THE WHARTON MEASURES OF CAPACITY UTILIZATION

DESCRIPTION OF SERIES

The Wharton Econometric Forecasting Associates provide quarterly measures of capacity utilization for manufacturing, mining, and utilities industries. Capacity or potential output is defined as the maximum sustainable level of output an industry can attain under normal input conditions. Actual output in the Wharton measures is defined by the quarterly averages of the monthly Federal Reserve System indexes of industrial production.

STATISTICAL PROCEDURES

Capacity utilization rates are calculated for about ninety industries at the three-digit level of disaggregation in manufacturing, mining, and utilities. For each of these industries, peak output periods are determined by inspection of the actual output graph of the Federal Reserve System production indexes. It is assumed that relative peaks in the time series—that is, where output in a period exceeds that in the predecessor and successor periods—represent the potential output the industry could produce at the time of the peak. Since the utilization rate is defined as the ratio of actual to potential output, the capacity utilization rate in these periods is 100 percent. In periods between peaks, potential output is measured along the straight line that connects the flanking peaks. Since the actual output is below the linearly generated potential output, utilization rates between peaks are less than 100 percent.

During periods prior to the first and after the last peaks, capacity output is defined as lying on the line that has the same slope as that which connected the closest two peaks; that is, capacity at the end points is extrapolated. The individual utilization rates calculated at the three-digit level are then aggregated into twenty-seven two-digit categories using the Federal Reserve production index weights. Further weighting of the two-digit utilization rates is performed to produce aggregate rates for manufacturing durables and nondurables, total manufacturing, mining, utilities, and a grand total.

RELATION TO OTHER SERIES

During the period since the mid-1960’s, the Wharton measures of utilization have grown significantly higher than those calculated by other groups. During the business cycle peak in 1973, for example, the Federal Reserve estimated that the capacity utilization rate in manufacturing was 87.6 percent, indicating a fair amount of spare capacity in the economy. The Wharton rate during this period, however was approaching 95 percent, indicating that bottlenecks in interindustry relationships had brought aggregate utilization to its business cycle peak. Also, see the related discussions on the Federal Reserve Board and Bureau of Economic Analysis capacity utilization series.

USES AND LIMITATIONS

Wharton capacity utilization rates are used as sensitive indicators of business cycle activity and as signals of inflationary pressure in the economy. Because the Wharton estimates of capacity utilization are based on an equilibrium concept, their movements toward peak levels indicate the buildup of high demand and attendant inflationary pressures. These signals first began to emerge in the mid-1960’s and occurred again in 1973 and 1979. For this reason, the Wharton measures of capacity utilization can be used as explanatory variables for investment and price determination in econometric forecasting models.

There are two difficulties with the linear peak-to-peak measurement of capacity utilization. The first is the identification of a local maximum point as a peak when, instead, it represents only a partial recovery. The so-called “weak-peak” problem was most prevalent in the 1959-60 recovery period. The second difficulty with peak-to-peak measurement occurs as the economy approaches full capacity. As output moves upward, there is a tendency to identify each succeeding period as the output maximum. Final identification of the actual peak cannot be determined until the output measure begins its downward turn. This phenomenon leads to some short run overstatement of utilization rates and subjects the measures to an upward bias and frequent revisions. Experience has shown, however, that while errors in measuring potential output may modestly impair the accuracy of the level, they do not affect the magnitude of the changes from quarter to quarter or year to year.

REFERENCES