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Improving Production Management

Manufacturers can be loosely categorized into two groups: those that produce to order and those that produce to stock (in anticipation of demand). In reality the distinction is blurry—some firms may do both. A firm that produces to order may keep an inventory of work-in-process that they complete to fill orders. Conceptually, a "just-in-time" producer neither holds inventory nor backlogs orders, but instead adjusts production "automatically" with demand.

Because the production process takes time, firms rely on forecasts of demand to determine production plans. The accuracy of those forecasts will determine how much undesirable variation there is in the production schedule, with firms adjusting production if they realize their forecasts are wrong.

The amount of unfilled orders or inventory relative to sales measures the possible mismatch between production and sales. A firm that produces to order will monitor the backlog of unfilled orders, while a firm that produces to stock will monitor the level of inventory. If unfilled orders rise above some desired level, or inventories fall below some desired level, production is sped up by increasing overtime, adding new shifts or even adding new capacity. If the reverse occurs, production is slowed down. If the miscalculation is large enough, this might even result in temporary layoffs.

As innovations in information technology become more comprehensively incorporated into the economy, one would expect that both the forecasting capabilities and the production management process will improve. Retailers will get better information about the market, and improved communication with suppliers should reduce unwanted inventory, improve delivery times and reduce backlogged orders. Even if not all firms adopt "just-in-time" production, we should observe an improvement in the management of production.

At the manufacturing stage, both unfilled orders and inventory as ratios to monthly shipments have fallen since the 1990-91 recession (see chart) and are now at historical lows. The ratio of manufacturing unfilled orders to monthly shipments has fallen from 2.31 in March 1991 to 1.61 in December 1997. The ratio of manufacturing inventory to monthly shipments fell from 1.75 in March 1991 to 1.35 by December 1997. This suggests that the production process is becoming more streamlined, and supports anecdotal evidence that firms are using information technology to improve production management. A lower level of unfilled orders indicates faster response of manufacturers who produce to order, and a lower level of inventory to sales indicates either better forecasts or improved inventory management. Errors in predicting demand are thought to be partly responsible for most post-war recessions. Improved production management will not only free up resources that would otherwise be tied up in inventory, but may even help reduce swings in the economy.

–Donald S. Allen