

Chicago Fed Letter

The return of Central Europe

The nations of Central Europe—does anybody remember exactly when in the last astonishing 12 months we stopped calling it Eastern Europe?—are bent on returning to the economic fold of the West. With no precedent on which to rely, economists have been working overtime to assess the long-term promise, and the short- and mid-term problems and costs of this transition.

Unfortunately, most of the available income-related statistics are dubious. Furthermore, national income statistics for these countries are not comparable in their form to those of the West. The communist bloc countries' national income accounts have excluded services not directly related to the delivery of physical product. Thus, estimates of most types of services provided in an economy—personal, educational, medical, financial, and even defense—must be made before a Western-style GNP or GDP for a Central European economy can be developed. Consequently, any “comparable” national income statistics from these countries rely on very rough estimates.¹ In short, it is probably pointless to compare an estimate of the gross national product of a secretive, centrally planned, soft-currency country to its open, free-market, hard-currency counterpart.

The infrastructure of Central Europe

There are economic measures pertaining to the Central European nations that appear to be more relevant to their economic state than

estimates of their GNP/GDP. These numbers describe aspects of the human and physical infrastructure. The picture they give is not as bleak as the pessimistic economic analysts suggest. But, they indicate that bringing Central Europe up to speed will require very large capital investment, much of which is likely to come from external, that is, Western, sources. This *Chicago Fed Letter* looks at some of these numbers.²

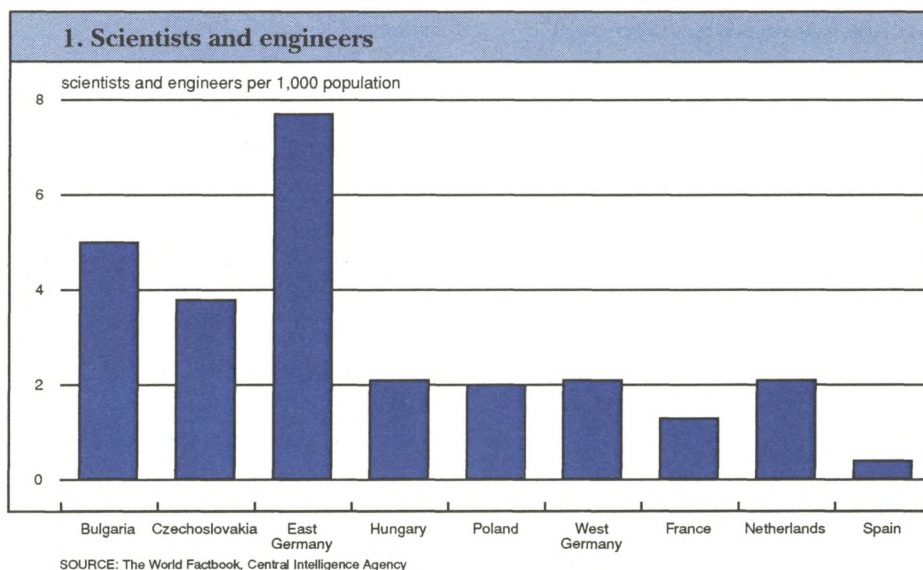
Central Europe—Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, and Romania—comprises an area nearly equivalent to Texas, Oklahoma, and Louisiana, or a little less than 45% of the area of the 12-

tially higher proportion than in the EC where the labor force accounts for 43% of the population.

Education

The basic education level of the population in Central Europe is comparatively high. Its literacy rate averages 98%. This is slightly higher than the average reported for the EC. (Literacy rates in most EC states are reported at 98% or higher, but are in the low to mid-90s in Portugal, Greece, Spain, and Italy.³)

The number of scientists per thousand population supports the idea that the educational infrastructure in



state European Community (EC). Central Europe's population is estimated at just over 113 million, about the same as that of France and the United Kingdom. The labor force of the six countries is estimated at about 49% of the population, a substan-

Central Europe is comparatively strong (see Figure 1). The number of scientists and engineers (S&E) per 1,000 population, excluding Romania, was 3.6 and for technicians was 2.0 in the early 1980s. This compares favorably with the EC where

(S&E)/1,000, excluding Luxembourg, stood at 1.3 and technicians at 1.3.⁴

While the composition of these data may suffer from cross-country incompatibility, nonetheless, they do suggest that a highly educated work force is available. It is likely that scientific and technical workers who previously responded to the dictates of central planning authorities might find it difficult to shift to the different sets of priorities underlying a market-oriented economy. Productivity gains are therefore likely to lag during the initial stages of the transformation from centrally planned to market-oriented economies. During the longer-term, however, the high level of educational infrastructure provides a fundamentally positive force for economic growth in Central Europe.

Rails and roads

A key measure of a country's infrastructure is the development of its transportation systems. Ideally, a measure of quantity and quality of the systems is desirable. But quality measures, in particular, are difficult to obtain and difficult to interpret when they are available. Definitions of a "hard surface" for roads range from four-lane, limited access expressways to narrow two-lane concrete or asphalt trunk highways to crushed rock or gravel rural roads. Railroad beds may range from those developed for new high-speed rail to ancient narrow-gauge rail beds. Indeed, the varying railroad gauges are a real impediment to the ability of Central Europe's transportation system to contribute to its fullest in the development process.

Apart from quality measures another question arises—how to measure the "density" of the transportation system. For example: Highway distance by population? Highway distance by land area? Or, some combination of the two? Here we use a density measure using kilometers of rail or road by population.

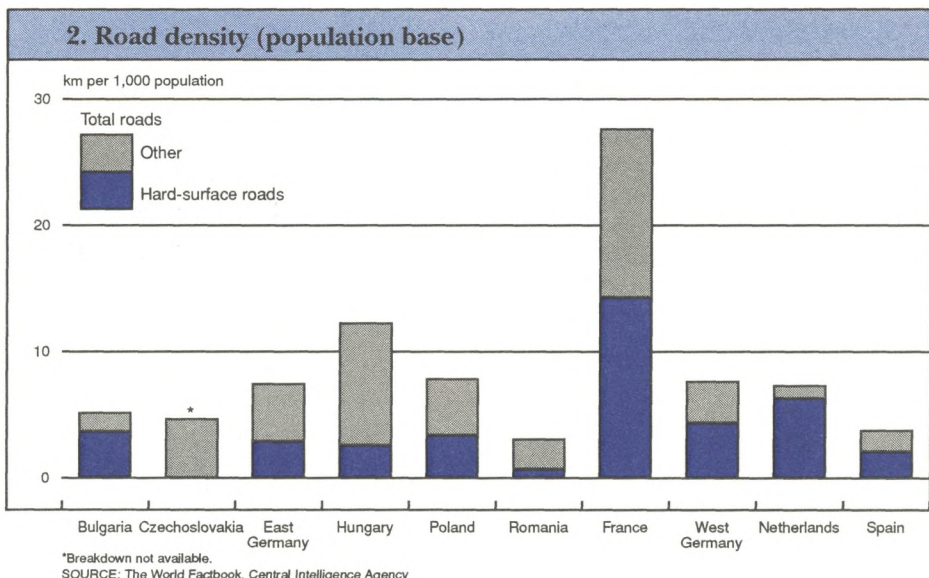
Central Europe is well endowed with railroads. The six countries, on average, contain a "rail density"⁵ of 0.7 kilometers (km) with a range from 0.5 km in Romania to 0.8 km in Czechoslovakia and East Germany. By comparison, the EC's rail density averages only 0.4 km and ranges from 0.2 km in the Netherlands to 0.7 km in Luxembourg.

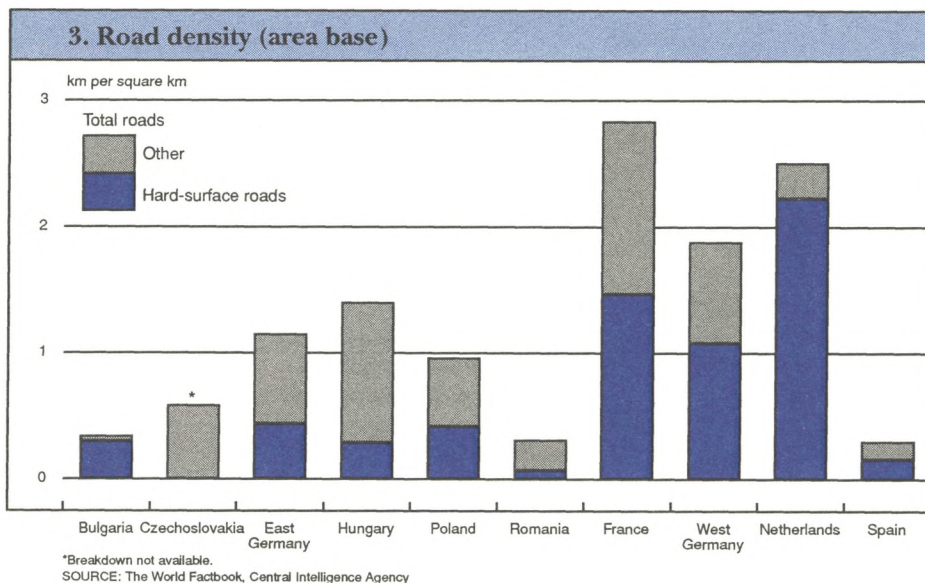
Central Europe does not fare so well with respect to its highway system, especially roads classified as hard surface, see Figure 2. (For comparison, Figure 3 presents a density measure based on road by land area.) Central Europe's average "road density" (hard surface) of 2.5 km is only 40% of the EC's average of 6.4 km. The low level of transportation infrastructure in Central Europe could be expected to be a significant impediment to growth. Research by David Aschauer, based on U.S. data, indicates that even when an extensive transportation system exists—the U.S. has a hard surface road density of more than 14 km, as measured here—investment in the highway system should still contribute significantly to economic development.⁶

To bring Central Europe's hard-surface highway system up to the EC's average road density would

require the construction of more than 440 thousand kilometers (about 274 thousand miles) of roadway. However, Central Europe might be able to make do with a lower road density. West Germany, for example, is one of the most productive countries in the EC, yet its road density (4.4 km) is nearly 2 km below the EC average. It does possess, however, a comparatively high density of four-lane, limited access highways. Presumably, a relatively high proportion of strategically placed four-lane, limited access highways should also contribute to the Central European economy. Using the West German road density as an alternative "goal" would require an additional 215 thousand kilometers (134 thousand miles) of roadway construction in Central Europe.

The capital investment necessary to bring Central Europe's hard-surface road density up to the level of West Germany would be huge. The cost per mile of highway construction in Central Europe is uncertain. But based on rule-of-thumb figures for nonurban highway construction in the United States—\$750 thousand to \$1 million per mile—the highway infrastructure bill could range as high as \$100 billion to more than \$130 billion.





Communications

Communication facilities are another form of infrastructure in which Central Europe lags well behind the EC. Telephones per capita, as of the mid-1980s, ranged from 12 to 24 phones per 100 persons. These figures compare with those of the least developed of the EC members—Portugal—and are less than 40% of the telephone density in West Germany, the Netherlands, or France. Reliable and extensive communication facilities are vital to the development of an advanced commercial system. Here again the amount of investment in lines, switching gear, and the like needed to bring up the communications system to a level comparable to Western Europe is more than trivial.

Outlook

Infrastructure development in Central Europe has a long way to go to attain the levels of Western Europe. Education and railroads look good, but highways and communications seriously lag the EC countries.

The magnitude of the investment in infrastructure that is necessary to establish a base upon which market-oriented industries can build and

become competitive is likely to be on the order of hundreds of billions of dollars. This is over and above, or, more precisely, before and underneath, the plant, equipment, and financial infrastructure investment necessary to make the market sector internationally competitive.

Such investment can not be generated, or absorbed, overnight. Yet, it is critical to the success of the development process. This investment will not occur in isolation. As noted earlier, much of the investment will of necessity come from external sources. In turn, these international financial and goods markets will face intensifying pressure on prices and output. Finally, the outcome of these changes will have a profound impact, not only on the economies of the countries directly involved, but also on the industrial economies and the third-world economies that suddenly find Central Europe to be a major competitor for development capital.

—Jack L. Hervey

¹*The Economist*, "Grossly Deceptive Product," March 10, 1990, p. 71, recently noted that estimates of per capita gross domestic product (GDP) for East Germany, for example, range from \$4,000 to \$13,000 depending on the source of the

estimate. A range of this magnitude tells us that until better numbers are available analysts would do well to examine measures other than GNP/GDP to obtain a realistic "feel" for the economic state of Central Europe.

²Any discussion of economic infrastructure relies on a key assumption about the legal infrastructure of the country, specifically a universal basis for commercial law—the sanctity of contracts, property rights, and the like. This is an infrastructure issue, one that holds considerable uncertainty, that is not addressed in this *Letter* but which cannot be ignored in considering how Western investors view Central Europe and consequently the economic outlook for the region.

³*The World Factbook*, 1989, Central Intelligence Agency, Washington, D.C.

⁴*Statistical Yearbook*, 1985/1986, United Nations, New York.

⁵This density measure (by country) is based on the kilometers of track or highway per 1,000 population.

⁶Recent work by Aschauer indicates that public investment in infrastructure, e.g., the highway system, contributes significantly to economic development. See David Aschauer, "Public Investment and Productivity Growth in the Group of Seven," *Economic Perspectives*, Federal Reserve Bank of Chicago, September/October 1989.

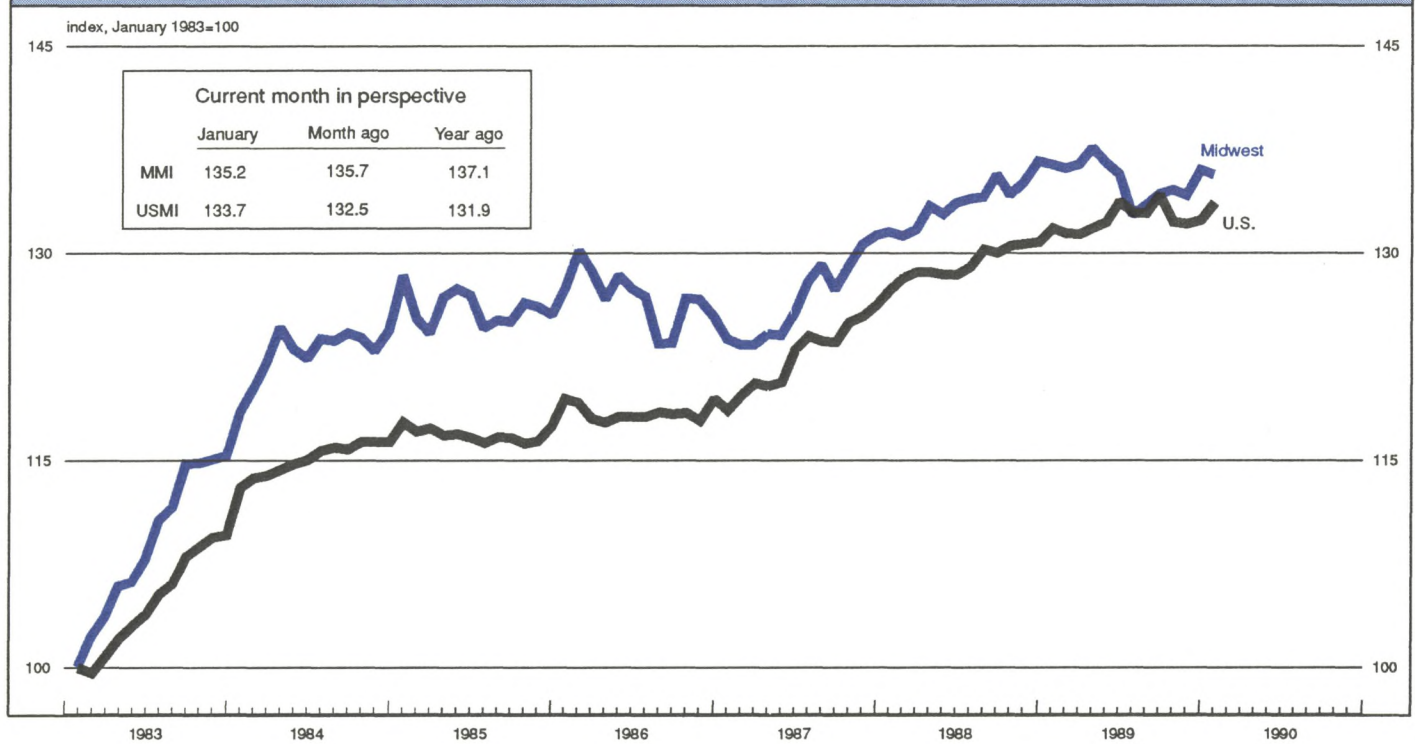
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MMI — Midwest Manufacturing Index: Current expansion



Manufacturing activity in the Midwest declined 0.4% in January, with employment dropping 1.8%. The drop in economic activity largely reflected plant shutdowns in the auto industry, where production slumped 7.5%. However, other key sectors, notably metalworking and machinery, were relatively flat. The transportation sector is expected to remain a source of softness, as auto plant closings continue into the early months of 1990.

NOTE: The MMI and the USMI are composite indexes of 17 manufacturing industries and are derived from econometric models that estimate output from monthly hours worked and kilowatt hours data. For a discussion of the methodology, see "Reconsidering the Regional Manufacturing Indexes," *Economic Perspectives*, Federal Reserve Bank of Chicago, Vol. XIII, No. 4, July/August 1989.

Manufacturing activity nationwide showed more strength than the Midwest, but followed a similar pattern. The USMI rose nearly 1% in January, despite a 3.1% decline in transportation. Both machinery and metalworking sectors were virtually unchanged.

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