

This report contains an example of what you can expect if you request the services of the Clarion University Small Business Development Center.

Sample Industry Analysis

About this report: Industry analysis reports contain a wealth of information specific to industry type. This includes current trends, opportunities, threats, challenges, and critical issues. They also contain financial benchmark information that may be used for comparison against those in the industry. This report is a critical component of understanding the current state of a given industry. The SBDC has access to all 500 industry reports.



Small Business Development Center
Clarion University

Helping businesses start, grow, and prosper.

Machine Shops

11.13.2017

NAICS CODES: 33271

SIC CODES: 3599

Industry Overview

Companies in this industry use machine tools to modify metal, plastic, and composite materials to produce finished products. No major companies dominate the industry.

Worldwide, revenue for machine shops varies with manufacturing output. Because machine shops play a manufacturing support role, often operating as de facto subsidiaries of their customers, their work tends to be local.

The US machine shop industry includes about 20,000 companies with combined annual revenue of about \$37 billion.

Competitive Landscape

Demand depends on manufacturing activity. The profitability of individual companies is linked to **engineering expertise** and **operating efficiency**. Larger shops have the ability to invest in advanced production machinery. Smaller shops can compete effectively by serving specialized customers, or by providing engineering services. The US industry is **highly fragmented**: the 50 largest companies generate about 10% of revenue.

Products, Operations & Technology

Machine shops are **intermediaries** in industrial production: generally, they receive unfinished parts or raw materials from a manufacturer, perform various operations, and return the parts to the manufacturer for further processing. They own and operate special **machine tools** that can perform a variety of operations, including drilling; boring (enlarging an existing hole); tapping (cutting threads inside a drilled hole); threading (cutting threads on a bolt); cutting; milling (removing material from a surface); and **grinding** (usually a finishing operation). These operations involve material removal, frequently with great precision. The bulk of machine shop work is performed on metal, but plastics and composite materials are also machined.

The machines that perform these operations are usually expensive and often computer-controlled. **Machine tools** vary by the type of operation they perform, the size of a piece they process, and the precision of their operations. Many are operated with **computer numerical controls** (CNC). Machine shops may own dozens of different machine tools produced by a variety of manufacturers. Modern machine shops are **highly automated**, with computer programs aiding the design of parts, as well as controlling the machines that are used to manufacture them. Parts may be moved from one machine to another manually or using **robotics**. Aside from a few US companies, many major machine tool makers are German, Japanese, or Swiss.

As the methods for machining have become more technologically complex, so too have the tools for managing shop operations. Many providers of **customer relationship management** (CRM) and enterprise resource planning (ERP) software, particularly those aimed at the small and mid-size business segments, offer application suites tailored for the manufacturing sector. There are also **software vendors** dedicated specifically to developing tools for managing machine shop processes. Such software can help businesses submit bids, order materials, schedule jobs, manage inventory, and track shipments.

Four major **operating activities** in machine shops are pre-production, machine setup, actual production, and quality control. Machine setup for a particular job can be time-consuming and can hugely affect costs. Major material costs for machine shops are the expensive, specially hardened **I bits** consumed in the various operations, including drilling bits, milling heads, cutting tools, and abrasives.

Technology

More machine shops are expected to invest in robotics to enhance productivity, reduce operating costs, and

increase competitiveness. North American industrial robot shipments rose 10% in 2016 over 2015 levels, according to the Robotic Industries Association.

Additive manufacturing, also known as 3D printing, is another technology with applications in machine shops. Additive manufacturing produces solid, three-dimensional objects by successively layering materials according to a digital design. Hybrid machine tools are being developed that combine additive and subtractive (cutting, milling, turning, and grinding) manufacturing technologies to offer machinery capable of a wider variety of parts with complex geometric shapes.

Sales & Marketing

Marketing for machine shops consists largely of direct contacts with local manufacturers. Because of the need for close technical consultation between machine shops and customers, the work of most machine shops is usually confined to a very **local area**. New business may also come through requests for proposals (RFPs) from manufacturers familiar with the company. Customers can be in a wide variety of manufacturing industries. Because work is local, companies often have a large concentration of customers in the same industry.

Major end-users include the **aerospace**, automotive, chemical, electronics, medical, **oil and gas**, and industrial machinery industries. New work is often acquired through **job bidding**. While pricing is always a consideration for new business, product quality and the ability to meet production timetables are often of greater concern.

Management expertise is very important in properly pricing a bid, since the workability of materials, the complexity of machine setup, and the capabilities of individual pieces of machinery can vary substantially.

Finance & Regulation

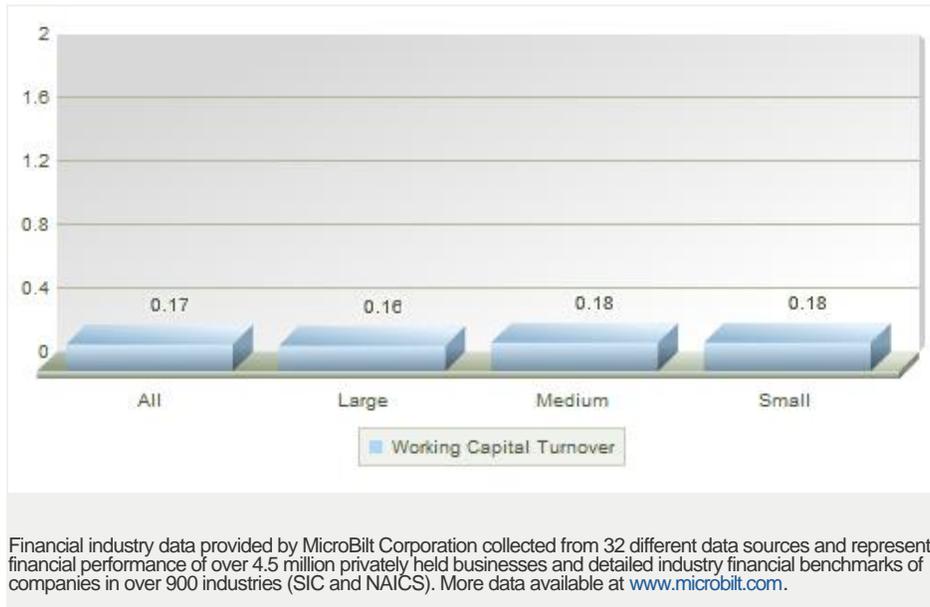
Machine shops have large investments in machinery and equipment, including drill presses; lathes (turning machines); and milling and grinding machines. Individual pieces of equipment may cost several hundred thousand dollars and can often be bought with financing provided by the manufacturer. On average, capital expenditures represent about 5% of sales. The industry is **labor-intensive**: average annual revenue per employee is about \$135,000.

The US industry's **working capital turnover** ratio averages about 25%. Shops generally don't have large investments in inventory, because customers typically provide materials. There is very little seasonality in production or cash flow, but the industry is susceptible to customer work stoppages and economic cycles, which can produce highly uneven and unpredictable cash flow. The value of inventory is usually about 10% of sales, and inventories turn about six times per year. Machine shop inventories tend to be split evenly between finished goods, work-in-progress, and raw materials.

Demand for machining services depends on the level of US manufacturing activity, which can vary significantly from year to year. Many machine shops depend directly on the health of a single end-use industry. The machine shop industry gets large amounts of business from the auto and aircraft industries and electronics and industrial machinery producers. If a major customer or industry group closes or moves manufacturing operations, local machine shops may experience a precipitous drop in demand, and collection periods and questionable accounts may increase. **Accounts receivable** average about 50 days, but collection periods tend to be longer for smaller companies (under \$5 million in annual sales).

Working Capital Turnover by Company Size

The working capital turnover ratio, also known as working capital to sales, is a measure of how efficiently a company uses its capital to generate sales. Companies should be compared to others in their industry.



Regulation

Because of the nature of working with metals, including the use of lubricants and solvents and the production of sizable amounts of metallic wastes, machine shops can have environmental pollution problems, particularly with regard to **ground contamination** and **toxic waste** disposal. Some types of machining operations can also release fine particles into the air, creating hazardous workplace conditions unless proper control steps are taken. The EPA administers environmental pollution regulations; OSHA administers workplace regulations.

International Insights

The global machine shop industry is dependent on the level of international manufacturing activity. However, because machine shops play a manufacturing support role, often operating as de facto subsidiaries of their customers, machine shop work tends to be local, and is less prone to crossing international boundaries than many other types of manufacturing.

Demand for machine shop work within a given region or country is determined by demand for other manufactured products further up the supply chain within that region. China, with its massive build-up of manufacturing capacity and factory output, is a **hotbed of machine shop growth**. China is currently the offshore manufacturing headquarters for manufacturers in the US, Canada, and Western Europe. But rising wages, a rapidly growing middle class, and higher transportation costs may prompt some western manufacturers to look for low-cost manufacturing elsewhere, often much closer to where a product will be purchased or consumed. For US companies this "nearshoring" may mean moving offshore manufacturing operations from China to Latin America, or even back to the US. For Western European manufacturers, outsourced operations might be moved from India or China to Eastern Europe. Increased investments in industrial automation technologies, including robotics, are also expected to fuel the nearshoring trend.

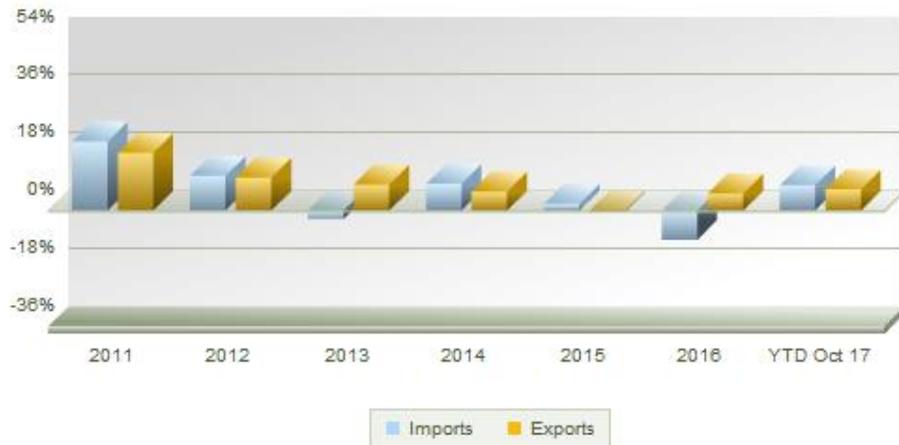
The migration of **manufacturing capacity** as it follows global trends in wages and transportation costs will affect where demand for machine shop work rises or declines. Where machine shop work will be in high demand also depends on several key industries. In 2009, China surpassed the US as the world's largest automobile market. But after years of rapid growth, China's automotive market is expected to be relatively flat in 2017, according to Scotiabank. Among emerging markets, Eastern Europe is expected to experience the strongest demand growth for automobiles. Automotive markets in Russia and South America are forecast to rebound somewhat in 2017.

Fabricated metal products are another industry that drives demand for machine shops. The rising affluence of many **emerging economies** will drive demand for machinery, appliances, and computers which would increase the need for the specialized bolts, screws, nuts, and other machined or turned products made in machine shops.

Change in Dollar Value of US Trade - US International Trade Commission

Imports of machine shop products to the US come primarily from Taiwan, China, Japan, Germany, and Canada. Major export markets for US machine shop products include Mexico, Canada, China, UK, and Germany.

3327 BOLTS, NUTS, SCREWS, RIVETS, WASHERS AND OTHER TURNED PRODUCTS



Regional Highlights

In the US, machine shops are most prevalent in states that lead in key customer segments such as aerospace, automotive, and energy. Measured by number of establishments, [California](#), [Texas](#), [Ohio](#), [Michigan](#), and [Illinois](#) are the top states for machine shops; greater Los Angeles, Chicago, and Houston lead among metro areas.

Human Resources

Machine shop jobs require **strong technical and engineering skills**, but many employees are machine operators who need only equipment-specific training. Average hourly pay for the industry is about the same as the national rate.

The safety record of the industry has improved with the greater use of computer-controlled machinery that removes the operator from the actual point of machining. However, the industry **injury rate** is still **significantly higher** than the national average.

Industry Employment Growth Bureau of Labor Statistics



Average Hourly Earnings & Annual Wage Increase Bureau of Labor Statistics



Industry Growth Rating



Demand: Depends on industrial production
 Need efficient operations and engineering expertise
 Risk: Economic health impacts manufacturing demand

Quarterly Industry Update

11.13.2017

Opportunity: US Manufacturing Technology Orders Rise - US orders for manufacturing technology, a demand indicator for machine shops, are expected to grow in 2018. Manufacturing technology orders increased 14% in August 2017 compared to the same month a year earlier, according to the Association for Manufacturing Technology (AMT). While monthly manufacturing technology orders have been uneven throughout most of 2017, both in terms of sales volumes and regional concentrations in demand, the AMT expects to see growth in 2018, both in the US and other major global markets. Among leading end-use markets, manufacturing technology orders have been strong for job shops, power generation, and aerospace, but demand from the automotive industry has slowed. Strong growth in corporate profits among durable goods manufacturers is expected to underpin sustained investments in machinery as manufacturers seek to expand production capacity. Manufacturers may also be spurred into making equipment investments while interest rates are still low in anticipation of higher rates over the next two years.

Industry Impact - Amid rising profits for durable goods manufacturers and low interest rates, machine shops may invest in new metalworking machinery ahead of anticipated interest rate increases.

8.14.2017

Opportunity: US Manufacturing Growth Accelerates - US manufacturing activity, a leading demand indicator for machine shops, grew in June 2017 at the fastest pace in nearly three years, according to the Institute for Supply Management. Overall, manufacturers reported faster growth in production, new orders, employment, order backlogs, and exports. Of 18 manufacturing industries, 15 reported growth in June. Among the industries reporting growth, several represent key customer groups for machine shops, including machinery; electrical equipment, appliances, and components; transportation equipment; chemical products; fabricated metal products; and petroleum and coal products. June's growth suggests that manufacturers are expanding even amid fading hope for near-term government action on tax reform and infrastructure spending, according to Bloomberg.

Industry Impact - If demand from the manufacturing sector remains robust, machine shops may invest in new equipment to increase productivity and production capacity.

5.15.2017

Opportunity: US Durable Goods Orders Rise - US orders for durable goods, a demand indicator for machine shops, increased 3.6% in the first three months of 2017 compared to the same period in 2016. A 5.9% rise in metalworking machinery orders may signal that machine shops are making investments in new equipment amid improved demand. Orders also improved in several manufacturing industries that represent key customer groups

for machine shops. Fabricated metal product orders grew nearly 6%, and new orders for industrial machinery saw gains of 4.3%. Orders for transportation equipment increased nearly 3%, led by motor vehicle bodies, parts, and nondefense aerospace products. New orders for mining, oil field, and gas field equipment declined 13.2%, but the energy sector is showing signs of improvement. Recent reports by energy services firm Baker Hughes show steady gains in oil rig counts as drillers continue to increase production. However, US 2017 first-quarter GDP grew at the slowest rate in three years amid tepid consumer spending, particularly for expensive items including automobiles.

Industry Impact - Machine shops may focus marketing efforts on customer industries that are showing signs of sustained demand, including fabricated metal products, industrial machinery, and nondefense aircraft and parts.

2.20.2017

Opportunity: US Manufacturing Activity Gains Momentum - Continued expansion in the US manufacturing sector may signal a return to stronger demand for machine shop services. US manufacturing activity increased in January 2017 for the fifth consecutive month, reaching its highest level in two years, according to the Institute for Supply Management. Of 12 manufacturing industries reporting growth in January, several represent major customer groups for machine shops, including plastics and rubber products; transportation equipment; machinery; petroleum and coal products; and fabricated metal products. Overall, manufacturers reported faster growth in production, new orders, and employment. A moderating of the strength of the US dollar and a stabilization in commodity prices may be contributing to higher demand for US manufactured goods, both at home and in export markets, according to *The Wall Street Journal*. Manufacturers are also encouraged by the Trump administration's promises to reduce taxes and implement regulatory reforms.

Industry Impact - Sustained growth in the US manufacturing sector may benefit machine shop operators that serve customers in the automotive, aerospace, machinery, and energy sectors.

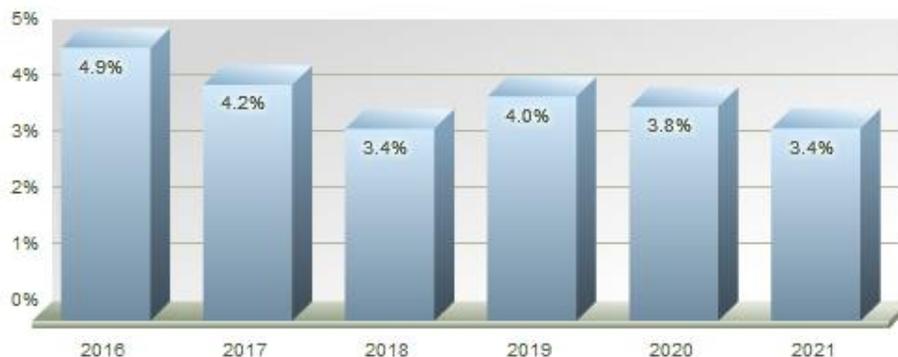
Industry Indicators

US durable goods manufacturers' shipments of fabricated metal products, an indicator of demand for machine shop services, rose 7.5% year-to-date in October 2017 compared to the same period in 2016.

US steel mill product prices, an indicator of commodity steel costs for machine shops, rose 8.8% in November 2017 compared to the same month in 2016.

Industry Forecast

Revenue (in current dollars) for US machine shops is forecast to grow at an annual compounded rate of 4% between 2017 and 2021. Data Published: September 2017



First Research forecasts are based on INFORUM forecasts that are licensed from the Interindustry Economic Research Fund, Inc. (IERF) in College Park, MD. INFORUM's "interindustry-macro" approach to modeling the economy captures the links between industries and the aggregate economy. [Forecast FAQs](#)

Companies

Company	Country	Sales
Hypro, Inc.	United States	\$295.85M
Busche Performance Group, Inc.	United States	\$175.69M
NATIONAL MACHINE COMPANY	United States	\$158.35M
Ats Assembly and Test, Inc.	United States	\$150.55M
Coast Composites, LLC	United States	\$120.79M
Goellner, Inc.	United States	\$119.90M
Tsi Group, Inc.	United States	\$116.36M
Alex Products, Inc.	United States	\$110.33M
Morbark, LLC	United States	\$107.20M
Modern Industries, Inc.	United States	\$106.83M
TSS Technologies, Inc.	United States	\$104.65M
Turbocam, Inc.	United States	\$101.78M
Triumph Structures-Los Angeles, Inc.	United States	\$94.32M
Kimber Mfg., Inc.	United States	\$87.86M
Industrial Piping, Inc.	United States	\$87.77M
L & H Industrial, Inc.	United States	\$85.53M
Thunderbird LLC	United States	\$84.98M
Smw Mfg, Inc.	United States	\$84.86M
MICHIGAN PRODUCTION MACHINING INC.	United States	\$81.04M
Innovance, Inc.	United States	\$76.63M
HI-TEK MANUFACTURING, INC.	United States	\$74.46M
Magnetic Instruments Corp.	United States	\$69.34M
ALLIED CHUCKER AND ENGINEERING COMPANY	United States	\$69.19M
Floturn, Inc.	United States	\$67.83M
Lentros Engineering, Inc.	United States	\$67.00M
Custom Air Products & Services, Inc.	United States	\$67.00M
Fulton Industries Inc	United States	\$64.69M
Connor Manufacturing Services Inc.	United States	\$62.52M
Chandler Industries, Inc.	United States	\$60.00M
David Price Metal Services Inc	United States	\$59.44M

Industry Drivers

Changes in the economic environment that may positively or negatively affect industry growth.

Data provided by First Research analysts and reviewed annually



Energy Prices Change in crude oil and related energy prices



Construction Spending Change in the overall level of commercial and residential construction spending



Commodity Prices Changes in prices for commodities, such as crops, metals, and other raw materials

Critical Issues

Dependence on Manufacturing - Demand for machining services depends on the level of US manufacturing activity, which can vary significantly from year to year. During the recession of the late 2000s, US industrial production fell about 15%, and machine shop production fell more than 25%. Machine shop shipments rose by 17% between 2010 and 2011 as manufacturing activity rebounded.

Industrial, Geographic Concentration - Many machine shops depend directly on the health of a single end-use industry. The machine shop industry gets large amounts of business from the auto and aircraft industries and electronics and industrial machinery producers. Producers of auto parts, for example, often cluster operations around a major car assembly plant. If a major customer or industry group closes or moves manufacturing operations, local machine shops may experience a precipitous drop in demand.

Business Challenges

High Capital Investment - Machine shops own and operate machinery that customers can't efficiently use themselves (usually because they don't need it full-time). Machining equipment often costs hundreds of thousands of dollars. To be able to perform all the machining work that customers want, a shop may own (or lease) dozens of machines.

Customers Shift Production to Lower-Cost Countries - To make products at lowest cost, many US companies have shifted manufacturing capabilities to lower-cost countries such as Mexico. US-based machine shops typically aren't in a position to follow customers out of the country.

Competition from Customers - Machine shop customers continually face the choice of outsourcing production to a machine shop or bringing it in-house. To keep business, machine shops must either produce work of superior quality or at lower costs. In addition to competing with other shops, they effectively compete with their own customers.

Business Trends

Unattended Operations - Computer numerical controls (CNC) machine tools can work on parts without an operator and provide continuous production if attached to automated feeding machines or robotic systems that supply fresh raw materials. Many traditional machines have been reconfigured to make unattended operations easier. For example, traditional horizontal lathes can be replaced with vertical, spindle-inverted turning machines that can more easily accept parts on their work platform.

Ceramic Cutting Tools - Many superhard materials can't be adequately machined with traditional metal-cutting tools. Ceramics technology has produced cutting tools made from ultrahard mineral composites like silicon nitride, silicon carbide, and zirconium oxide, which, while more expensive than steel, are more durable.

Additive Manufacturing - While subtractive techniques such as milling are typical in machine shops, additive manufacturing processes are becoming more prevalent for prototyping and production. Examples of additive processes include 3D printing, which creates three dimensional objects by joining successive layers of material. Because additive manufacturing processes build parts close to specification with minimal machining requirements, such technologies have the potential to help companies save on material costs and cut design and fabrication times.

Factories to See More Mobile Devices - Though initially practiced primarily by corporate executives, the bring-your-own-device (BYOD) phenomenon is spreading to US manufacturing workers, who are bringing their smartphones and tablets to work and using them to remotely monitor and control industrial equipment. As mobile devices become more prevalent on the factory floor, companies may issue ruggedized devices to employees, or mount them to the sides of machinery to wirelessly provide visualization and control of manufacturing processes. In response to the trend, leading industrial automation vendors have released more mobile apps. Going wireless comes with the security risk of cyber-attacks and other network breaches.

Industry Opportunities

Outsourcing - Many manufacturers that produce high volumes of a particular metal product incorporate machining in their regular manufacturing process. However, manufacturers that produce smaller batches of products (or that frequently make different products) can reduce costs by outsourcing the machining to independent shops. The development of "lean" manufacturing techniques, including just-in-time inventory replenishment, has favored outsourcing to machine shops that can guarantee quality and on-time delivery.

CAD/CAM - Most industrial products are now developed using CAD software. Machine tools that can machine parts directly from the software designs (such as machining centers with automatically interchangeable cutting tools) are more productive and more precise than the traditional multi-step machining process. Computer-aided manufacturing (CAM) requires close coordination between machine shops, customers, and nontraditional technical skills.

Pre-Production Design - To minimize production costs, a customer's parts can be designed to take best advantage of the various machining capabilities. Some machine shops become closely involved with customers in the design process, and can offer extensive CAD capabilities.

Advanced Machinery - Newer machining techniques such as electrical discharge machines (EDM), robotics, waterjet cutting, and lasers allow machine shops to offer new services. These techniques require machinery upgrades and advanced machinist training.

Nonmetal Machining - Although metals account for the bulk of machining that most shops do, plastics, ceramics, and composite materials are being used in more manufactured products. Such materials often require specialized machining equipment and operating skills.

Cutting Energy Costs - Because they typically operate multiple pieces of heavy equipment, machine shops face high electricity costs. Efforts to decrease energy usage include the use of high-efficiency motors that lower electricity consumption. Proper equipment maintenance is also crucial; improperly maintained tools such as leaky air compressors can significantly impact utility costs.

Executive Insight

Chief Executive Officer - CEO

Finding New Machining Applications

With increased competition, executives search for new opportunities. Advanced machinery allows machine shops to offer new services. Some machine shop owners look to nonmetal machining as more plastics and composite materials are used in more manufactured products such as medical devices. Special equipment and skills are needed to machine these materials and machine shop owners are adding these capabilities.

Maintaining Product Quality

Machine shops face competition from other shops, and some of their own customers are producing machined items in-house. Shops oversee the refinement of production processes to ensure that high quality standards are maintained, and work closely with customers to anticipate their future needs. Quality improvements such as strength and tolerance are enhanced to compete with low-priced competitors.

Chief Financial Officer - CFO

Pricing Competitive Bids Accurately

Both batch and long-term production contracts are often subject to competitive bids. Expertise is necessary in pricing bids, since material availability, complexity of machine setup, and machine capability can vary greatly. Even with repeat customers, financial executives take great care in pricing bids. Since most costs are fixed, companies' profitability depends on work volume. Properly priced bids ensure work is performed at a profit.

Financing Equipment

Machine shops have substantial investment in machinery. Equipment is very expensive and individual machines can cost several hundred thousand dollars. Equipment is typically financed by the manufacturer or a bank, or may be leased. Some machine shops buy used equipment to save money.

Chief Information Officer - CIO

Installing Machining Centers

Historically, most equipment in a machine shop performed just one function. With technological improvements, shops are increasingly installing machining centers that can perform multiple operations in sequence, increasing productivity. This allows continuous production using robotic systems with minimal manual intervention.

Installing CAD/CAM Processes

Many machine shops are installing CAD software and computer-aided manufacturing (CAM) processes to combat competitive threats and become more productive. CAD/CAM technology is more precise than traditional processes, producing higher quality finished products with lower waste.

Human Resources - HR

Hiring and Retaining Employees

Operating machines requires technical and engineering skills. Shops recruit workers with technical skills and managers with strong technical backgrounds. Keeping qualified and skilled workers is crucial, so companies strive to retain their skilled workforce even when the workload is reduced.

Training Employees

Machine tools are becoming increasingly complex and technological advances are creating new processes. More machines are computer-controlled and require specific knowledge to operate. Companies train employees on new machines and the technology required to operate them. The more technologically advanced machines have increased productivity while containing labor costs.

VP Sales/Marketing - Sales

Working Closely with Customers in Design

Most machine shops are small and market locally, and sometimes specialize in a particular customer industry. Machine shops have much contact with customers, including close technical cooperation. Shops work closely with customers in pre-production design to minimize costs and maximize part quality while ensuring customer satisfaction.

Responding to Requests for Proposal (RFPs)

Machine shops are generally located in areas with large industrial activity. Marketing efforts are localized, calling on many prospective customers in the same industry or in multiple industries. Sales teams solicit RFPs from prospects to position themselves to take business from rivals. Sales executives call on local manufacturers, promoting their company's capabilities and trying to qualify for future solicitations.

Executive Conversation Starters

Chief Executive Officer - CEO

What opportunities does the company see in nonmetal machining applications?

Some machine shop owners are adding capabilities for nonmetal machining, such as for plastics and composite materials.

What is the company's strategy to ensure product quality, while competing with low-cost shops and customer in-house operations?

Companies improve production processes and product quality, such as strength and tolerance, to compete with low-priced and in-house shops.

Chief Financial Officer - CFO

What challenges does the company face in pricing competitive bids?

Expertise is necessary in pricing bids, since material availability, complexity of machine setup, and machine capability can vary greatly.

What financing strategies does the company have for buying new or used equipment?

Equipment is typically financed by the manufacturer or the local bank, or may be leased.

Chief Information Officer - CIO

To what degree does the company use machining centers?

Machining centers do multiple operations in sequence, increasing productivity and allowing continuous production with minimal manual intervention.

How does the company use CAD software and CAM processes?

CAD/CAM technology is more precise than traditional processes, producing higher quality finished products with less waste.

Human Resources - HR**How is the company challenged by hiring and retaining skilled employees?**

Experienced technical workers and engineers are crucial, so companies strive to retain their skilled workforce even when the workload is reduced.

How are newer, more complex machines affecting the company's training?

More machines are computer-controlled and increasingly complex, requiring specific knowledge to operate.

VP Sales/Marketing - Sales**How important is close customer contact during the design stage for the company?**

Shops work closely with customers in pre-production design to minimize costs and maximize part quality while ensuring customer satisfaction.

How does the company gain access to companies that issue RFPs?

Sales executives call on local manufacturers to establish relationships for future opportunities, and sales teams solicit RFPs from prospects.

Call Prep Questions

Conversation Starters**How does the company manage changes in manufacturing industry demand?**

Demand for machining services depends on the level of US manufacturing activity, which can vary significantly from year to year.

How reliant is the company on a particular geographical area or industry?

Many machine shops depend directly on the health of a single end-use industry.

Does the company buy or lease new machinery?

Machine shops own and operate machinery that customers can't efficiently use themselves (usually because they don't need it full-time).

What production outsourcing opportunities does the company expect from customers?

Many manufacturers that produce high volumes of a particular metal product incorporate machining in their regular manufacturing process.

What computer programs are company engineers and designers using to develop products?

Most industrial products are now developed using CAD software.

How much pre-production design work does the company do for customers?

To minimize production costs, a customer's parts can be designed to take best advantage of the various machining capabilities.

Quarterly Industry Update**What recent investments in equipment have been most successful for the company?**

US orders for manufacturing technology, a demand indicator for machine shops, are expected to see further growth in 2018.

Operations, Products, and Facilities**How many shops does the company operate?**

Very few companies have more than one operation.

What types of machinery does the company have?

Drill presses, lathes, milling machines, and machining centers are typical, and come in many varieties.

What sorts of work does the company specialize in?

Many shops own machinery with special applications.

How much pre-production design work does the company do for customers?

CAD has been a growth area for some machine shops.

Do customers usually provide raw materials or buy raw materials from metal centers?

Typically, customers bring in semi-finished products for further processing.

Customers, Marketing, Pricing, Competition

How large a geographical area does the company serve?

Because of the need for close technical consultation with customers, the geographical area served is usually small unless the company provides highly specialized work.

What end-use industries are major customers?

Major end-users include the aerospace, automotive, chemical, electronics, medical, oil and gas, and industrial machinery industries.

Which end-use industries account for a large percentage of work for the company?

Customer concentrations are frequent.

How often does the company have to go through a bidding process to land new business?

Manufacturers may ask several machine shops to bid on a piece of business.

Regulations, R&D, Imports and Exports

What difficulties has the company had in meeting environmental regulations?

Machine shops may have waste disposal problems because of the lubricants and solvents they use.

How large an engineering staff does the company maintain?

Some machine shops provide pre-production engineering design services.

Organization and Management

What is the educational background of the company's senior managers?

The highly technical content of the products often requires that managers have a strong technical background.

How does the company recruit and retain engineers and machinists?

Because machinists often have special skills, companies try to retain them even when the workload is thin.

Financial Analysis

How does the company finance large-scale production?

Companies may receive progress payments on large jobs.

How much of the company's business comes from its largest customers?

In some cases, machine shops are de facto production subsidiaries of major customers.

How does the company finance major equipment purchases?

Machining equipment can be very expensive and may be financed by the manufacturer.

How often does the company have problems collecting on accounts receivable?

During business downturns, collections become more difficult.

Business and Technology Strategies

What are the long-term prospects for the company's major end-use customers?

The production facilities of some US manufacturers have moved overseas or to Mexico.

What new end-use markets might the company enter in the next few years?

Many machine shops depend highly on a single end-use industry.

What new equipment does the company plan to purchase to add advanced machining capabilities?

Some super-hard metals can be machined only with advanced technology.

What types of computer technology does the company use in the design process?

Machine shops have access to new types of computer technology that allow them to work more closely with customers to create precise parts at lower cost, and more quickly using virtual digital images of products for approval before materials are machined.

COMPANY BENCHMARK TRENDS

Quick Ratio by Company Size

The quick ratio, also known as the acid test ratio, measures a company's ability to meet short-term obligations with liquid assets. The higher the ratio, the better; a number below 1 signals financial distress. Use the quick ratio to determine if companies in an industry are typically able to pay off their current liabilities.



Financial industry data provided by MicroBilt Corporation collected from 32 different data sources and represents financial performance of over 4.5 million privately held businesses and detailed industry financial benchmarks of companies in over 900 industries (SIC and NAICS). More data available at www.microbilt.com.

Current Liabilities to Net Worth by Company Size

The ratio of current liabilities to net worth, also called current liabilities to equity, indicates the amount due creditors within a year as a percentage of stockholders' equity in a company. A high ratio (above 80 percent) can indicate trouble.



Financial industry data provided by MicroBilt Corporation collected from 32 different data sources and represents financial performance of over 4.5 million privately held businesses and detailed industry financial benchmarks of companies in over 900 industries (SIC and NAICS). More data available at www.microbilt.com.

COMPANY BENCHMARK INFORMATION

NAICS: 33271

Data Period: 2016

Last Update December 2017

Table Data Format

Mean

Company Size	All	Large	Medium	Small
Size by Revenue		Over \$50M	\$5M - \$50M	Under \$5M
Company Count	76810	57	512	12013

Income Statement

Net Sales	100%	100%	100%	100%
Gross Margin	33.2%	31.1%	34.1%	35.5%
Officer Compensation	2.3%	1.8%	2.4%	3.0%
Advertising & Sales	0.6%	0.6%	0.6%	0.6%
Other Operating Expenses	25.6%	23.6%	26.8%	27.3%
Operating Expenses	28.5%	25.9%	29.8%	30.9%
Operating Income	4.8%	5.2%	4.3%	4.6%
Net Income	2.3%	2.6%	2.0%	2.2%

Balance Sheet

Cash	9.6%	8.8%	10.2%	10.1%
Accounts Receivable	25.5%	26.7%	24.7%	24.7%
Inventory	17.2%	14.9%	19.7%	18.1%
Total Current Assets	60.1%	58.5%	62.7%	60.3%
Property, Plant & Equipment	20.8%	18.5%	20.6%	23.5%
Other Non-Current Assets	19.1%	23.0%	16.7%	16.2%
Total Assets	100.0%	100.0%	100.0%	100.0%
Accounts Payable	11.0%	11.0%	10.8%	11.1%
Total Current Liabilities	23.1%	20.7%	23.6%	25.3%
Total Long Term Liabilities	31.5%	30.2%	30.3%	33.4%
Net Worth	45.5%	49.0%	46.1%	41.4%

Financial Ratios

Quick Ratio	1.61	1.80	1.59	1.46
Current Ratio	2.60	2.82	2.66	2.38
Current Liabilities to Net Worth	50.8%	42.3%	51.1%	61.1%
Current Liabilities to Inventory	x1.35	x1.40	x1.20	x1.39
Total Debt to Net Worth	x1.20	x1.04	x1.17	x1.42
Fixed Assets to Net Worth	x0.46	x0.38	x0.45	x0.57

Days Accounts Receivable	42	40	40	46
Inventory Turnover	x8.57	x11.25	x7.45	x6.96
Total Assets to Sales	46.5%	42.4%	46.0%	52.2%
Working Capital to Sales	17.2%	16.0%	18.0%	18.2%
Accounts Payable to Sales	5.0%	4.5%	4.8%	5.6%
Pre-Tax Return on Sales	3.8%	4.2%	3.2%	3.5%
Pre-Tax Return on Assets	8.2%	10.0%	7.0%	6.7%
Pre-Tax Return on Net Worth	17.9%	20.4%	15.2%	16.2%
Interest Coverage	x3.41	x3.79	x3.05	x3.15
EBITDA to Sales	10.0%	10.5%	9.9%	9.5%
Capital Expenditures to Sales	6.1%	6.0%	6.4%	5.9%

Financial industry data provided by MicroBilt Corporation collected from 32 different data sources and represents financial performance of over 4.5 million privately held businesses and detailed industry financial benchmarks of companies in over 900 industries (SIC and NAICS). More data available at www.microbilt.com.

ECONOMIC STATISTICS AND INFORMATION

Index of Industrial Production - Federal Reserve Board



Change in Producer Prices - Bureau of Labor Statistics



VALUATION MULTIPLES

Machine Shops

Acquisition multiples below are calculated medians using at least three US private industry transactions completed between 1/2007 and 10/2017 and are based on middle-market transactions where the market value of invested capital (the selling price) was less than \$1B. Data updated annually. Last updated: December 2017.

Valuation Multiple	MVIC/Net Sales	MVIC/Gross Profit	MVIC/EBIT	MVIC/EBITDA
Median Value	0.7	1.2	3.8	2.9

MVIC (Market Value of Invested Capital) = Also known as the selling price, the MVIC is the total consideration paid to the seller and includes any cash, notes and/or securities that were used as a form of payment plus any interest-bearing liabilities assumed by the buyer.

Net Sales = Annual Gross Sales, net of returns and discounts allowed, if any.

Gross Profit = Net Sales - Cost of Goods Sold

EBIT = Operating Profit

EBITDA = Operating Profit + Noncash Charges



SOURCE: Pratt's Stats, 2017 (Portland, OR: Business Valuation Resources, LLC). Used with permission. Pratt's Stats is available at <https://www.bvresources.com/prattsstats>

Industry Websites

Association for Manufacturing Technology

Industry news. Good industry links.

Canadian Machine Tool Distributors Association

News, events, and education resources.

Canadian Tooling and Machining Association

News, events, and training resources.

Industry Glossary at Job Shop

Industry terminology.

Modern Machine Shop Online

Industry news. Archived articles about many aspects of machining and machine shops.

National Tooling & Machining Association

Trade shows. Education.

Tooling & Production Magazine

Technical issues.

Glossary of Acronyms

AMT - Association for Manufacturing Technology

CAD - computer-aided design

CAM - computer-aided manufacturing

CNC - computer numerically controlled

EDM - electrical discharge machining

NC - numerical control

RFP - request for proposal