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Manufacturing and Distribution Update

July 2009

SECOND QUARTER 2009 ECONOMIC UPDATE FOR MANUFACTURING

This information is provided to you by Schneider Downs & Co., Inc. utilizing information from First Research.

The US manufacturing sector consists of about 300,000 companies with combined annual sales of over $4 trillion. Major companies include Boeing, Caterpillar, DuPont, Ford, GE, GM, Hewlett-Packard, IBM, Procter & Gamble, Pfizer, and Tyson Foods. The manufacturing sector is fragmented: the largest 50 companies account for less than half of overall sales.

COMPETITION

Demand ultimately depends on consumer spending, but changes in demand often aren't felt immediately because most manufacturers make intermediate products. The profitability of individual companies depends on efficient production and distribution. Large companies often have large economies of scale in purchasing, production, and marketing. Small companies can compete effectively by producing specialized products. The industry is capital-intensive and highly automated: annual revenue per employee varies greatly due to the large variety of production operations but averages more than $350,000.

Computer systems and controls have steadily increased the labor productivity of US manufacturers, a 50 percent improvement in the last 10 years. Even so, US labor costs remain high and many labor-intensive manufacturers have moved production operations to lower-cost countries like China.

OPERATIONS & TECHNOLOGY

The greatest production efficiencies are often achieved by companies that specialize in a particular product. Few US manufacturers today produce everything from raw materials to finished goods. A result of specialization is that most manufacturers make products for other manufacturers. Specialization often allows a manufacturer to have expertise in manufacturing similar products or products with similar uses.

The US manufacturing industry has become highly automated in all aspects. US manufacturers spend over $7 billion annually in capital expenditures for computer equipment. Manufacturing was a lead industry in the application of enterprise resource planning (ERP) technology and in its evolution to an enterprise services architecture (ESA). Applying these technologies has streamlined business processes and reduced the number of labor hours required per unit of production.

Most manufacturers have automated their backoffice processes including accounting, order entry, inventory management, and HR. These processes are integrated, operating on common databases. Many companies have implemented ERP systems having suites of applications adapted to the manufacturing industry and based on industry best practices. Adopting industry standard packages lowers the cost of automation and gives the company flexibility in leveraging third-party applications.

To remain competitive in a global economy, US manufacturers have automated production operations using machinery, robotics, and computer control systems. Much of the equipment used in manufacturing includes programmable logic controllers (PLCs) containing microprocessors that can be programmed. These controllers can be networked to pass status and control information

Schneider Downs' Manufacturing and Distribution Industry Group

Our manufacturing and distribution industry group includes professionals from our audit, tax, technology, wealth management, and advisory practice disciplines. Our professionals have a wide range of experience in manufacturing environments, and such diversity delivers exceptional value to clients by offering different perspectives and thoughtful consideration of how today's environment has changed the playing field for manufacturers and distributors. We provide valuable insight into what companies are doing to navigate this new environment.

from machine to machine. In some larger operations, controllers are linked to servers that control processes among multiple machines. Factory systems are usually tied together using TCP/IP networking. Some factories are evolving to use wireless technology, driven in part by increasing use of radio frequency identification (RFID) tags.

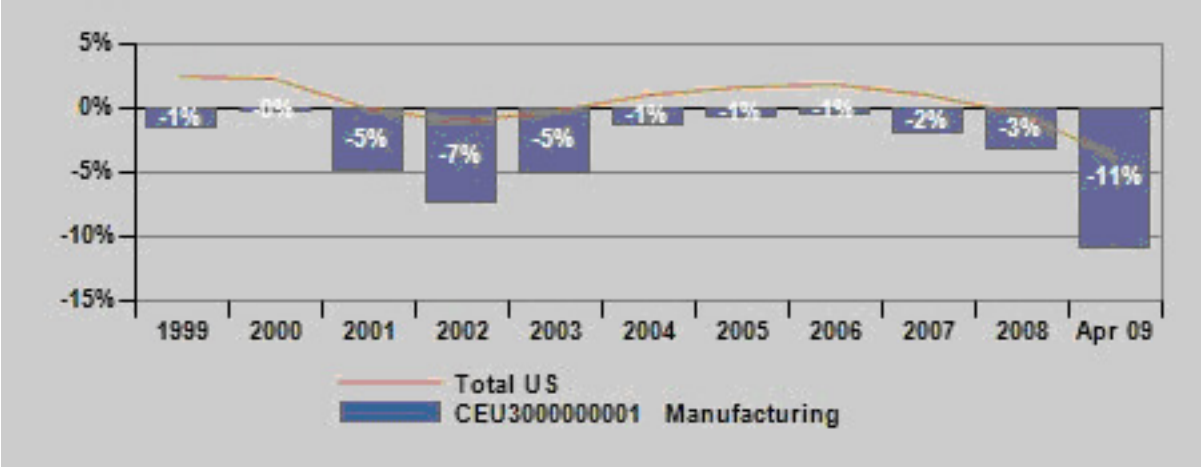
Factory floor hardware, including portable computers, is generally ruggedized so that it can perform in adverse environments. The ruggedization can include shock mounting, heat sinks, fans, and hermetically sealed units.

REGIONAL & INTERNATIONAL ISSUES

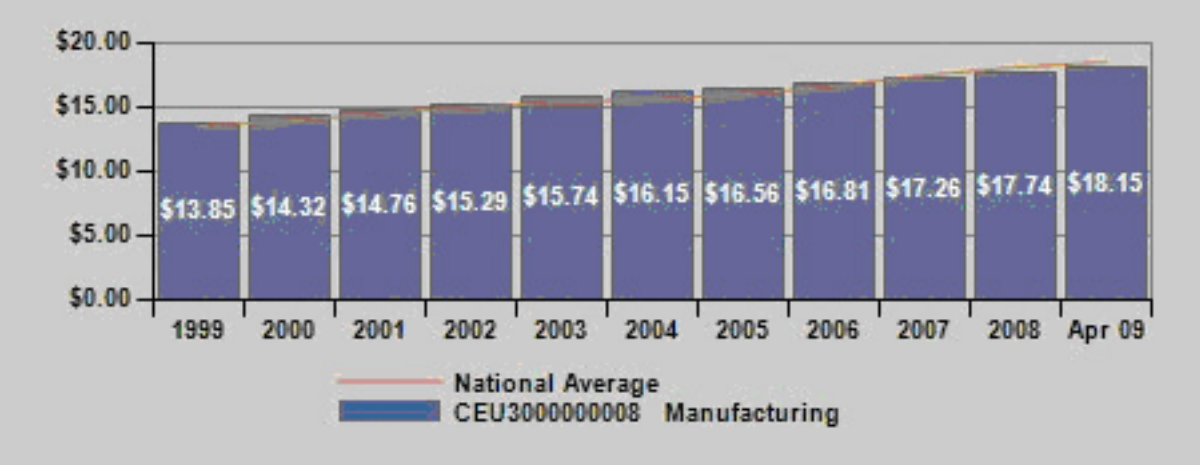
The largest concentrations of manufacturing output are in California, Texas, Ohio, Michigan, Illinois, North Carolina, New York, and Indiana. Many specific industries are concentrated in just a few states, because of easy access to raw materials or energy sources, or proximity to customers.

Exports of US manufactured goods grew only modestly in the past five years, up just 15 percent. Exports dropped sharply during the last recession, because a large portion of exports are components shipped to Canadian and Mexican factories for eventual re-entry to the US as finished products. Canada and Mexico combined take almost 40 percent of US manufacturing exports.

Many US exports are goods with high technology content: motor vehicles and parts, planes, semiconductors, computers, drugs, agricultural and construction equipment.



Industry Employment Growth
Bureau of Labor Statistics



Average Hourly Earnings & Annual Wage Increase
Bureau of Labor Statistics

RECENT DEVELOPMENTS
INDUSTRY ACTIVITY

Total US durable goods manufacturers' shipments, which indicate manufacturing sector activity, fell 18.7 percent in the first four months of 2009 compared to the same period in 2008.

The spot price of crude oil, which indicates energy prices paid by manufacturers, dropped 47.4 percent in the week ending June 12, 2009, compared to the same week in 2008.

QUARTERLY INDUSTRY UPDATE

Consumer Spending, Income Decline - Two key indicators of demand for manufactured goods, consumer spending and personal income, both declined in March 2009 compared to the previous month. Consumer spending fell 0.2 percent, the first drop in three months. Personal income declined 0.3 percent, an indicator that continued job losses are putting downward pressure on incomes.

GM, Chrysler Announce Temporary Shutdowns - Troubled US carmakers, General Motors and Chrysler, have announced they will temporarily cease manufacturing operations to clear bloated dealer lots of excess inventory. GM plans to close 13 of its plants for about 11 weeks, while Chrysler aims to temporarily shutter all of its manufacturing plants as part of its efforts to reorganize under Chapter 11 bankruptcy. The decision to close plants has created concern throughout the automotive supply chain, which reaches deeply into the manufacturing sector.

US Loses Ground on Patents - The number of patents issued to US inventors, an indicator of US manufacturing competitiveness, declined for the second straight year in 2008, and for the first time the number of patents issued to foreigners outstripped those awarded to Americans. Experts fear the increase in overseas patents is yet another sign the US is losing ground to foreign rivals in manufacturing, R&D, and innovation. The US's top three competitors for patents were Japan, Germany, and South Korea.

BUSINESS CHALLENGES

CRITICAL ISSUES

Highly Dependent on Consumer Spending - Production in the manufacturing sector depends on consumer spending and retail sales, and can change rapidly during an economic slowdown. For example, US manufacturing grew at an average annual rate of 5 percent during much of the 1990s, but dropped 5 percent during a recent recession. In some sectors, like industrial machinery, production dropped more than 30 percent.

Competition from Low-Cost Imports - US imports of manufactured goods have increased rapidly, because products with large labor content are much cheaper to produce in low-cost countries like China and Mexico. To remain competitive, many US manufacturers have moved production facilities abroad or have shifted to products with higher technology content. China recently surpassed Canada as the largest source of manufactured goods for the US.

OTHER BUSINESS CHALLENGES

Large R&D Spending, Capital Investment Required - Manufacturing companies must make large investments in production equipment and computer systems to improve efficiency, and in R&D to develop new products. US manufacturing companies annually spend over $100 billion on R&D, and over $200 billion on capital investments.

Volatile Energy, Raw Material Costs - Scarcity of resources and long supply routes contribute to frequent changes in prices for energy and for many raw materials used by manufacturers. Steel prices typically change no more than 10 percent per year, but sometimes change more than 30 percent. Crude oil and natural gas prices can move more than 50 percent within a year.

Extensive Government Regulation - To protect workers and prevent pollution, states and the federal government regulate many activities of manufacturing companies. Although designed for good reasons, such regulations add to the cost of production. Government regulations also affect imports and exports of many raw materials and manufactured products.

Dependence on Few Large Customers - Because of consolidation in many parts of the US economy, many manufacturers depend heavily on only a small number of big customers, like Wal-Mart or Boeing, for a large part of revenue. In many cases, because no alternative market exists, manufacturers are essentially production arms of their customers.

TRENDS AND OPPORTUNITIES

BUSINESS TRENDS

More Automation, Less Labor - Productivity has steadily increased in manufacturing because of the increasing use of machines and, especially, computers. Generally, the US industries that have prospered in the past decade have been those where the most automation has been possible and where technology content is high. In the past 10 years, labor productivity increased 50 percent.

Outsourcing and Leasing - To increase operational efficiency by concentrating resources on primary production and marketing functions, many companies have outsourced services they previously did themselves, such as parts manufacture, maintenance, computer and payroll services, and benefits management. As product life cycles get shorter, building proprietary assembly lines becomes less practical. Contract manufacturers have made it possible for some companies to operate without owning any brick-and-mortar factories. Many manufacturers have also increased the efficiency of their assets by leasing, rather than owning, equipment and facilities.

More Service Required - The greater technological content of many machines and products requires more complicated support such as training, maintenance, operations, and services. Some companies, like IBM, sell more services related to their product than they do the product itself. Large-scale use of computers has created the entirely new support field of IT.

Manufacturing Globalization - The development of international logistics networks that can efficiently deliver raw materials and finished products to many parts of the world has increased the reach of US manufacturers and international competitors. US manufacturers in labor-intensive industries such as apparel now have most of their production facilities abroad. Factories are frequently sited in countries for tax, labor costs, or political reasons, rather than proximity to raw materials or markets, as was the case.

More Alliances, Strategic Investments - The large resources required for many business enterprises, especially in the international sphere, encourage manufacturers to ally with other companies. In some cases, partners produce different components for a product; in others, one partner makes the product while the other provides distribution. Relationships between manufacturers and their suppliers also often take the form of alliances, with strong integration of information systems and regular production consultations. Many large companies now hold "strategic stakes" in smaller companies that are developing new products or markets, enabling them to essentially farm out their R&D efforts.

INDUSTRY OPPORTUNITIES

Technological Innovation - US manufacturers use technology to lower costs, improve products, and optimize supply chain performance. US industry spends almost 75 percent of R&D funds on product development, 20 percent on applied research, and 5 percent on basic science. The US manufacturing sector is evolving toward providing goods that either have a high-tech component or that are produced with technologically advanced equipment. Biotech and fiber optics are recent examples of expensive research technologies that rapidly evolved into manufacturing industries.

Improved Logistics - To minimize inventories and speed distribution, many manufacturers invest in distribution technology and better logistics communication. Advancements include satellite communication links with delivery trucks, cargo containers with communication capabilities, specialized cargo ships that can be unloaded in hours, and RFID tags that allow individual products to be tracked. Improved communication between suppliers and manufacturers also enable better production scheduling and product flow.

Business-to-Business Internet Communication - Many manufacturers can order parts and products through Internet sites, speeding delivery and cutting out a layer of distributors. Internet auction sites let suppliers bid to fill supply contracts. Because they cut prices and open the supply chain to more potential suppliers, industry-specific Internet sites are expected to grow rapidly. The success of these ventures is closely tied to the continuing growth and refinement of the logistics network, so suppliers can keep delivery costs low.

Improved Energy Use - Because many production techniques were designed in an era of lower energy costs, manufacturers can often redesign processes to reduce energy use. Some manufacturers use large amounts of energy in production. Due to the high cost of converting to energy-efficient systems, manufacturers are reluctant to approve such projects unless energy costs are projected to remain high.

"Green" Manufacturing Practices - In addition to investing in energy efficiency, manufacturers are also redesigning plants and processes to reduce emissions and the company's "carbon footprint." These green investments can provide an attractive return and allow the company to market a positive environmental message to customers and investors.

EXECUTIVE IDEAS…

Executive: CHIEF EXECUTIVE OFFICER - CEO

Key Focus: Competing with Low-Cost Imports

Imports of manufactured goods to the US have increased steadily, because products with a large labor content are much cheaper

to produce in low-cost countries like China and Mexico. US companies have automated production as much as possible to lower the labor content and have implemented lean manufacturing to reduce waste and costly inventories. US manufacturers keep complex manufacturing at home while offshoring some mass manufacturing and taking advantage of established brand names and distribution pipelines.

Key Focus: Moving Manufacturing Offshore
Any product with high labor content is susceptible to being manufactured more economically in a low-wage country. This is particularly true of small items that don't have high shipping costs, such as handtools, electronic products, textiles, etc. Many companies have adopted a strategy of either setting up manufacturing plants overseas or contracting with an overseas supplier to produce merchandise with their name.

Executive: CHIEF FINANCIAL OFFICER - CFO
Key Focus: Substituting Capital for Labor
Manufacturing domestically allows better management oversight and responsiveness to customers' evolving needs. To make domestic manufacture cost-competitive with low-cost imports, companies must minimize labor content by automating production. Manufacturing automation requires expensive networked intelligence systems and robotics. Factory automation is generally financed through long-term bank loans or capital placements.

Key Focus: Outsourcing Non-Core Functions
Outsourcing non-core functions allows management to increase operational efficiency by concentrating resources on primary production and marketing functions. Many companies are outsourcing services they previously did themselves, like parts manufacture, maintenance, computer and payroll services, and benefits management. As product life cycles have contracted, building proprietary assembly lines has become less practical. In the telecom industry, contract manufacturers have made it possible for companies to increase efficiency by leasing, rather than owning, equipment and employees.

Executive: CHIEF INFORMATION OFFICER - CIO
Key Focus: Supporting Lean Manufacturing
Lean manufacturing is a continuous process whereby all processes and operations are examined to eliminate (or minimize) waste: wasted feedstock; wasted motion; wasted product (below quality standards); wasted time (inventories, moving in-process materials, etc). Processes are defined, analyzed, and redesigned to be more efficient. Once implemented, processes are continually re-evaluated and refined to make them still more efficient. Information systems must be designed to be flexible to support process changes, provide the real time data required for lean manufacturing, and integrate with both suppliers and customers.

Key Focus: Applying Technology Innovatively
Investors and other equity holders demand better margins, more product innovation, and quicker time-to-market for new products. Manufacturers use technology to lower costs, improve products, and optimize supply chain performance. US industry spends almost 75 percent of R&D funds on product development, with 21 percent on applied research and 4 percent on basic science. The US manufacturing sector is evolving toward producing goods with either a high-tech component or that are fabricated with technologically advanced equipment. The auto industry is an example: electronic content is growing 6 percent per year and is predicted to reach 40 percent of vehicle cost by 2015, according to the Society of Automotive Engineers (SAE).

Executive: HUMAN RESOURCES - HR
Key Focus: Overseeing Personnel Needs During Outsourcing
Outsourcing has become a fact for most manufacturing companies. Factories can be sold to other manufacturing companies or companies can outsource non-core operations, such as accounting, payroll, benefits programs, IT, etc. Staff is generally part of the outsourcing process, either moving to the outsourcer or being laid off by the manufacturer. HR must evaluate the benefit status of each employee and assure that they're accommodated.

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Key Focus: Implementing Safety Training Programs
Many manufacturing jobs are semi-skilled and require expertise in operating specialized machinery. The safety record of manufacturing has steadily increased; by 2004 the annual rate of illness and injury per 100 workers was roughly comparable to the national average. To minimize company liability, HR must implement training programs for the safe and efficient operation and maintenance of all equipment, ensure that staff members attend training, and oversee training compliance.

Key Focus: Marketing Globally
Manufacturing has become global with plants established as needed, where needed. Lucent, for example, uses its North Carolina plant to build end-of-life cycle legacy systems; has its branded gear made in Brazil, because of import tariffs, for that market; opened a plant in Poland to handle late-life cycle products that fall under new EU recycling laws (RoHS); and relies on EMS plants in Romania and the Czech Republic to pick up the slack for Chinese plants closed during the Chinese New Year. As plants are located to accommodate local markets, marketing is taking advantage to increase regional sales.

INDUSTRY FORECAST
The output of the US manufacturing sector is forecast to grow at an annual compounded rate of 2 percent between 2008 and 2013. Data Sourced: December 2008
Manufacturing Production Growth Recovers After Dip

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