 64K RAM semiconductor circuit of today. Eventually the opportunities for incremental technical innovation may become exhausted, demand may be saturated, and the product may decline in its importance to the economy. Maturation can take the form of a stabilization of the product's share of output or a decline relative to the production of other goods. Some goods--such as the vacuum tube radio--undergo absolute declines as they are displaced by new production methods or products. ^{1/}

The maturation of older industries may be offset by the rise of new industries with a large potential for productivity growth. Since productivity growth has slowed in recent years, it would be easy to assume that many U.S. industries have reached their mature phase, and that there is a lack of new high-growth industries. The decline of industries is not inexorable, however. New technological innovations can lead an industry into a new

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1. This pattern of development is sometimes termed the "product life-cycle," and is described in greater detail in Raymond Vernon, "International Investment and International Trade in the Product Cycle," Quarterly Journal of Economics, vol. 80 (May 1966), and William Abernathy, The Productivity Dilemma: Roadblock to Innovation in the Automobile Industry (Johns Hopkins University Press, 1972).

cycle of growth. Some writers have speculated that robotics may revive many consumer durables industries by improving efficiency. 2/

The life-cycle view of industrial evolution suggests that a healthy economy is one in which new industries and technologies continually supplant older and stagnating ones. Data on the changing composition of output support the idea that the economy's present problems are related to a decline in the rate at which new industries are replacing older ones. An index of the rate at which the sectors are changing--that is, a measure of economic dispersion--can be constructed by summing the changes (without regard to whether the changes are pluses or minuses) in the percentage share of the output (measured by value added) of each sector. This measure of dispersion is presented in Table 5. 3/

The data indicate that the rate of dispersion in the highly aggregated sectoral level of the economy (that of the one-digit standard industrial classification) fell steadily after 1951, and that the decline accelerated in the 1970s when it dropped from 1.17 to 0.50. While the steadiness of the decline may be something of a statistical accident, the decline itself is undeniable. To generalize, the data indicate that the United States is not currently undergoing rapid sectoral change and that a mature service economy may already be at hand. This should not be read to imply that industrial change did not occur during the 1970s. Slowing the rate of change in output shares (as measured by Table 5) had perceptible effects on overall economic growth and did not negate many of the employment dislocations that occurred during the same period.

This highly aggregated evidence masks what is happening to specific industries. Table 6 shows the composition of manufacturing output at the two-digit Standard Industrial Classification level, that is, the rate of dispersion within manufacturing. In the durable goods sector one notes in particular the downward trend in primary metals (such as iron and steel foundries, and other smelting and refinery operations). This is the epitome of a mature industry in the United States; most of the innovation in the postwar period has been undertaken in foreign countries, where governments

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2. See William J. Abernathy, Kim B. Clark, and Alan Kantrow, Industrial Renaissance: Producing a Competitive Future for America (1983) for a general discussion of "de-maturity" and a detailed look at the possibilities for the auto industry.
 3. Measures of dispersion such as this are affected by the level of aggregation. Many of the changes within aggregated categories will offset each other, reducing the net measured change.

TABLE 5. SECTORAL DISPERSION OF GROSS NATIONAL PRODUCT, 1951-1977

	1951-1955	1955-1959	1959-1964	1964-1971	1971-1977
Annualized Dispersion Rate <u>a/</u>	1.52	1.45	1.22	1.17	0.50

Source: Table 2.

- a. The measure sums the absolute values of the changes in the percentage shares of output of all sectors, and converts the sum into an annual average. The formula for the measure is:

$$\sum_i \left| \frac{S_t^i}{GNP_t} - \frac{S_{t-n}^i}{GNP_{t-n}} \right|$$

n

where S_t^i = the production of sector i in year t

GNP_t = the gross national product in year t

n = the number of years in the period

The measure is equivalent to summing the absolute values of the rates of growth of the shares of output of all sectors, with each sector weighted by its share of output.