The Economics of Modern Manufacturing

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Manufacturing in 2002 differs significantly from one year ago, and dramatically from five years ago. The extraordinary events of the past year have created a unique manufacturing environment, replete with new challenges and uncertain pitfalls.

In November 2001, the National Bureau of Economic Research (NBER), a private, non-profit tracking group composed of academic economists from Harvard, Stanford and other universities, made official what everyone had already suspected: The country was in a recession and had been since March.
According to the International Monetary Fund, a recession occurs when economic growth, as measured by the GDP (Gross Domestic Product), falls below 2.5%. The U.S. GDP enjoyed its last significant upswing during 1Q 2000, when it peaked at 5%. Since then, it has plummeted, falling into negative numbers about one year ago. It has slowly regained ground since, but with little gusto to date. "The economy had been gangbusters for the past five to six years due to demand," says Mike Braatz, co-founder and vice president of business development, at Optiant , a supply chain software company based in Boston, MA. "Now, nothing is certain and that is a problem for manufacturers."
By the end of 2Q 2001, the big economic picture was gloomy. The GDP was growing, but at a scant 0.3%. If that weren't bad enough, the Sept. 11 attacks slowed growth even more, deepening the recession and dashing hopes of a speedy and significant recovery.
Even companies that had borne the brunt of the recession during most of 2001 were hurt by the impact of Sept. 11. Poorly run companies were hit hardest according to Dr. Fred Zimmerman, professor of manufacturing systems engineering and international management at the University of St. Thomas in St. Paul, MN. "Manufacturers that had been neglecting their base product and not investing in their factory wisely were left with no cash and no future," he says.

Signs of the recession

Standard & Poor's Industry Surveys indicates that the recession in manufacturing may have begun in early 2000. "The factors that caused the recession that began in March 2001 were manufacturing-related," says David Huether, chief economist for the Washington, D.C.-based National Association of Manufacturers (NAM) since 1997. Signs of this recession included order slowdown, inventory build-up and reeling inflation. The results: a record number of bankruptcies, disappointing earnings and layoffs.
As early as 1999, according to Zimmerman, manufacturers were seeing an imbalance between orders received and outgoing shipments. After ramping up to handle the peak times, demand slowed, and manufacturers got stuck. They found themselves left with added capacity and stockpiles of inventory. They had no choice but to cut production and sell off inventory. "When the dust from the '90s expansion settled," says Optiant's Braatz, "A lot of companies were caught by surprise."

Slowing production in response to a decline in orders and inventory stockpiles makes business sense, but it causes a ripple effect among a manufacturer's business partners. The ball gets set in motion for a recession.
Another sign of this recession was rising inflation. In 1999, the inflation rate was only 2.2%. But as energy prices rose into 2000, so did the inflation rate, by more than a percentage point. "Energy costs spiked and interest rates were high so the cost of doing business was high," says Huether. "Manufacturers had no pricing power, which squeezed earnings."
The trend accelerated into 2001. A record 230 public companies filed for bankruptcy in 2001, according to BankruptcyData.com. This was a 25% increase from a year ago. Steelmakers Bethlehem Steel, (Bethlehem, PA), and LTV Corp. (Cleveland, OH) and energy trader Enron Corp. (Houston, TX) were some of the more prominent Chapter 11 filings in 2001.
Acknowledging "the relentless price pressure," in their 4Q earnings release, automaker General Motors, posted revenue numbers $5 billion dollars less than a year ago. They also announced that they were suspending annual incentive awards for GM executives and profit-sharing payments to hourly workers.
Likewise, Rockwell Automation, one of the largest makers of factory-automation equipment, based in Milwaukee WI, has posted reduced earnings since 3Q 2001, citing a rapid and pronounced deterioration in business conditions in the U.S. industrial automation markets. In a recent earnings release, CEO Don Davis said the U.S. manufacturing sector was experiencing its most significant decline in several decades. "When a company starts seeing signs of economic slow down," says Zimmerman, professor and author of *The Turnaround Experience: Real World Lessons in Revitalizing Corporations,* "a good company will first cut its executive pay," as GM did. "But, downsizing is the more targeted response to an economic downturn."
And downsize the manufacturers did. The sector lost 8% of its workforce in 2001. There were more than 2.6 million reported job cuts overall, according to the Bureau of Labor Statistics of the U.S. Department of Labor, which was three times the number of layoffs in 1999. More than half of those layoffs &#150 1.8 million &#150 were in manufacturing during the months of July through December 2001.

Sept. 11, 2001: Uncertainty management

The events of September 11 were a defining moment in the economic cycle that accelerated the scope and intensity of the economic downturn. Forty percent of the layoffs were done after the tragic events of September 11. By the end of 2001, the unemployment rate was 5.8% versus 4% a year earlier. Productivity suffered and the damaging effects of anthrax scares and new security requirements stole valuable time from normal business operations.
"We had been seeing a softening in the market for well over a year," says Ruth Hurd, publisher of Thomas Register, New York, NY. "But it was manageable. After September 11, the bottom dropped out. People couldn't focus, orders were not being filled and business was not being done."
Uncertainty breeds market volatility and decline. Businesses don't know how to plan; expectations are not met. Although physical damage was localized in the New York and Washington, D.C., areas, logistic and emotional damage reverberated throughout the U.S. and the world. "We did not foresee the dramatic impact an

event like Sept. 11 would have on business flow," says Steve Stall, business manager of plant services for Rockwell Automation Global Manufacturing Solutions, Milwaukee, WI. "Our sensitivity toward the potential for disaster has been greatly heightened." From the rubble, a new business goal may have emerged. Manufacturers were now forewarned that they should prepare for the unexpected, which includes strategy and planning for business continuity and disaster recovery.

Positioning is everything

With or without a recession, companies are constantly evaluating market conditions to position themselves to be "recession proof." After Sept. 11 they want to be disaster-proof, too.

Consider Rockwell Automation, formerly Rockwell International Corp. Through a series of acquisitions and spin-offs in the 1990s, it shed its image as an aerospace and defense company to position itself as a leader in industrial automation. In July 2001, it spun-off of the Rockwell Collins aviation electronics and communications unit to strengthen its core automation business.

Further positioning itself to quickly respond to the changing market, Rockwell management looked at the structure of its core business in 1999-2000, according to Mike Laszkiewicz, vice president, Asset Management, Rockwell Automation. In July 2000, the company said in a press release that it would realign its industrial automation business "to sharpen its focus on the marketplace."

Under the new structure, five business groups were consolidated into three: Global Manufacturing Solutions; components and packaged applications; and the automation control and information (of which the asset management group is a unit). In a press release, Rockwell chairman and CEO Don H. Davis said the new structure would enable Rockwell Automation to respond even faster to changing market dynamics. Echoing Davis' sentiments, Laszkiewicz said that the formation of the Global Manufacturing Solutions group was in response to changes in the customer marketplace, which included economic demand, financial pressure, and low ROIs on maintenance business. "Our customers told us their resources to support maintenance weren't there anymore, and that they needed a hand managing performance to improve their financial position," says Laszkiewicz.

Recognizing that a new market was emerging from the slowing economy, Laszkiewicz' asset-management unit was positioned to help companies improve asset utilization and realize higher RONA. "As the economy got tougher, we got measured on how well we helped our clients reduce costs," says Laszkiewicz.

The consolidated focus on services that make up the Rockwell Automation Global Manufacturing Solutions group was a shift in company focus from a component manufacturing/repair perspective to a service-oriented business. Production in the Rockwell component business fell with the worsening economy, but demand for its asset-management services increased. Business manager Steve Stall was at the company when the services group focused solely on repair of the Rockwell Automation products. The company has come a long way since then, according to Stall. "We now manage the MRO process," he says. "We supply embedded asset managers who concentrate on the RONA equation."

Another company that repositioned itself to meet changing market conditions is Berglin Corp., East Wenatchee, WA. Berglin manufactures a variety of products for the industrial market, including furnace equipment, printing presses, and chairs. In

1996, founder and CEO Scott Berglin says his manufacturing engineering company (MEC) was feeling the pinch of high energy costs in its high-rent San Francisco location. To remain competitive, the company moved its operations more than 600 miles away to economically depressed Douglas County, in Washington state. The move decreased not only the company's energy costs, but its labor costs as well. In the heart of the Washington apple-orchard district, even shipping and transportation costs were at a discount in Wenatchee. Furthermore, says Berglin, "Because of our ability to relate to customers over fiber optic lines, distance does not really exist" for many aspects of the business.
Both Rockwell Automation and Berglin Corp. are companies that were able to see beyond the soaring and inflated market in the '90s. With an eye to future markets they positioned their companies to be viable in the times to come.

Responding to the recession: Internal scrutiny

The combination of the recession and the events of Sept. 11 was devastating in some cases, and embattled manufacturers faced new challenges. But while the economic climate may have changed, one aspect of modern manufacturing had not: the basic rule of economics that says to make a profit, revenue must exceed expenses. If orders slow, management has two choices: to bring in more revenue or cut expenses. Because money is hard to pull out of people during a recession, says Mike Juras, founder and president of PDS Technology, LLC, companies often look internally to cut expenses.
PDS Technology, based in Royal Oak, MI, produces a Web-based product-development system that links manufacturing and distribution. "Companies can take the opportunity to see where they can make cuts," says Juras, "which requires understanding and improving their processes." Juras, a former senior executive and manufacturing engineer for General Motors and Venture Industries, claims it's never too late for an operation to become lean. "In times of prosperity, companies become complacent," he says. "They waste a lot of money, without purchasing value."
During an economic downturn a company is compelled to evaluate its processes and rid them of waste accumulated during fatter times. The goal of internal scrutiny and cost cutting is producing a lower-cost, higher-quality product in demand by the current market, says Zimmerman of St. Thomas University. He cites Nucor, a manufacturer of steel products in Charlotte, NC. While LTV Corp. and Bethlehem Steel were filing bankruptcy, Nucor almost doubled its stock price from its September 2001 low of $34 per share to a high in February 2002 of $57 per share. Zimmerman attributes its success to its decision to roll its steel on the premises rather than ship the ingot to other locations. This elimination of waste in its steel-rolling process increased its productivity three times, he says.
Other companies have turned to the Internet to cuts costs and keep sales up when the recession hit. From September to the end of 2001, for example, CEO Berglin says his company used the Internet to sell its services globally. Two factors contributed to his decision, he says. First, the high cost of face-to-face sales calls, and, second, the increasingly common business practice of denying salesmen face-to-face meetings, especially during a recession. In 2002, the challenge for manufacturers will be to find value in Web technology that may have been flippantly purchased several years ago.

Recovery and the future

At some future date, NBER will determine the date of the recession's trough, marking its end. Signs of bottoming out have already appeared. In the same month that the NBER officially announced the recession, for example, *Business Week* magazine cited a Commerce Department report that said factory orders increased in both October and November 2001. These back-to-back increases were the first indicators in nearly a year that the manufacturing sector might be on the mend. Steelmakers, chip and chemical companies saw enough demand to raise their prices.

Recent economic reports for 4Q 2001 indicate that personal incomes, consumer confidence, spending and home sales are on the rise. Before the latest GDP numbers came out in late January, surveys like Thomas' Leading Indicator and the Blue Chip Economic Indicators forecasted that the economy would grow at a 0.7% annual rate in the first three months of this year, a sign of a mild recovery.

The latest GDP numbers, however, were a surprise and much better than expected, according to NAM economist Huether. "Energy prices have dropped, interest rates are down, and a lot of inventory has been worked off." The GDP increased in the fourth quarter, says Huether, mostly due to personal consumption growth, namely automobiles. The 0% financing prompted consumers to buy cars, rather than delay purchasing, which is the more typical response when a recession hits. With the increase in automobile spending factored out, the GDP rose only 0.2%.

More encouragement has come from Alan Greenspan, chairman of the Federal Reserve. He said in a press release that the forces restraining growth of the U.S. economy are "diminishing." The Federal Reserve lowered its benchmark interest rate for an 11th time in December, but only as "insurance," he said. This cut is expected to be the last.

Unemployment may linger and even rise after other signs of the recession fade because companies will still be reluctant to hire. Some economists predict the jobless rate will reach 6.5% this summer, plateau, then start to decline in the fall or winter.

"The extraordinary growth we saw in the '90s may have been an anomaly," says Mike Laszkiewicz, Rockwell Automation vice president. "But people are still looking for comfort and convenience. I think we will see a period of technology-based growth that will again improve the standard of living." Although some analysts anticipate the economic turnaround will be apparent by mid-year 2002, Laszkiewicz thinks it will take longer. "The recovery so far has been difficult. The trough will probably persist throughout 2002 and we won't see growth across the board until sometime next year."

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