industrial structures.[3]

Good Times and Bad

Contributions to regional industrial growth are not constant over time. Changing economic conditions (recession, inflation, exogenous shocks) are likely to affect industry growth within the national and regional economies and thus alter structural and competitive contributions. Consider two subperiods of similar length but dissimilar economic conditions—1961–70 and 1970–82—again measuring from trough to trough on the business cycle. The first subperiod was characterized by relatively low and stable inflation and only minor recessions. The second subperiod was a time of high and accelerating inflation, very severe recessions, and energy price shocks. For the period 1961–70, there is a clear and perhaps surprising story to tell (see chart 2). The more stable economic conditions of the 1960s were accompanied by a strong tendency among employment-growth rates in all of Ohio's industries and industry aggregates to approach the national standard. Although the structural shift toward nonmanufacturing and the competitive lag of most of Ohio's industries still were apparent, the differentials were much less pronounced.

Ohio's manufacturing industries performed very poorly in the second subperiod—1970–82—which encompassed the most unstable and uncertain economic conditions since the end of World War II (see chart 3). Most manufacturing industries experienced large declines (negative growth) in employment, as structural and competitive differentials widened. Only chemicals and petroleum escaped this cluster, again because of a moderate competitive advantage over the national industry.

Business-cycle dynamics are part of the totally different experience of Ohio's industries in the 1960s and the 1970s. The demand for manufactured goods is highly sensitive to overall economic growth. Recessions are concentrated in manufacturing industries and regions with the most marginal facilities. If recessionary pressures are minimized, structural and competitive growth differentials dissipate. Moreover, long periods of relatively stable prices and high capacity utilization, as in the 1960s, may lengthen planning horizons and reduce growth limitations commonly associated with short-term profit maximization. This also may be especially significant in manufacturing, where long lead times in product and process development are important, and payback periods on investment may be lengthy as well. A stronger manufacturing climate improves competitive prospects in nonmanufacturing industries, presumably because of linkages between manufacturing and nonmanufacturing activities. Admittedly, the elements in this transmission from national to regional economies are far from clear. Nevertheless, there is a strong presumption that general economic conditions (inflation and unemployment) are transmitted to regions through both structural and competitive mechanisms, and that a healthy national economic environment would ease the stress on regional economies in structural and competitive transition.

Concluding Observations

Comparisons of employment growth in Ohio presented here probably pose more questions than provide answers to the regional industrial growth puzzle. No attempt was made to explain specific industrial situations, and general explanations were more hypothesis than test of hypothesis. Still, four conclusions, or observations that might guide further research, seem warranted.

- Slow economic growth over the long term in Ohio is associated with structural and competitive elements. In terms of the multiproduct firm analogy, we are unfavorably represented in slow-growth markets and are losing market share.
- Neither structural nor competitive differentials are constant over time. A healthy national economic climate significantly reduces regional problems of both types. While the transmission mechanism here is far from clear, it may be that industry-specific and region-specific factors account for a smaller proportion of growth differentials than we might think.
- On balance, competitive effects outweigh structural effects because of their pervasiveness. We especially need to determine why the industries where Ohio has long held scale, agglomeration, transportation, and other advantages are underperforming their national counterparts, even under the most stable economic conditions. Resource costs and productivity are possible explanations, but more evidence needs to be examined.
- Nonmanufacturing jobs are not replacing manufacturing jobs. Nonmanufacturing jobs in Ohio are expanding faster than manufacturing jobs in the state, but not as fast as nonmanufacturing jobs nationally. This suggests linkages between industries that "tie" the nonmanufacturing sector to the manufacturing base. If so, the nature of these ties needs to be examined more fully.

3. Some linkage probably exists between manufacturing and many nonmanufacturing industries. The production of goods has become increasingly complex. Firms have become larger, with greater diversity of product lines. Firms also have become more highly regulated. These factors have promoted employment growth in accounting, finance, law, public relations, and other areas in the nonmanufacturing sector. More generally, the output of nonmanufacturing industries often is not traded in national markets. Although this is not uniformly true (finance, for example, tends to be national in scope), major segments of nonmanufacturing may be locally dependent, relying on manufacturing for growth prospects.

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Sources of Regional Growth Disparity: The Case of Ohio's Industries[1]

by Roger H. Hinderliter

A serious problem in the U.S. economy is slow growth or outright decline in employment in many manufacturing industries. This problem is not dispersed uniformly among regional or state economies in the United States. It is most acute in those states, including Ohio, that have been leading centers of industrial production for many years. In these states manufacturing jobs have declined sharply. Ohio, for example, lost over 300,000 manufacturing jobs between 1970 and 1982, more than 20 percent of its manufacturing work force in 1970.

There are several possible explanations for slow employment growth being concentrated in states such as Ohio. Business cycles provide one explanation. Recessions typically are centered in manufacturing, and the two most severe recessions in the post-World War II period occurred in the past 12 years. Recoveries also develop slowly where, as in Ohio, manufacturing activity is concentrated in capital-goods production.

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The views stated herein are those of the author and not necessarily those of the Federal Reserve Bank of Cleveland or of the Board of Governors of the Federal Reserve System.

1. This article is a revised, shortened version of a paper presented at a recent conference, "Regional Growth and Industrial Change," Federal Reserve Bank of Cleveland, November 18, 1983. The complete paper is available from the author.

Another explanation rests on long-term structural and competitive changes in economic activity. As national output evolves structurally and becomes more heavily weighted toward services or other nonmanufacturing activities, manufacturing industries and manufacturing regions naturally grow more slowly. Increasingly, it appears that much of the problem is associated with a loss of competitiveness. While competitive advantages or disadvantages often are illustrated in terms of international comparisons (such as the United States vs. Japan), they are no less important among regions within the national economy. In the simplest sense, Ohio no longer attracts new firms or expansions of existing firms at the same rate as other states in the United States.

A Regional Industrial Framework

The major source of regional growth is the national economy, and the rate of employment growth in the national economy is a useful standard against which regions and regional industries can be evaluated. Any region is part of a larger system, the national economy. A region shares a common currency and legal system, as well as financial, educational, and other institutions with other regions in the national economy. Because the absence of tariff barriers and migration restrictions permits a free interregional flow of products

and resources, a region is influenced by national trends in labor markets, investment patterns, and technological advances. A region also participates with others in evolutionary changes in economic activity. If, for example, as per-capita income rises, economic activity evolves through primary, secondary, and tertiary stages—from agriculture to manufacturing to services—all regions would reflect this pattern.

Despite the common factors, no region is simply a miniature version of the national economy. Natural resources differ across regions, as do the size and composition of the industrial base inherited from the past. These features impart a *lumpiness*, or inertia, to regional economies that can be prolonged over a long period of time. As a result, evolutionary changes in economic activity need not be transmitted to regions equally or proportionately to existing size.

Neither are national market trends reproduced precisely at the regional level; rather, sharing national trends is accomplished by smoothing regional differences through market linkages among regions. For example, if labor-force growth in region A exceeds that of region B, adjustments in relative labor costs can be expected to create incentives for labor to migrate to B, equalizing (or tending to equalize) labor costs and underlying labor-force growth rates. Both A and B converge toward the national average. The tendency for regional differences to converge is a natural presumption, but convergence may be slow and some differences could be cumulative. Thus, while migration flows are encouraged by labor-cost differentials, there also are costs, pecuniary and nonpecuniary (social reluctance, for example), that discourage moving. Income transfers (unemployment compensation and welfare) may reinforce a reluctance to move. Even if workers are willing to migrate, other arrangements (for example, differences in unionization of the work forces) may make it difficult to exploit and equalize labor-cost differentials. These kinds of rigidities also may be prolonged; hence, market differentials among regions can remain over long periods, supporting unequal rates of employment growth.

This discussion suggests two channels of regional growth disparity—a region's industrial structure and a region's competitive position vis-à-vis the national economy. A region may grow relatively fast (or slowly) because it holds a relatively large concentration of industries that are growing rapidly (or slowly) throughout the nation. Thus, the region has a favorable (or unfavorable) *industrial structure*. A region also may grow relatively fast (or slowly) because its own industries outperform (or underperform) their counterparts in the national economy. Thus, the region has a favorable (or unfavorable) *competitive position*. Perhaps this can be clarified by an analogy with a multiproduct firm. That firm would grow rapidly or slowly, relative to some standard or average rate of growth, depending on the composition of its product lines in fast- or slow-growing end markets (the structural component), and whether it is increasing or decreasing market share in each of its product lines (the competitive component).

Employment Growth in Ohio

Employment growth in selected Ohio industries for the period 1949–82 (measured from trough to trough on the business cycle) is shown in chart 1.[2] The axes are labeled in terms of the structural and competitive contributions to industry growth rates in Ohio. Diagonal lines represent *equal growth curves*, which are alternative structural and competitive contributions that yield the same industry-growth rate. Three of these curves are labeled in reference to the national growth rate. The top right quadrant in the chart represents the "best of worlds," where both structural and competitive components are sources of industry growth above the national average. The bottom left quadrant is the "worst of worlds," where both the structural and competitive components depress industry growth.

An examination of Ohio's industry-growth rates suggests two general characteristics of the state's industrial sector in the postwar period. First, a large concentration of zero-growth or near-zero-growth industries exists in the state, including total manufacturing and its durable goods and nondurable goods divisions and all selected manufacturing industries except transportation equipment and chemicals and petroleum. Second, the structural contribution to growth is generally positive for nonmanufacturing industries and negative for manufacturing industries, but the competitive contribution is nearly always negative. The exceptions again are transportation equipment and chemicals and petroleum. Indeed, these two industries escape the zero-growth cluster because the competitive contribution, although moderate, is positive.

The positive structural contribution is especially strong in services and finance, two industries that have become prototypical examples of rapid-growth possibilities. In Ohio, however, the services and finance industries expanded employment less rapidly than their national counterparts. Nonmanufacturing jobs are not replacing manufacturing jobs. Though benefiting from strong growth from the national economy, Ohio's nonmanufacturing industries lag the national industries as much as many manufacturing industries.

The pervasiveness of underperformance by Ohio's industries is disturbing and, on balance, outweighs the cumulative effects of an unfavorable industrial structure. Between 1949 and 1982, total employment in Ohio increased at 1.7 percent a year, on average, a shortfall of 1.5 percentage points from the national average of 3.2 percent. Nearly 0.4 percentage point of the shortfall is associated with Ohio's industrial structure. The shortfall resulting from the underperformance of Ohio's industries is about 1.1 percentage points. This strongly suggests industry supply and demand factors, including the cost and productivity of resources, transportation, and inter-industry linkages, have more to do with the observed employment growth patterns than do evolutionary changes in economic activity and rigidities of regional

2. The expression graphed in chart 1 is

$$(g_i/g) - 1 = (g_I - g/g) + (g_i - g_I)/g,$$

where

g_i = employment growth in industry i in Ohio,
g = employment growth in the national economy,
g_I = employment growth in industry i in the nation.

The mechanics behind this expression are more fully developed in the longer paper mentioned in ftn 1.