

U.S. Gear Consumption Continues to Grow

The recent growth in gear shipments has worked to offset the distress imposed on the industry during the difficult five-year period from 1999 through 2003. During that period, the industry had two recessions causing gear shipments to contract sharply. At the low point of the second recession, domestic gear shipments slipped to their lowest level in more than ten years and it was an open question as to whether or not the industry would ever return to its previous peak level of activity. Fortunately, the double-digit growth in shipments in the last 30 months has been enough to not only allow the American gear industry to completely recover from its two recent recessions but also to begin the process of expansion beyond its previous peak level of activity.

As the industry proceeds along its latest expansion path, it is a good time to compare this short-run performance in gear shipments with the long-run trends that underlie the short-run behavior. (Please note that the “gear industry” being described in this article consists of the open market for gears and drives and thus excludes the large vehicular gear captive shops. The industry discussed in this article is defined by the North American Industrial Classification System as “Speed Changers, Industrial High Speed Drives, and Gear Manufacturing” and is covered by NAICS Code 333612.)

Using data from the American Gear Manufacturers’ Monthly Marketing Trend Report, one can calculate the long-run trend growth in gear shipments. Statistical analysis of the historical data suggests that over the last 20 years, the trend growth in domestic gear shipments is about \$60 million per year. Comparison of the current values for gear shipments in each year with the trend

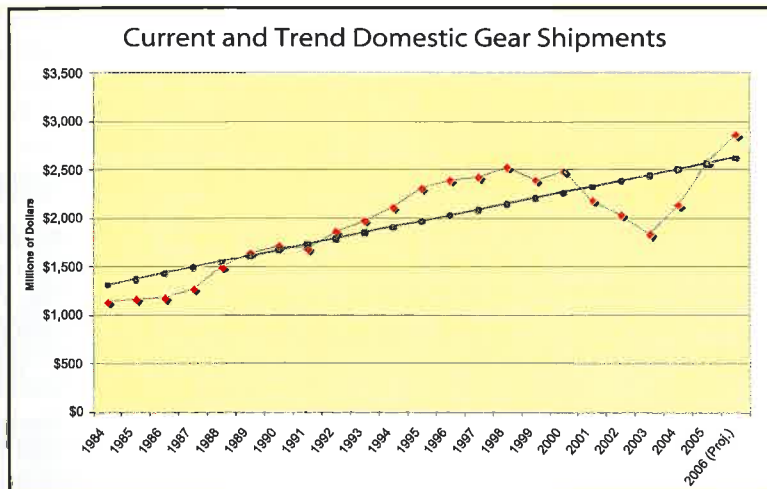
values provides insight into how well the industry is doing relative to its long-term average.

For example, the figure below presents the current and trend values for domestic gear shipments over the last 23 years. The figure shows that there are five distinct sub-periods, each with its own market dynamic. Early on, the industry was recovering from the severe 1982-1983 recession, and its performance was below trend. The gear industry reflected the economy during that period, as it was slow to recover from the recession and it really did not get back to its trend growth level until about 1989. The late 1980s and early ’90s then brought a period of steady but modest

growth, as the industry first began dealing with international competition and began a period of consolidation. During this sub-period the industry grew along its trend, and this modest growth period ended with the 1990-1991 recession and a mild downturn in gear shipments.

The decade of the 1990s was generally a good period in the gear industry as it benefited from the general growth in economic activity. From 1992 through 1998, the average growth in domestic shipment was double the long-term trend value, at just more than \$120 million per year. Although growth had slowed by the end of the decade, the ’90s ended on a relatively positive note as industry shipments were still above trend values.

Then came the severe manufacturing recession of 2001. This caused a severe recession in the gear industry that continued into 2002 and the first half of 2003. By the time the industry had bottomed out, domestic shipments had fallen by more than 25 percent. Fortunately, the industry was able to respond to this crisis and take advantage of the current manufacturing expansion. The final sub



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Eye on the Economy

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period features the strong recovery in 2004 and particularly 2005 and has placed the industry back along, and even a bit above, its long-term trend.

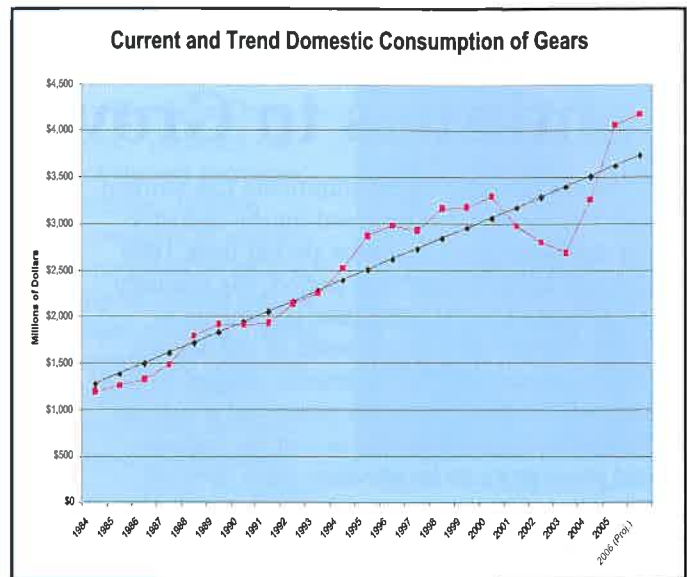
One of the critical economic forces shaping the American gear industry and influencing its short-run dynamics described above is the total consumption of gears in the United States. At first blush, this total consumption might appear to be the same as total domestic shipments, so no further insights can be gained by analyzing it. But this is not the case, for two reasons. First, "domestic" shipments are defined by the location of production, not the location of consumption. The "domestic" modifier refers to the fact that the gears and drives are produced domestically but includes shipments that are destined for U.S. market and exports. Consequently, domestic shipments include two sources of demand for the domestically produced gears: the United States and abroad. Second, the presence of imported gears and drives means that the domestic consumption of gears in the United States will be larger than domestic shipments to the U.S. market.

Apparent Domestic Consumption

To keep these potentially disparate influences straight, economists have defined a concept called apparent domestic consumption (ADC). Apparent domestic consumption subtracts the exports of gears from domestic shipments and adds the gear imports. ADC is thus a measure of the consumption of gears in the U.S. market.

The short- and long-run performance of the consumption of gears in the United States is presented in the figure atop this page. While the graph looks similar to the domestic shipments graph, there are some key differences. First, the trend growth for domestic consumption is much larger than the trend growth for domestic shipments. The consumption of gears in the U.S. grew an average of \$110 million per year over the last 20 years, nearly double the growth in domestic shipments. Second, as a result of this stronger growth, the current level of domestic gear consumption is well above the level of domestic production. In 2005, domestic shipments were about \$2.6 billion, but domestic consumption of gears was just over \$4.0 billion.

To understand where the gap comes from, one can calculate the trends for the components of ADC. The level of ADC is calculated by taking the level of domestic shipments, subtracting the level of exports, and adding the level of imports. The trend growth in ADC can be calculated in a similar manner. In other words, the annual trend growth in domestic consumption of gears (\$110 million) is equal to the trend growth in domestic shipments



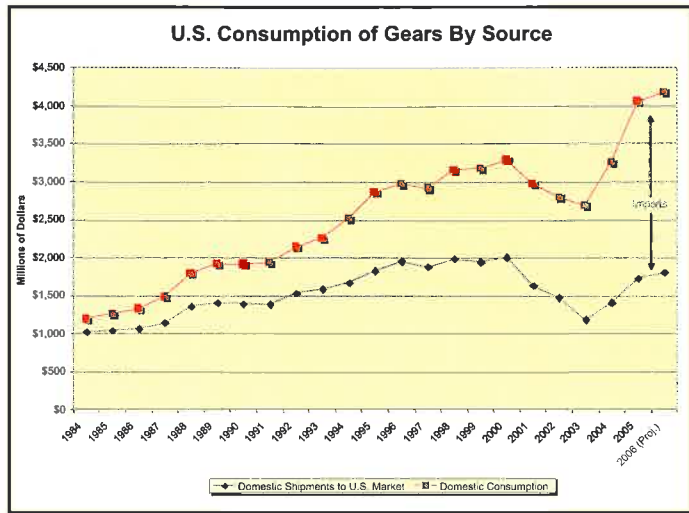
of \$60 million minus the trend growth in exports of \$30 million plus the trend growth in imports of \$80 million. While this calculation may appear to just be an example of fun with mathematics, it actually can provide some useful insights into the forces influencing the domestic industry. Two main implications jump out.

First, the numbers imply that there is an ever-widening gap between domestic consumption and domestic production. The trend growth in imports is more than twice the trend growth in domestically produced shipments to the domestic market. Over a period of 20 years, this type of disparity inevitably means that the import penetration level will rise dramatically. And indeed it has. Imports' share of ADC has grown from 5 percent in 1984 to 33 percent in 1994 to 57 percent in 2004. While one must always be cautious in putting too much weight on the accuracy of the reported levels of gear imports, the trend is unmistakable.

In addition, the increased importance of imports in the U.S. market has implications for the gear market's short-run dynamics. For example, much of the increase in domestic demand since the last recession has been filled by imports. Since the depths of the recession in 2003, domestic consumption of gears and drives has increased by \$1,491 million. Of that increase, \$872 million (or nearly 60 percent) was import growth with just \$618 million coming from growth in domestic shipments to the domestic market. Clearly, the presence of imports in the U.S. market has changed the dynamic of how domestic shipments respond to growth in U.S. gear consumption.

The second implication of decomposing the trend growth in consumption is that exports have been a sustaining force for the domestic industry. Data for

total domestic shipments show that by the end of 2005 the level of total shipments had exceeded its previous peak value, indicating that the industry's recovery from the recession was complete. Had it not been for exports, however, this would not have been true. As the figure to the right shows, if one examines just that portion of domestic shipments that flow to the U.S. market (the dark blue line), one sees that it has not yet returned to its peak. Since 2003, total domestic shipments have increased by \$1,032 million, of which \$413 million (40 percent) is from increasing exports. If it wasn't for exports, U.S. industry would still be in the doldrums. This change also shows up in the long-term trend. In 1984, exports were only about 10 percent of total domestic shipments, but by 2004, that ratio had increased to one-third.



Amazing Resilience

Although this article has been a fairly dry recitation of the numbers, those numbers paint a dramatic picture of change in the American gear industry. The industry today is dramatically different from the industry of 25 years ago, and there

have been many wrenching changes along the way. The numbers cannot tell the human stories of an industry coping with the buffeting forces of globalization, but they do reflect the amazing resilience of an American industry that could easily have been swept away.

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