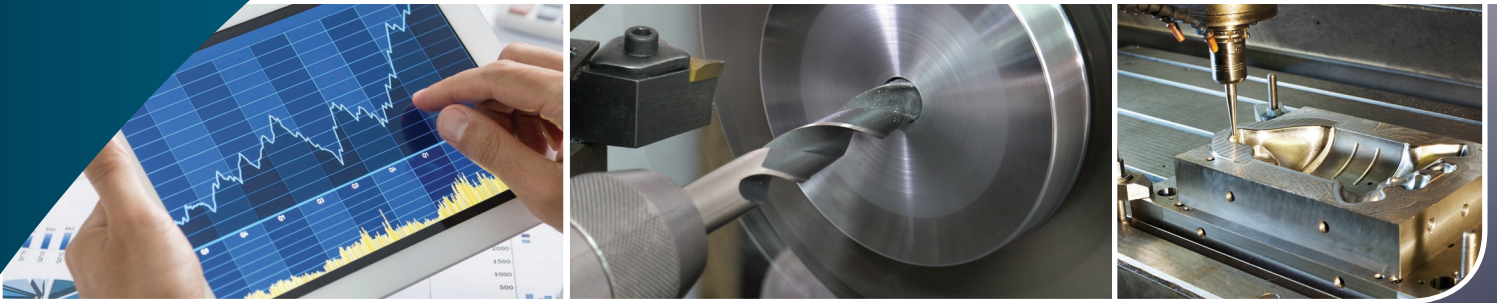




**GARDNER
RESEARCH**

2016

CAPITAL SPENDING SURVEY



MACHINE TOOLS Executive Summary

\$6.217 Billion

According to the 2016 Metalworking Capital Spending Survey by Gardner Research, U.S. metalworking facilities will spend \$6.217 billion on new metalcutting equipment, a decrease of 15% compared to our latest estimate for 2015.

| | |
|------|---------|
| 2011 | \$5.642 |
| 2012 | \$7.425 |
| 2013 | \$6.462 |
| 2014 | \$7.143 |
| 2015 | \$7.281 |
| 2016 | \$6.217 |

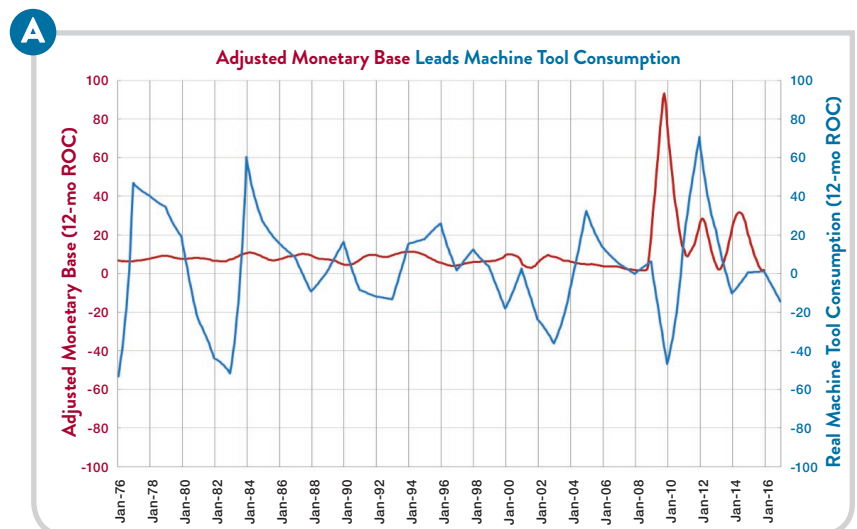
WHY THE DECREASE?

There are four factors that help to explain the forecasted decrease in machine tool consumption:

1. SLOWER GROWTH IN THE MONETARY BASE
2. EXPECTED CONTRACTION IN CAPACITY UTILIZATION
3. SIGNIFICANT DECLINE IN THE PRICE OF OIL
4. RAPID RISE IN THE U.S. DOLLAR

1. MONEY SUPPLY

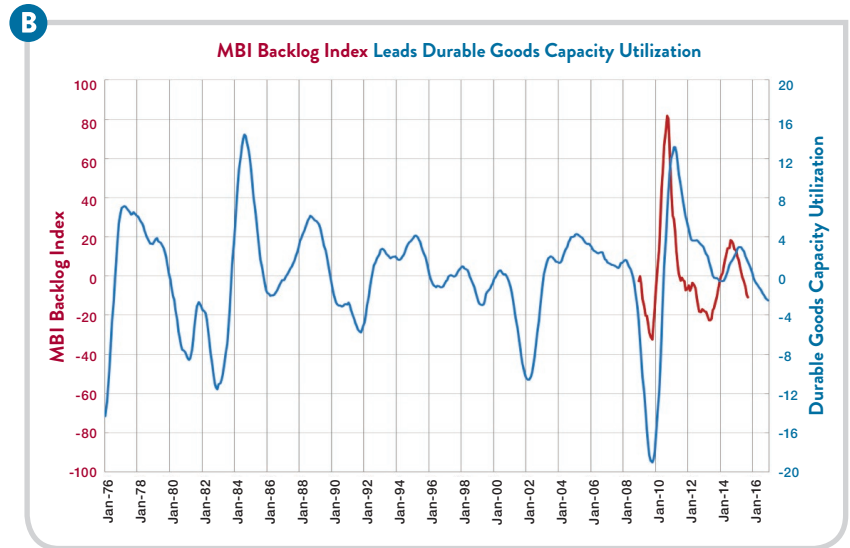
Changes in the monetary base tend to lead changes in machine tool consumption by 24 months. Despite rapidly accelerating growth in the monetary base in the first half of 2014, the growth in machine tool consumption was relatively weak in 2015. Since its peak rate of growth in June 2014, the monetary base has been growing at a slower and slower rate. Although the monetary base never contracts on an annual basis, this slower growth indicates that machine tool consumption will contract in 2016. Also, because the last round of quantitative easing had little impact on machine tool consumption, it's unlikely that a future round of quantitative easing will have much impact either. SEE CHART A





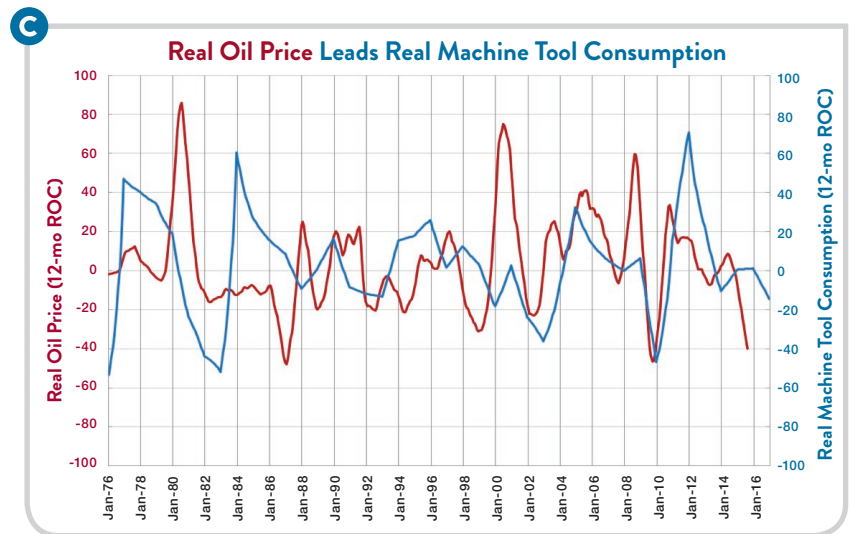
2. CAPACITY UTILIZATION

The backlog index from the metalworking portion of the Gardner Business Index is an excellent leading indicator of durable goods capacity utilization. Backlogs tend to lead capacity utilization by seven to 10 months. The backlog index peaked in March 2014, and it has been contracting at an accelerating rate since May 2015. This indicates that durable goods capacity utilization is likely to contract throughout 2016. SEE CHART **B**



3. OIL PRICE

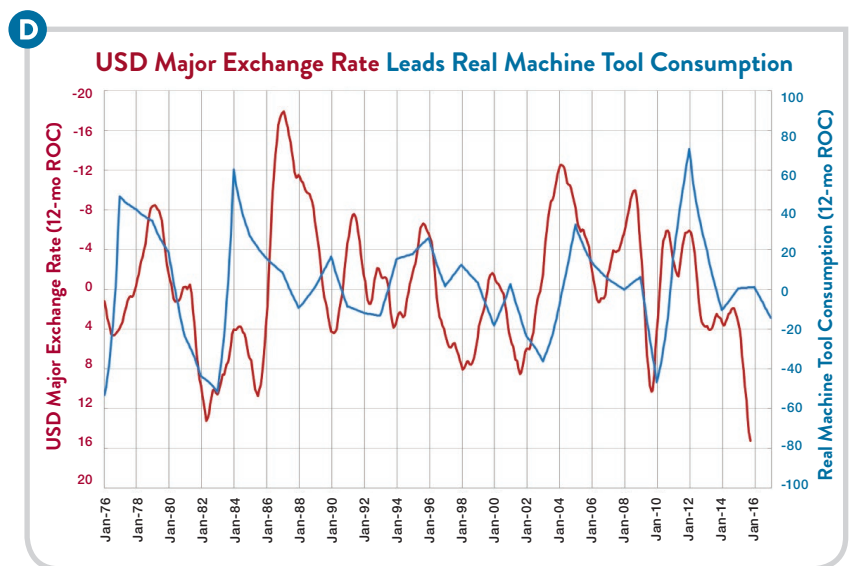
The price of oil is a leading indicator of machine tool consumption, not because the oil and gas industry is one of the largest consumers of machine tools but because the price of oil is a reflection of the general state of the economy. As of August 2015, the price of oil was contracting at annual rate of -40 percent. When the price of oil contracts at least 20 percent year over year, there tends to be a decline in machine tool consumption of at least -20% within the next one to two years. The steep drop in the price of oil in 2015 is pointing towards a contraction in machine tool consumption in 2016. SEE CHART **C**



4. USD EXCHANGE RATE

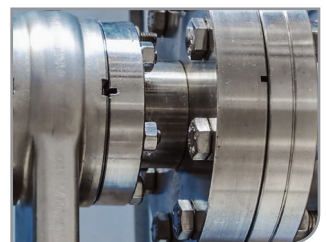
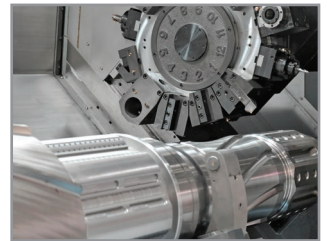
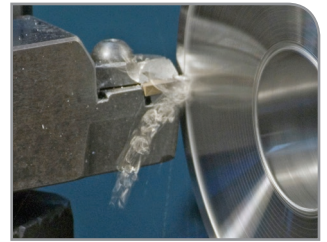
Typically, an increase in the value of the dollar leads to a decline in machine tool consumption and vice versa. As the dollar increases in value U.S. manufacturing exports become more expensive, foreign imports get cheaper, and foreign machine tool builders can lower their prices in U.S. dollars while maintaining reasonable profitability in their home country. All of these are reasons why an increase in the dollar leads to lower machine tool consumption. Note that when the dollar increases by more than 8 percent, which is at the bottom of this chart, machine tool consumption tends to contract fairly significantly.

SEE CHART **D**



Top Industries

| Top Spending Industries | 2010 | 2015 | 2016 |
|--|-------|---------|---------|
| Job Shops | 968.2 | 1,600.4 | 1,736.7 |
| Machinery/Equipment | 162.5 | 1,086.3 | 673.1 |
| Automotive | 216.8 | 888.9 | 623.2 |
| Aerospace | 307.8 | 572.9 | 442.1 |
| Non-Manufacturing | -- | 195.6 | 368.6 |
| Industrial Motors/Hydraulics/Mechanical Components | 138.8 | 311.2 | 356.2 |
| Forming/Fabricating | 407.2 | 534.0 | 286.8 |
| Electronics/Computers/Telecommunications | 116.7 | 449.7 | 285.2 |
| Other Manufacturing | 158.3 | 342.8 | 263.9 |
| Pumps/Valves/Plumbing Products | 259.2 | 226.6 | 256.6 |
| Primary Metals | 0.9 | 230.0 | 225.9 |
| Medical | 31.2 | 284.4 | 193.0 |
| Custom Processors | 6.9 | 150.2 | 114.2 |
| Oil/Gas-Field/Mining Machinery | 229.2 | 42.6 | 112.7 |
| Military | 12.6 | 21.6 | 53.7 |
| Plastic/Rubber Products | -- | 46.6 | 41.5 |
| Construction/Off-Road Machinery | 71.3 | 128.8 | 37.4 |
| Petrochemical Processors | 1.5 | 20.2 | 36.4 |
| Appliances | -- | 14.8 | 30.8 |
| Power Generation | 96.4 | 53.6 | 24.0 |
| HVAC | 10.1 | 29.3 | 18.2 |
| Hardware | 27.6 | 35.6 | 15.2 |
| Furniture | 5.5 | 12.1 | 7.5 |



Growth Areas

REGION

While the North Central-East is down slightly, the North Central-West will see a significant increase in 2016. The two regions will account for 56 percent of all machine tool spending in 2016. The South Central will continue to be adversely affected by the oil and gas industry.

| Spending By Region | 2010 | 2015 | 2016 |
|--------------------|-------|---------|---------|
| North Central-East | 707.2 | 1,954.7 | 1,805.0 |
| North Central-West | 613.2 | 1,390.6 | 1,676.7 |
| Northeast | 623.5 | 1,231.5 | 889.3 |
| West | 496.7 | 1,107.6 | 779.6 |
| Southeast | 326.4 | 702.2 | 577.4 |
| South Central | 463.0 | 894.5 | 488.8 |

North-Central - East

IN, KY, MI, OH, TN

North Central - West

IA, IL, KS, MN, MO, ND, NE, SD, WI

Northeast

CT, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT, WV

Southeast

AL, DC, FL, GA, MS, NC, SC, VA

South Central

AR, LA, NM, OK, TX

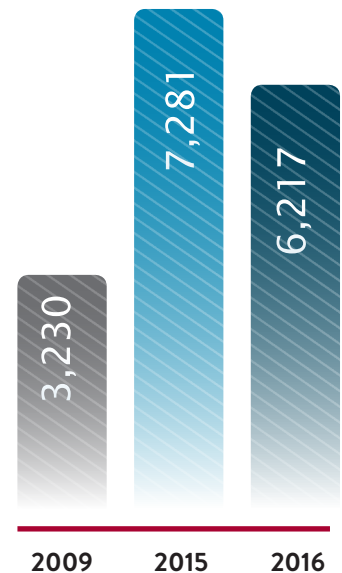
West

AK, AZ, CA, CO, HI, ID, NV, OR, UT, WA, WY

PLANT SIZE

Spending at small plants is projected to increase somewhat while spending at large plants is projected to decline significantly. However, small plants may be too optimistic in their spending plans given the state of business conditions at these facilities in the Gardner Business Index.

| Plant Size (Number Of Employees) | 2010 | 2015 | 2016 |
|-------------------------------------|-------|---------|---------|
| 1-19 | 521.6 | 937.4 | 1,190.9 |
| 20-49 | 563.1 | 863.5 | 1,159.2 |
| 50-99 | 800.1 | 882.4 | 934.7 |
| 100-249 | 738.5 | 1,848.8 | 1,089.8 |
| 250+ | 606.5 | 2,748.9 | 1,842.4 |





Spending by Equipment Types

| | 2010 | 2015 | 2016 |
|-------------------------------|---------|---------|---------|
| MACHINING CENTERS | 1,170.3 | 2,715.1 | 2,658.5 |
| Horizontal, <400 mm pallet | 225.2 | 436.6 | 486.0 |
| Horizontal, 400-800 mm pallet | 313.6 | 499.3 | 614.7 |
| Horizontal, >800 mm pallet | | 485.1 | 272.0 |
| Vertical, <20 in Y axis | 338.3 | 612.7 | 576.1 |
| Vertical, >20 in Y axis | 293.2 | 681.4 | 709.7 |
| LATHES | 549.8 | 1,109.2 | 1,044.1 |
| Horizontal, <10 in chuck | 335.6 | 579.2 | 537.7 |
| Horizontal, >10 in chuck | 143.5 | 390.9 | 420.1 |
| Manual | 61.7 | 120.6 | 82.8 |
| Vertical | 9.0 | 18.5 | 3.5 |
| GRINDING | 321.7 | 755.3 | 560.3 |
| Centerless | 43.6 | 74.9 | 40.6 |
| Creep Feed | | 35.5 | 1.7 |
| Cylindrical | 34.8 | 147.7 | 141.8 |
| Flat/Surface | 43.3 | 174.1 | 93.9 |
| ID/OD | 102.8 | 168.3 | 65.1 |
| Internal | 54.4 | 48.5 | 30.1 |
| Other | 42.8 | 106.3 | 187.1 |
| TURNING CENTERS | 141.5 | 279.2 | 317.8 |
| Horizontal, <10 in chuck | 76.3 | 142.7 | 184.8 |
| Horizontal, >10 in chuck | 30.0 | 92.7 | 107.6 |
| Vertical | 35.2 | 43.8 | 25.4 |
| SCREW MACHINES | 104.1 | 260.3 | 194.6 |
| Swiss-Type CNC | 82.3 | 185.5 | 108.1 |
| Swiss-Type Automatic | 11.9 | 39.9 | 39.9 |
| Single-Spindle CNC | 0.5 | 2.1 | 6.1 |
| Single-Spindle CAM | 1.1 | 14.3 | 1.3 |
| Multi-Spindle CNC | 4.7 | 16.4 | 24.6 |
| Multi-Spindle CAM | 3.6 | 2.1 | 14.6 |
| EDM | 102.2 | 195.5 | 147.3 |
| Ram-type | 12.4 | 35.0 | 25.9 |
| Small hole | 20.2 | 35.0 | 6.3 |
| Wire-type | 69.6 | 125.5 | 115.1 |
| OTHER | 840.5 | 1,966.2 | 1,294.3 |
| Boring | 102.5 | 197.6 | 58.2 |
| Broaching | 4.7 | 28.5 | 13.5 |
| Drilling | 101.8 | 214.0 | 203.8 |
| Gear Cutting | 156.9 | 285.3 | 200.4 |
| Laser Cutting | 220.6 | 713.3 | 395.2 |
| Rotary Transfer | 18.4 | 61.3 | 82.1 |
| Sawing/Cutoff | 90.6 | 228.3 | 167.8 |
| Transfer/Special Purpose | 141.9 | 226.8 | 126.2 |
| Waterjet | 3.1 | 11.1 | 47.1 |

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CAPITAL SPENDING SURVEY MACHINE TOOLS EXECUTIVE SUMMARY

Methodology

Gardner Research's 2016 Capital Spending Survey for machine tools was sent to 28,000 subscribers of *Modern Machine Shop*, *Production Machining*, *Moldmaking Technology*, and *Automotive Design & Production* magazines. Surveys were mailed in mid-July, and the survey period was closed in mid-August. Respondents were asked to answer detailed questions about their budgeted spending on machine tools, testing equipment, software, and more. The responses are projected across the metalworking industry based on plant size. The survey has an error factor of +/- \$1,000,000 at a 95% confidence level for the total machine tool spending projection.

Other Gardner Research

Capital Spending Survey for Tooling and Workholding
World Machine Tool Survey
Capital Spending Survey for Plastics Processing
Media Usage in Manufacturing Facilities
Gardner Business Index
Top Shops Benchmarking Survey

View these and other Gardner Research reports at gardnerweb.com

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