I wish you wouldn't squeeze so," said the Dormouse, who was sitting next to her. "I can hardly breathe."
"I can't help it," said Alice very meekly, "I'm growing."
"You've no right to grow here," said the Dormouse.
"Don't talk nonsense," said Alice more boldly, "you know you're growing too."
"Yes, but I grow at a reasonable pace," said the Dormouse, "not in that ridiculous fashion."

—Alice's Adventures in Wonderland

Alice and the Dormouse in Lewis Carroll's classic story offer a lesson about human nature that can be applied to our economy.

Change often produces uncertainty and anxiety. When the economic environment changes, our anxieties are frequently reflected in political and legislative action.

So it is with the emerging service economy. Over a long period of time, the U.S. economy has become increasingly oriented towards the production and employment of services, while moving away from more traditional goods-producing industries. As the transition continues, legislative policies designed to protect goods producers have become more popular.

This Economic Commentary examines the expanding service economy and suggests that its emergence is not something to be feared. Rather, service sector growth reflects a natural—and inevitable—response to rising wealth.

I Wish You Wouldn't Squeeze So
Since 1945, our economy has undergone some dramatic changes; total employment has nearly doubled and real output has increased almost threefold. While there have been increases in both output and employment in all three major sectors of the economy (manufacturing, nonmanufacturing goods, and services), the largest gains occurred in the service sector (charts 1-2).

In 1950, total employment in the U.S. was 48.5 million workers. By 1984, it had almost doubled to 91.1 million. Virtually all of the increase (90 percent) was in the service-producing industries. The majority of the remaining employment gains occurred in manufacturing, with only slight gains in nonmanufactured goods employment (agriculture, mining, and construction).
Changes in the types of goods the economy produces have also increased the demand for intermediates and services. Increased incomes and expanding markets have resulted in more product differentiation that, in turn, has increased the importance of services in the design, production, advertising, and distribution of these goods. Because of the gains from specialization and economies of scale in the provision of these services, proportionately more of these services are being provided by specialized service firms in the service sector rather than being provided in-house by firms in the goods-producing sector.

While increases in the demand and output for intermediate services have contributed to the increased service-sector activity, relative price adjustments in the distribution of value added to the overall growth of the service sector are not available. Based on an analysis of the shares of the value added to the output of the U.S. for 1947-1977, however, we estimate that only about 15 to 25 percent of the overall growth of the service sector during this period can be attributed to an increase in intermediate services. While this represents a significant increase, other factors, namely changes in the production function, enhance the explanations for the growth of the service sector.

When the market for specialized business services was small, these services were provided in-house or outsourced. Over time, they were not produced at all. Growth of the U.S. economy expanded the business and professional services market and encouraged the development of firms specializing in these services. For example, at one time the major share of accounting services was provided by a few large accounting firms. However, as the market for these services grew, specialized accounting firms were formed on a large scale. Similarly, when the market for pharmaceuticals was small, these were produced in-house in the manufacturing sector. Over time, several large pharmaceutical firms were formed that specialized in producing these goods. As incomes increase, we consume more of all goods and services. This increase in consumption is more pronounced for higher-order goods, which consumers tend to purchase in larger quantities as their incomes increase. More generally, the consumption of goods and services increases in response to a productivity improvement, but there is also a shift in this consumption toward higher-order goods and services. The distribution of necessities and luxuries is probably not even between goods-producing and service-producing industries. For example, the goods produced in agriculture, construction, and mining can probably be considered as the necessities of the population. While these industries do not produce luxuries, an income effect and a substitution effect tends to occur in these industries. In much the same way, the relative growth of nonmanufacturing industries has occurred in service industries (drugstores) to being primarily conducted in the manufacturing sector. Similarly, the growth of the economy was able to produce 2.3 percent of the overall growth of the service sector during this period can be attributed to an increase in intermediate services.

While this represents a significant increase, other factors, namely changes in the production function, enhance the explanations for the growth of the service sector. When the market for specialized business services was small, these services were provided in-house or outsourced. Over time, they were not produced at all. Growth of the U.S. economy expanded the business and professional services market and encouraged the development of firms specializing in these services. For example, at one time the major share of accounting services was provided by a few large accounting firms. However, as the market for these services grew, specialized accounting firms were formed on a large scale. Similarly, when the market for pharmaceuticals was small, these were produced in-house in the manufacturing sector. Over time, several large pharmaceutical firms were formed that specialized in producing these goods. As incomes increase, we consume more of all goods and services. This increase in consumption is more pronounced for higher-order goods, which consumers tend to purchase in larger quantities as their incomes increase. More generally, the consumption of goods and services increases in response to a productivity improvement, but there is also a shift in this consumption toward higher-order goods and services. The distribution of necessities and luxuries is probably not even between goods-producing and service-producing industries. For example, the goods produced in agriculture, construction, and mining can probably be considered as the necessities of the population. While these industries do not produce luxuries, an income effect and a substitution effect tends to occur in these industries. In much the same way, the relative growth of nonmanufacturing industries has occurred in service industries (drugstores) to being primarily conducted in the manufacturing sector.
Changes in the types of goods the economy produces have also increased the demand for intermediate services, which are services used for the production of other goods. As incomes increase, we consume more goods and services. This is a substitution effect, as consumers shift away from intermediate goods to higher-order goods. However, productivity gains were more prominent in the farm sector, rising at an annual average rate of 2.3 percent over the same 38-year period. Nonfarm productivity rose at a lesser 0.4 percent per year. As a result, the substitution effect probably encouraged the growth of farming relative to nonfarm businesses.

Overall, the income and substitution effects are complementary, since they both encourage the relative growth of nonfarm industries. However, productivity gains were most prominent in the farm sector, rising at an annual average rate of 4.6 percent over the same 38-year period. Hence, we can expect the substitution effect to be relatively large. Moreover, the income effect probably encouraged the growth of farming relative to nonfarm businesses.

The evidence from farm output is consistent with the story outlined above. Generally, since 1947, real U.S. farm output has risen, in an absolute sense, at an annual rate of 0.4 percent per year. But real output by nonfarm businesses, on average, at a 3.4 percent annual pace. As a result, the share of farming to total U.S. business output was reduced by more than 50 percent over the past 70 years. Given productivity gains in nonfarm industries, this overall increase in farm output was relatively small. But real output by nonfarm businesses, on average, at a 3.4 percent annual pace. As a result, the share of farming to total U.S. business output was reduced by more than 50 percent over the past 70 years. This overall increase in farm output was relatively small. But the income effect probably encouraged the growth of farming relative to nonfarm businesses.

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However, the distribution of national output remained relatively constant between 1950 and 1960. Only after 1960 did service-sector production significantly increase its share (chart 3). Further, the post-1960 service sector emergence has come primarily at the expense of the nonmanufactured goods sector, as the share of national output represented by manufacturing remained largely unaffected.

The reason for the behavior of these share shifts, it would seem, has to do with the offsetting substitution effects. Between 1950 and 1960, the nonmanufactured goods industry enjoyed a very large relative increase in productivity, about 5.0 percent per year, on average (chart 5). This was almost twice the average business productivity gain of 2.7 percent. A strong substitution effect in this decade may have allowed the nonmanufacturing sector to completely offset the depressing influence of the income effects over the decade.

After 1960, however, productivity growth for nonmanufactured goods industries began to slow. The offsetting influence of the substitution effect was considerably less during the 1960-1985 period than in the 1950's. Consequently, the relative importance of nonmanufactured goods industries plummeted over the past 25-year period, from 19.6 percent of total real GNP in 1960 to only 10.7 percent in 1984.

The experience of the manufacturing economy has been somewhat different, probably because the growth in manufacturing productivity, and hence the substitution effects, have helped this sector maintain its share of national output. Between 1960 and 1985, productivity in manufacturing industries rose at an average annual rate of 2.7 percent, compared to only 2.0 percent for nonmanufactured goods industries and only 1.7 percent for service industries.

Where resources are directed, depends upon where the growth in output is occurring relative to the productivity of resources in those industries. For example, because output in manufacturing has tended to maintain a stable share of national output in the postwar period, but productivity in manufacturing has exceeded that of the average U.S. industry, we would expect that manufacturing industries would employ a decreasing share of the workforce. This has indeed been the experience of manufacturing workers, who have represented a smaller proportion of total employment virtually throughout the past 35-year period (chart 4).

The nonmanufactured goods industry has also assumed a less important role as an employer, as relatively falling output and about-average productivity growth indicate relatively fewer workers are necessary in these industries. Finally, the service sector has become a more important source of employment, as the relatively high rate of this industry's output growth and relatively low rates of productivity growth require these industries to absorb an increasing share of the national work force.

The issue of the relocation of employment and other productive resources is complicated by demographic changes occurring in the labor force since 1950. Namely, the emergence of women and secondary family workers in the labor market has probably contributed to the relative growth of the service economy in terms of output and employment. If the growth in the labor force has occurred primarily among laborers with a comparative advantage in the production of service output, this would have a depressing influence on service industry wages and prices, and would further encourage the growth of the service economy.

Don't Talk Nonsense
Critics voicing popular fears claim that the emerging service economy cannot support itself, that relative declines in goods output is a consequence of foreign competition, that the growth in the service economy implies a slowdown in the growth of national wealth, and that redistributions of wealth may eliminate America's middle class.

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6. Disproportionately large increases of service workers into the labor market may also account for some of the relatively slow rates of productivity increase in these industries.
Whether or not the service sector can support itself, however, hardly seems a relevant concern given that output in virtually all goods-producing industries continues to increase. Even the real output of nonmanufactured goods industries is declining only in a relative sense, that is, as a share of total national output. To be sure, the economy is producing more goods today than ever. For example, goods production in 1980 (as a percent of GDP) was greater than in 1947 only because of productivity increases in goods industries, this output has been generated using only relatively more services. If this were true, we would expect that our real productivity slowdown and, to the extent that intersectoral shifts have contributed very little to the overall productivity growth in recent years, reaching essentially the same conclusions: productivity growth has been uniformly lower in all industries in recent years, the contribution of the intersectoral reallocation of resources to the slowdown in productivity growth in recent years, we may wish to emphasize the importance of U.S. goods producers at an increasing rate between 1967:1980. Only after 1980, did dramatic increases in the value of the dollar result in a decline in net petroleum imports, and a nonpetroleum goods trade deficit since 1983. However, even the rather dramatic turnaround in real net petroleum imports in recent years has not been associated with a decline in the share of U.S. goods production which remain fairly constant during the 1980s (chart 3). Moreover, real net service exports have been increasing since 1970, yet the magnitude of real service trade gains has been negligible relative to the general growth of the U.S. service industry.

Overall, while international trade flows may have been important factors in the relative decline of some goods industries during the postwar period, the relative decline of the aggregate goods-producing sector appears largely unrelated to international trade considerations.

And what about the fears that we will reduce the growth of national wealth? As discussed earlier, the aggregate growth of productivity in the service economy has been less than that of the goods-producing economy throughout the postwar period. Some believe that shifting of resources into an industry with a relatively slow productivity growth is responsible for the nation's lower rate of productivity growth in recent years and, therefore, is responsible for slowing the growth of the economy.

A number of studies, however, have examined the extent to which growing service industry employment has contributed to the slowdown in productivity growth in recent years, reaching essentially the same conclusions: productivity growth has been uniformly lower in all industries in recent years, the contribution of the intersectoral reallocation of resources to the slowdown in productivity growth in recent years, we may wish to emphasize the importance of U.S. goods producers at an increasing rate between 1967:1980. Only after 1980, did dramatic increases in the value of the dollar result in a decline in net petroleum imports, and a nonpetroleum goods trade deficit since 1983. However, even the rather dramatic turnaround in real net petroleum imports in recent years has not been associated with a decline in the share of U.S. goods production which remain fairly constant during the 1980s (chart 3). Moreover, real net service exports have been increasing since 1970, yet the magnitude of real service trade gains has been negligible relative to the general growth of the U.S. service industry.

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It is often assumed that since some high paid manufacturing workers are forced to accept paying service sector positions, there has been a general lowering of the standard of living for Americans. To be sure, the standard of living for some displaced manufacturing workers is reduced. But the average standard of living in the U.S. must be greater, since it is an increase in aggregate wealth that has primarily brought about the growth of the service economy. The problems of displaced workers are important ones that public policy may wish to address. But policies aimed at discouraging the service transition by "protecting" goods-producing employment threaten to reduce the standard of living for the entire economy. If we choose to address the potential inequities associated with economic transitions, policies designed to spread the burden of the transition, such as job retraining or other wealth redistribution schemes, should not be less costly, and certainly more effective. Finally, some believe that the "once-solid middle tier of American jobs has been undermined" by the shift of employment into the service sector which has a smaller portion of middle tier jobs. While the evidence here is not conclusive, Robert Lawrence of the Brookings Institution has shown that while the "middle class" has shrunk from 50 percent of all workers in 1960 to 46 percent in 1963, very little of this decline can be attributed to the shifting of employment into the service sector. In fact, he found that the greatest reduction in middle-income jobs was in the goods-producing, not service-producing sectors. He suggests more likely explanations for the shrinking middle class, namely, an increase in the number of part-time workers, and changes in the age and skill composition of the work force.

Curiouser and Curiouser

The uncertainties associated with an economy in transition create a great deal of anxiety, such as those which accompanied the Industrial Revolution. In the mid-18th century, for example, just prior to the industrial revolution, a French school of thought called Physiocracy held that all wealth arose from agriculture. Only the earth, they said, yields more than is put into it, from "the sterile" soil surpass the "productive" one of industrialists and others are supported. The problems of the industrial revolution, they believed, were that a growing industrial economy could not support itself, that the movement of resources into the industrial sector would cause starvation, and that the redistribution of wealth from farmers to industrialists was in some sense "unfair." Similar sentiments in the U.S. gave rise to a complex series of legislation designed to protect the interests of farmers. Physiocracy, however, had a rather meteoric life, fading in part due to the popularization of the teachings of Adam Smith.

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Economic fallacies rarely die, however, they just lay dormant for a time. Echoes of the Physiocratic theory can still be heard in 1986. It would be unfortunate if the transition toward a relatively greater reliance on service production brought with it its own forms of protective legislation, such as industrial policies and protective trade laws. A careful examination of the reasons for the relative growth of the service economy will help the policy makers design to prevent its emergence seem ill-advised—or, as Alice might say, "curiouser and curiouser."

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7. Real petroleum trade data are not readily available prior to 1967. However, given the size of petroleum imports relative to total goods imports prior to 1967, it is unlikely that earlier data would substantially alter this analysis.
8. For example, see Dennis (1979), Kutscher and Mark (1983), and Fuchs (1976).
10. The fears such beliefs amuse have, at times, provided very misguided (but predictable) policy prescriptions. See for example "Deindustrialization and the Two Tier Society." Cited by R. Kirkland, Jr. in "AFL-CIO Comments to the U.S. Senate on the Proposed Trade Act," Washington, D.C.: AFL-CIO, June 26, 1979.

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virtually all of the increase has been related to rising petroleum imports (chart 6). Net U.S. exports of real non-petroleum goods actually favored U.S. goods producers at an increasing rate between 1967:1 and 1980:4. Only after 1980, did dramatic increases in the value of the dollar result in a decline in net non-petroleum goods export, and a non-petroleum goods trade deficit since 1983. However, even the rather dramatic turnaround in real net U.S. non-petroleum goods exports in recent years has not been associated with a decline in the share of U.S. goods production which remain fairly constant during the 1980s (chart 3). Moreover, real net service exports have been increasing since 1970, yet the magnitude of real service trade gains have been negligible relative to the general growth of the U.S. service industry.

Overall, while international trade flows may have been important factors in the relative decline of some goods industries during the postwar period, the relative decline of the aggregate goods-producing sector appears largely unrelated to international trade considerations. And what about the fears that we will reduce the growth of national wealth? As discussed earlier, a slowing rate of productivity in the service economy has been less than that of the goods-producing sectors. Some people believe that the movement of resources into the service sector is economic fallacies rarely die, however, even the fears of industrial decline can still be heard in 1986. It would be unfortunate if the transition toward a relatively greater reliance on service production brought with it its own forms of protective legislation, such as industrial policies and protectionist trade laws. A careful examination of the reasons for the relative growth of the service economy make the policies designed to prevent its emergence seem ill-advised—or, as Alice would say, "curiouser and curiouser."