

The United States Is Losing Its Capacity to Manufacture

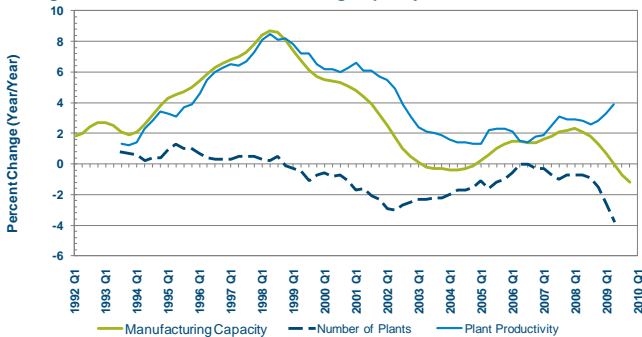
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Determinates of Manufacturing Capacity

Figure 1

Change in Determinates of Manufacturing Capacity



Source(s): Federal Reserve and Manufacturers Alliance/MAPI

Manufacturing capacity¹ is the product of the number of plants multiplied by factory productivity. Figure 1 shows that capacity grew at an accelerating rate from 1994 to mid-1998. The internet and communications revolution sparked a generalized capital spending boom (sometimes called the “dotcom boom”) in the second half of the 1990s. Some economists at the time explained the faster economic growth during this period as the delayed benefits of previous computer technology investments. Manufacturing capacity grew 1.9 percent from the fourth quarter of 1993 when compared to the same period one year previously. Each year thereafter the pace of capacity growth accelerated until capacity reached its peak growth rate in the second quarter of 1998, 8.7 percent above the level one year earlier. During the dotcom boom period, the number of manufacturing plants was growing slightly—about one-half of one percent a year from 1993 to 1998. Plant productivity, however, was rapidly accelerating and accounted for almost all of the gain in capacity.

The end of the dotcom boom in 2000 and an overvalued dollar marked a turning point in U.S. manufacturing capacity growth. Capacity continued growing from 1999 to 2002 as capital investments made before the 2001 economic downturn became operational. The pace of growth, however, decelerated and eventually ended in 2003. The composition of manufacturing capacity also changed as the pace of growth waned. The number of plants began to decline at the end of 1998 and fell, on average, 2 percent per year from 1999 to 2004. The downturn in manufacturing plants eventually overcame a decelerating growth rate in plant productivity which caused capacity to fall 0.3 percent in 2003 and 0.1 percent in 2004², marking the first time since manufacturing capacity data began in 1948 that capacity had declined.

United States manufacturing capacity grew modestly from 2005 to 2008, and then fell last year. In the fourth quarter of 2009, total capacity dropped 1.2 percent from its level in the

fourth quarter of 2008—marking the worst decline in capacity in at least 60 years. The shedding of manufacturing plants also worsened. At the trough of the 2008-2009 recession in the second quarter of 2009, the number of plants was 3.7 percent below the same period one year earlier and factory productivity (which accelerated in the recession) was 3.9 percent above the previous year’s levels. Data for manufacturing capacity are unavailable for the second half of 2009 so it is not yet possible to decompose the decline into changes in plant and productivity. Nevertheless, labor productivity in the second half of 2009 suggests that factory productivity continued to grow while the shutting of plants accelerated.

Plant Dynamics

Figure 2

Manufacturing Plant Dynamics



Source(s): U.S. Bureau of Labor Statistics and JOLTS Program and Manufacturers Alliance/MAPI

The number of manufacturing plants is a static concept, but the underlying fact is that the change in plants is very much a dynamic process of creative destruction. Manufacturing plants are continuously opening and closing and only the net change determines the trend in the stock of plants. Figure 2 shows the percent of manufacturing plants that opened and closed in each three-month period from the third quarter of 1992 to the second quarter of 2009. When the stock of plants was growing from 1992 to 1998, there was a delicate balance between the rate of plant openings and plant closings. Over this period, on average, 3.45 percent of all manufacturing plants closed each quarter and 3.51 percent of all plants opened for business.

Creation and destruction in manufacturing plants has diverged since 1998. The rate of plant closings maintained a flat trend. The average rate of closings per quarter was 3.45 percent from 1992 to 1998 and 3.47 in 1999 to 2009. Closing rates, however, do fluctuate with the economic cycle. The percent of manufacturing plants that closed spiked in both the 2001 and 2008-2009 recessions, reaching 3.9 percent in late 2001 and 4.3 percent in early 2009. When the industrial sector returned to strong growth in 2006 and 2007, the plant closing rate fell back to 3 percent.

¹ Estimates of capacity attempt to capture the concept of sustainable maximum output, which is the greatest level of output a plant can maintain within the framework of a realistic work schedule, after factoring in normal downtime and assuming sufficient availability of inputs to operate the capital in place.

² Fourth quarter to fourth quarter the previous year.

The reason for the decline in manufacturing plants in the decade starting in 2000 was that the rate of plant openings fell in the 2001 recession and never recovered. From 1992 through 1998 the average rate of manufacturing plant openings was 3.5 percent per quarter. The plant opening rate fell to 2.7 percent per quarter in the 2000s. The slower rate of investment in new facilities created a wedge where closings consistently exceeded openings, so the stock of manufacturing plants declined.

Capacity by Industry

Change in Capacity by Industry

Industry	Percent Change (12/07-to-01/10)	Industry	Percent Change (12/07-to-01/10)
Capacity		Capacity	
Textile mills	-12.7	Machinery	-0.5
Textile product mills	-11.0	Natural gas distribution	0.0
Printing, related support	-9.7	Coal mining	0.3
Furniture, related product	-8.2	Computer, peripherals	0.5
Apparel	-6.9	Electrical equipment, appliance	1.3
Wood product	-5.1	Petroleum, coal products	1.7
Motor vehicles, parts	-4.3	Aerospace, misc. transport eq.	2.2
Paper	-3.2	Food	2.4
Plastics, rubber products	-2.0	Electric power	4.9
Fabricated metal product	-1.7	Miscellaneous	4.9
Nonmetallic mineral product	-1.3	Metal ore mining	6.3
Primary metal	-0.8	Semiconductors	15.6
Chemical	-0.7	Communications equipment	22.5

Source(s): Federal Reserve and Manufacturers Alliance/MAPI

Underlying the recent decline in manufacturing capacity is a wide variation of capacity change by industry. The table shows the percent change in capacity from the peak of the cycle in December 2007 to January 2010, for 26 industries. Industries are ordered in the table from the largest decline in capacity to the greatest increase in capacity.

The “Great Recession” accelerated creative destruction. Textile mills and textile product mills top the list of industries that have seen the largest decline in capacity over the last two years. Textile mills lost 12.7 percent of its capacity while textile product mills shed 11 percent of capacity. Upstream industries, like apparel, lost 6.9 percent of capacity, and furniture shed 8.2 percent. The combination of declining consumer spending, unfavorable trade balances, and poor prospects for recovery caused a dramatic decline in production and rationalization of capacity in these industries. The printing industry lost 9.7 percent of its capacity in 2008 and 2009 and the paper industry saw a 3.2 percent drop incapacity as technology moved from print to digital and displaced print shops.

Many historically cyclical industries experienced severe declines in production over the last two years but have exercised restraint in cutting capacity. For example, wood products, motor vehicles, fabricated metal products, primary metals, and machinery industries currently have utilization rates in the mid-50 to low-60 percent of capacity range. Business leaders in these cyclical industries apparently believe that demand will return in the coming economic expansion so they are willing to hold on to excess capacity for now.

At the other end of the spectrum, there was strong growth in capacity for communications equipment and semiconductor industries. Communications equipment capacity increased 22.5 percent over the last two years and capacity rose 15.6 percent in semiconductors. In both of these industries, technological progress such as the increased speed and capability of the product are factored into the gains in capability. Some other industries listed in the table that increased capacity during the recession include metal ore mining, electric power, food, aerospace, petroleum and coal products, and electrical equipment and appliances.

Conclusion

The manufacturing base declined in 2009. Capacity fell last year due to a sharp reduction in the number of manufacturing plants amid acceleration in factory productivity. There was, however, a declining trend in the number of plants in the current decade. Business dynamics show that the rate of plant closings is not the primary factor in the decline in the stock of manufacturing plants. What accounts for the decline in the number of factories is a much slower rate of plant openings. Manufacturers are just not expanding aggressively in the United States, and the pace of innovation that brings new products (and factories) to market is subdued.

The 2008-2009 recession drove the factory operating rate to only 69 percent in January 2010. Fortunately, the manufacturing utilization rate is up from its record low of 65 percent in June 2009. Excess capacity, nevertheless, is deep and widespread across the industrial sector. The extent of capacity paring within each industry seems to depend upon the forecast or hope of an eventual return to normalcy in demand trends during the coming economic expansion. Should business regulations and taxes become onerous and/or confidence in the industry recovery wane, there is the potential for further major cuts in the industrial base.