Concluding Remarks

This paper is intended to be descriptive rather than analytical. For greater insight, a model of industrial price-output performance should be estimated, but the national accounts do not provide all the information needed for that purpose and are especially weak on capital. Much work has been done on an annual model with four equations for each industry: demand for labor as a function of real output and the relative price of labor, supply of labor as a function of the industry's wage rate compared to the overall wage rate, demand for real output as a function of real GNP and the relative price of output, and price as a function of the wage rate and labor productivity.

When the results of this effort are ready for presentation, they might provide insight into the principal findings of this paper—particularly the negative price-quantity correlation both within and across industries—by distinguishing between explanatory factors peculiar to each industry ("technical change") and more general macroeconomic influences.

Discussion

TWO POSSIBLE EXPLANATIONS were seen by William Nordhaus for the negative correlation between price changes and output changes by industry. One was exogenous differences in productivity growth, which shift supply curves outward by varying amounts; the other was economies of scale that could be realized because of outward shifts in demand curves. He emphasized that it was difficult to distinguish between the two, and yet important to disentangle them. For example, economies of scale could, in principle, explain the marked slowdown in labor productivity in all major industrial countries since 1973. According to that view, the slow growth of demand would have more than a purely cyclical adverse effect on productivity. He mentioned that Japanese engineers and economists point to the slow growth in their export demand as a cause of less robust investment, raising the average age of equipment and retarding the growth in productivity.

Michael Wachter felt that the negative correlation of long-run changes in prices and quantities across industries was understandable. But he was puzzled by the predominantly negative correlation year-to-year within each industry. James Duesenberry suggested that industries go through various growth phases; in a rapid growth phase, an industry would enjoy economies of scale, new technology, or the vintage effects of new capital, and it would display more rapid growth of output and lower increases of relative prices than in other phases of its development. That could produce the pattern Houthakker found in the time series within industries. Nordhaus noted that such an explanation required year-to-year differences in the growth of productivity to be more important within an industry than year-to-year variations in the growth of demand.

In response to a question, Houthakker explained that the acceleration in overall inflation and concomitant slowdown in real GNP during the 1970s could not account for his time-series results because the findings hold within subperiods and also when inflation for an industry is measured relative to the inflation rate throughout the economy. Peter Clark felt that lagged changes in prices should be included in the industry time-series equations to determine whether there is a microeconomic analog to the macro momentum effect of inflation.

John Norsworthy cautioned that the value-added data were weak. For many service industries, output measures were derived from data on labor input. In addition, the calculations of value added are based on intermediate inputs from an input-output table for 1967, and those estimates are likely to be inappropriate for recent periods in which relative prices of inputs have changed substantially. Norsworthy suggested that it might be worthwhile to split the data before and after 1973 and to omit some industries that are measured poorly.

Robert Gordon and George Perry felt that Houthakker's micro results did not contain any macro mysteries. Perry noted that the transmission of strong aggregate demand into inflation worked mainly through labor markets and that it would not be expected to create positive correlations between output and prices at a micro level.