vertical IQ

US Manufacturing Sector

NAICS: 31-33
SIC: 20-39

prepared February 18th, 2022

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Coronavirus Update

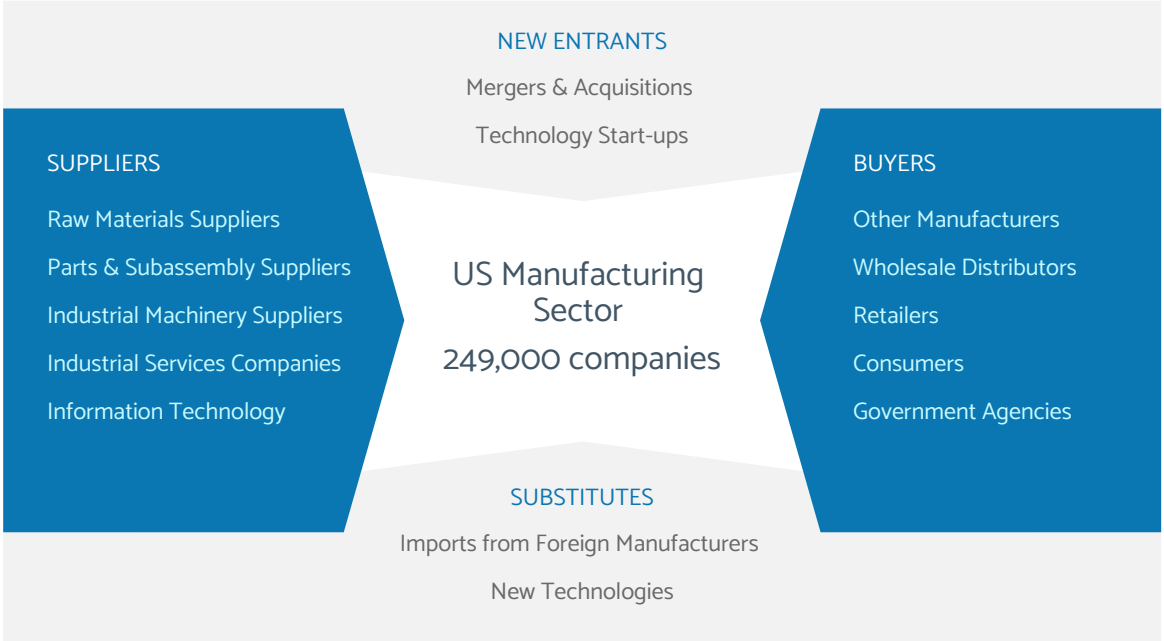
Jan 18, 2022 -- Omicron Variant Brings More Uncertainty for Supply Chains

- In December, the Institute for Supply Management's (ISM) Winter 2022 Semiannual Economic Forecast updated its outlook for US manufacturing. The ISM expects manufacturing sector revenue to moderate to 6.5% growth in 2022, after a 14.1% increase in 2021. Manufacturing revenue declined 1.3% during pandemic-plagued 2020. Revenue in 2022 is projected to rise in 15 of the 18 industry sectors tracked by ISM, led by apparel, leather & allied products; machinery; computer & electronic products; fabricated metal products; and transportation equipment. More than 80% of manufacturers report problems with hiring enough workers, and about 43% say they've increased wages to attract new employees and retain existing ones. About 70% of manufacturers expect supply chain conditions to be about the same or worse by the second quarter of 2022. Manufacturers expect inflation to moderate in 2022, and nearly two-thirds say they've passed higher costs on to customers.
- In early December, the Organization of Economic Co-Operation and Development (OECD) said the global economy continues to rebound but suggested the emergence of the Omicron variant of the coronavirus points to rising risks and imbalances in the recovery. The OECD expects global GDP to rise 5.6% in 2021, then moderate to 4.5% growth in 2022. However, the threat of continued COVID-19 outbreaks may magnify existing problems, including supply chain disruptions, labor and materials shortages, and inflation. The OECD said the Omicron variant highlights the need to speed up global vaccine rollouts to prevent the emergence of additional variants. Broader vaccination efforts may also help ease supply chain logjams by enabling a wider reopening of manufacturing facilities, ports, and borders.
- The pandemic has exposed the vulnerability of far-flung, complicated global supply chains. Supply chain diversification is expected to lead companies to move some activities out of China. Nearly 85% of procurement professionals at North American manufacturing firms are likely or extremely likely to reshore some of their supply chains, according to a June 2021 report released by Thomas, a provider of supplier and product sourcing services. A strong majority of survey respondents plan to reshore some operations despite some challenges in doing so, including price and speed. Thomas estimates that if manufacturers who say they plan to reshore some operations each bring on just one domestic supplier, it could drive nearly $455 billion in economic value.
- New orders for durable goods rose a seasonally adjusted 2.6% in November 2021 from October, according to the US Census Bureau. New orders were primarily driven by a 34% increase in nondefense aircraft and parts orders, which tend to be volatile. Excluding transportation, new orders increased by 0.8%. Businesses are likely to continue making capital investments to meet growing demand and supply chain challenges, but how Omicron could affect capital expenditures remains to be seen, according to Oxford Economics. Some industry watchers suggest that manufacturers will boost their investments in machinery and technology well into 2022 to help offset the difficulties in attracting enough workers.
- Some manufacturers are still struggling with a global semiconductor shortage that proved particularly troublesome for automakers. According to market research firm Gartner, the semiconductor shortage will linger into the second quarter of 2022. The CEO of Intel has said that while there is likely to be an improvement in 2022, the shortage could persist into 2023. Several chip firms have plans to expand their manufacturing capacity, but some industry insiders think it could be 2023 before much of the planned additional capacity comes online, according to CNBC.
- On September 9, the Biden Administration announced that businesses with more than 100 employees would have to require their workers to be vaccinated or be subject to at least weekly COVID-19 testing. The administration also issued orders requiring all federal workers and on-site government contractors to be vaccinated. The requirements were to be implemented through a temporary standard issued by the Labor Department's Occupational Safety and Health Administration (OSHA). On November 6, the 5th US Circuit Court of Appeals temporarily blocked the OHSA rule due to potential "grave statutory and constitutional issues." More than two dozen states, business groups, individual businesses, labor unions, and religious organizations sued to block the OSHA rule. Due to lawsuits in several circuit courts, federal law required them to be consolidated and heard in a single court chosen by lottery. In mid-November, the lottery was held, and the case was set to be heard in the Sixth US Circuit Court of Appeals. On December 17, the Sixth US Circuit Court of Appeals overturned the lower court's ruling, and some businesses immediately appealed the ruling to the Supreme Court. On January 13, the Supreme Court blocked the vaccine requirement for companies with 100 or more employees. Of about 246,000 manufacturing firms in the US, about 16,500 have more than 100 workers, according to the US Census Bureau.
- In January, a COVID-19 outbreak at the ports of Los Angeles and Long Beach again slowed the clearing of a logjam of

containerships waiting off the West Coast to unload, according to The Wall Street Journal. As of January 10, about 10% of the workforce at the LA and Long Beach ports was away from work due to COVID-19-related reasons, according to the Pacific Maritime Association. Fueled by the Omicron variant, port worker infections have risen sharply. More than 100 containerships were waiting off the coast on New Year's Day. Before the pandemic, it was unusual for more than one ship to wait for unloading. Omicron is also spreading in China, which has led to factory shut-downs and disruption of port operations, according to The Wall Street Journal. Logistics industry watchers are worried that China's zero-tolerance policy for containing the pandemic could trigger more significant disruptions throughout the world economy.

- As the Omicron variant drove new cases higher in early 2022, some manufacturers reported production slowdowns amid the uptick in workers calling in sick, according to The Wall Street Journal. Some industry watchers are worried the effects of Omicron-related absenteeism could affect suppliers and worsen existing transportation bottlenecks, which could push production costs higher.

Sector Structure



The average manufacturing firm employs about 51-52 workers and generates $24 million in annual revenue.

- The manufacturing sector consists of about 249,000 companies that employ over 12.8 million workers and generate $6 trillion in annual revenue.
- The manufacturing sector represents 16% of the nation's Gross Domestic Product (GDP) and employs 10% of the country's workers.
- About 69% of manufacturing establishments have fewer than 20 employees.
- The largest manufacturing subsectors in terms of revenue are transportation equipment (representing 17% of sector revenue), food products (13%), chemicals (13%), and petroleum and coal (11%).

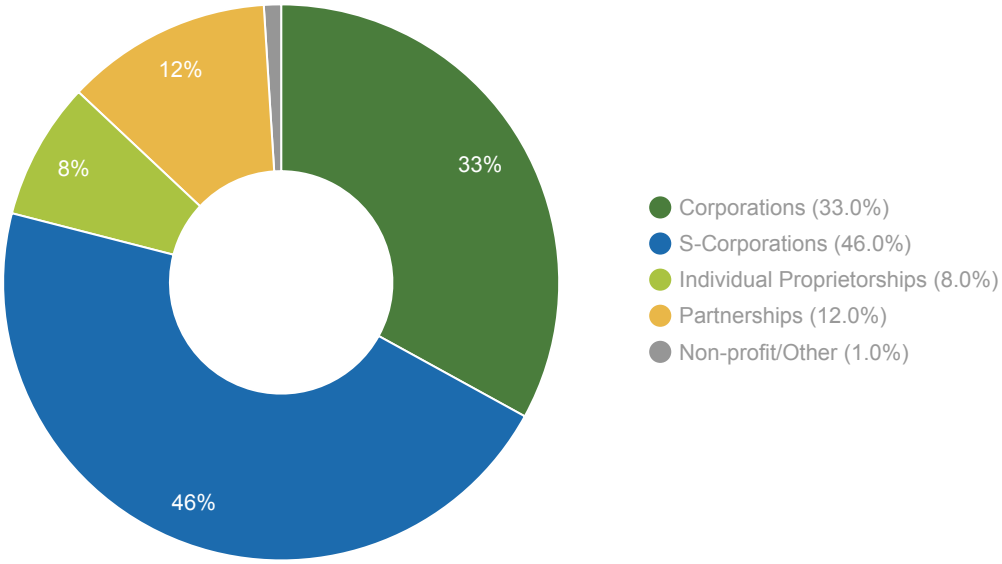
US Manufacturing Sector Subsectors

SUBSECTOR	NO. FIRMS	AVG. REVENUE PER FIRM ($K)	AVG. NO. OF EMPLOYEES / FIRM	AVG. REVENUE / EMPLOYEE ($K)
Food *(NAICS: 311)*	23,115	$33,565	65	$516
Beverage and Tobacco Products *(NAICS: 312)*	8,455	$18,332	25	$737
Textile Mills *(NAICS: 313)*	1,974	$15,705	53	$298
Textile Product Mills *(NAICS: 314)*	5,509	$4,125	19	$215
Apparel *(NAICS: 315)*	5,658	$1,811	15	$122
Leather Products *(NAICS: 316)*	1,124	$4,274	23	$185
Wood Products *(NAICS: 321)*	12,576	$8,525	31	$272
Total	*249,214*	*$22,283*	*46*	*$482*

SUBSECTOR	NO. FIRMS	AVG. REVENUE PER FIRM ($K)	AVG. NO. OF EMPLOYEES / FIRM	AVG. REVENUE / EMPLOYEE ($K)
Paper Products *(NAICS: 322)*	2517	$74,051	133	$559
Printing *(NAICS: 323)*	23,807	$3,476	18	$192
Petroleum and Coal Products *(NAICS: 324)*	941	$577,524	115	$5,035
Chemical Products *(NAICS: 325)*	9,839	$74,798	78	$963
Plastics and Rubber Products *(NAICS: 326)*	9,402	$25,167	80	$315
Nonmetallic Mineral Products *(NAICS: 327)*	9,385	$13,411	41	$325
Primary Metal Products *(NAICS: 331)*	3,036	$73,153	118	$618
Fabricated Metal Products *(NAICS: 332)*	50,317	$6,821	27	$251
Machinery *(NAICS: 333)*	20,611	$17,684	50	$354
Computer and Electronic Products *(NAICS: 334)*	10,775	$28,426	74	$382
Electrical Equip., Appliances and Components *(NAICS: 335)*	4,763	$25,814	73	$353
Transportation Equipment *(NAICS: 336)*	9,591	$99,236	159	$623
Furniture Products *(NAICS: 337)*	13,935	$5,391	27	$202
Miscellaneous Products *(NAICS: 339)*	26,573	$5,585	20	$283
Total	*249,214*	*$22,283*	*46*	*$482*

Source: Census Bureau

Industry Demographics



Source: US Census Bureau

Female Owned

14.0%

Minority Owned

11.0%

Veteran Owned

10.2%

Source: Census Bureau

Geographic Breakdown

STATE	NO. ESTABLISHMENTS	% OF TOTAL US ESTABLISHMENTS	NET CHANGE 2018	% CHANGE
Alabama	3968	1.4%	1	0.0%
Alaska	478	0.2%	16	3.3%
Arizona	4060	1.5%	35	0.9%
Arkansas	2458	0.9%	-1	0.0%
California	34942	12.8%	-261	-0.7%
Colorado	4718	1.7%	41	0.9%
Connecticut	3781	1.4%	-48	-1.3%
Delaware	532	0.2%	19	3.6%
Florida	12461	4.5%	40	0.3%
Georgia	7208	2.6%	49	0.7%
Hawaii	727	0.3%	10	1.4%
Idaho	1734	0.6%	20	1.2%
Illinois	12404	4.5%	-110	-0.9%
Indiana	7689	2.8%	-18	-0.2%
Iowa	3351	1.2%	27	0.8%
Kansas	2629	1.0%	-17	-0.6%
Kentucky	3535	1.3%	-14	-0.4%
Louisiana	3023	1.1%	-12	-0.4%
Maine	1539	0.6%	-9	-0.6%
Maryland	2745	1.0%	-17	-0.6%
Massachusetts	6105	2.2%	-44	-0.7%
Michigan	11775	4.3%	13	0.1%
Minnesota	6663	2.4%	-50	-0.8%
Mississippi	2029	0.7%	-38	-1.9%
Missouri	5411	2.0%	-84	-1.6%
Montana	1220	0.4%	36	3.0%
Nebraska	1671	0.6%	-19	-1.1%
Nevada	1690	0.6%	21	1.2%

STATE	NO. ESTABLISHMENTS	% OF TOTAL US ESTABLISHMENTS	NET CHANGE 2018	% CHANGE
New Hampshire	1723	0.6%	1	0.1%
New Jersey	6894	2.5%	-37	-0.5%
New Mexico	1215	0.4%	-16	-1.3%
New York	14184	5.2%	-226	-1.6%
North Carolina	8298	3.0%	-34	-0.4%
North Dakota	659	0.2%	6	0.9%
Ohio	13358	4.9%	-16	-0.1%
Oklahoma	3204	1.2%	22	0.7%
Oregon	5134	1.9%	-9	-0.2%
Pennsylvania	12918	4.7%	-52	-0.4%
Rhode Island	1234	0.5%	-32	-2.6%
South Carolina	3675	1.3%	31	0.8%
South Dakota	970	0.4%	-11	-1.1%
Tennessee	5501	2.0%	-8	-0.1%
Texas	18979	6.9%	253	1.3%
Utah	3160	1.2%	37	1.2%
Vermont	969	0.4%	11	1.1%
Virginia	4755	1.7%	18	0.4%
Washington	6493	2.4%	-31	-0.5%
West Virginia	1072	0.4%	-25	-2.3%
Wisconsin	8393	3.1%	-44	-0.5%
Wyoming	515	0.2%	8	1.6%

Source: Census Bureau

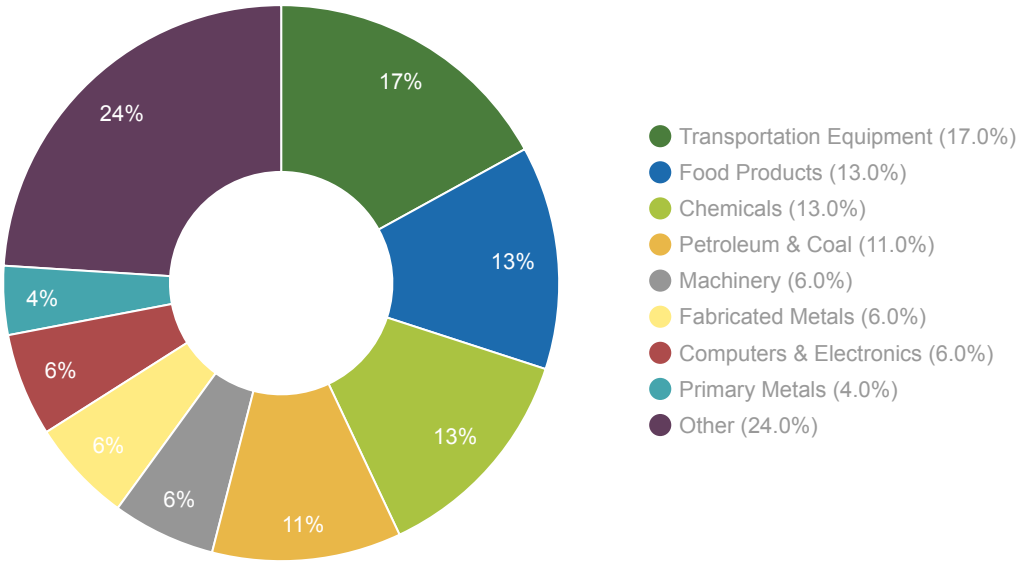
How the Sector Operates

Products and Operations

Manufacturers produce two classifications of goods: durable and nondurable. Goods are deemed durable if they are generally made to last three or more years. Durable goods include wood products, metal products, machinery, computers, furniture, and vehicles. Nondurable goods are quickly consumed or frequently replaced items such as food and beverages, textiles and apparel, petroleum products (gasoline), chemicals and pharmaceuticals, paper products, and plastics.

- The value of manufacturers' shipments is split evenly between durable and nondurable goods.
- The largest durable goods segments are transportation equipment (35%), fabricated metals (13% of sales), machinery (13%), and computers and electronic products (11%).
- The largest nondurable goods segments are food (26% of sales), chemicals (27%), (petroleum refining (22%) and plastics and rubber products (8%).

US Manufacturing Revenue



Source: US Census Bureau

The manufacturing process generally includes the inflow and storage of raw materials, production of goods, quality testing, storage of finished inventory, picking and packing for shipment, and outflow of orders to customers. Products may be built to the manufacturers' specifications, also known as stock production, or designed to customers' specifications. The production of goods can range from small batches of 1-2 units to large production runs of thousands or millions of units. The ability to quickly calibrate or reconfigure machinery and move from order to order is key to productivity and meeting tight order deadlines. Downtime for machinery reconfiguration or maintenance slows order completion.

Just-in-time (JIT) is the production strategy of ordering inventory and manufacturing goods to fill existing or anticipated orders. JIT allows manufacturers to minimize storage space due to less inventory, closely control expenses, and reduce the risk of obsolete or damaged inventory in storage. However, the JIT strategy requires manufacturers to have multiple or steady suppliers that can reliably and quickly supply materials, and the ability to foresee spikes in demand for their products so customer orders are reliably filled.

Many US manufacturers operate production facilities abroad to take advantage of lower cost labor, materials and energy. US manufacturers may produce all or part of their products overseas and ship the inventory back to the US for final or value-added processing, packaging and shipping.

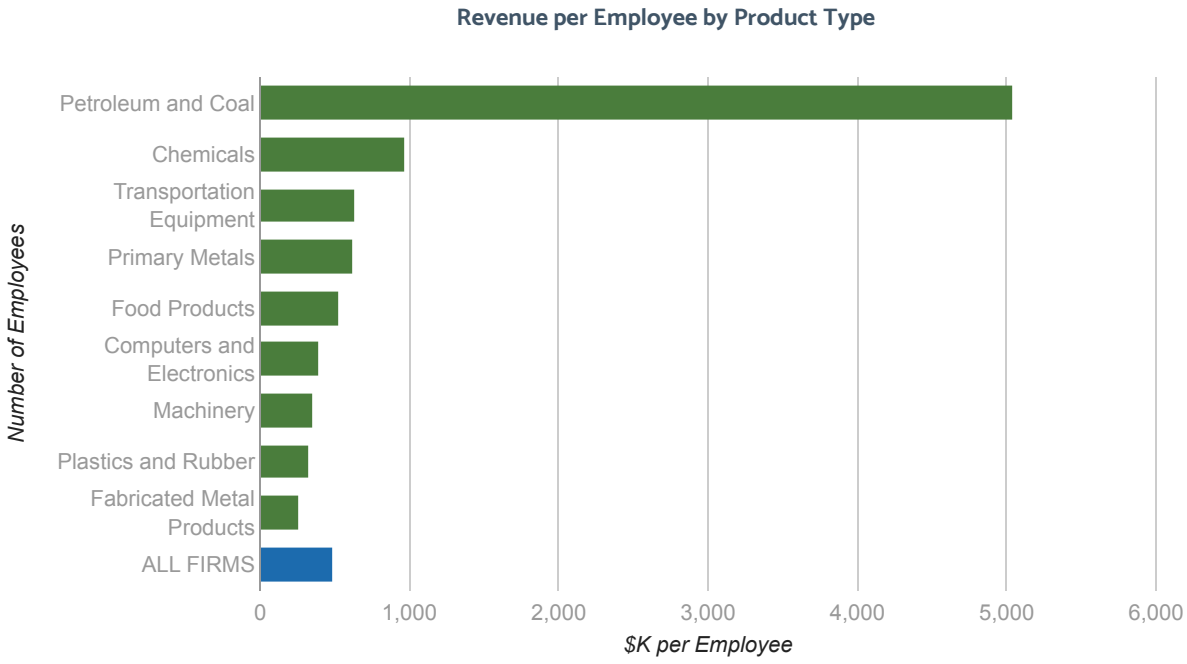
Manufacturers may also provide services such as design and engineering, prototype development, product assembly, and packaging for inventors, product developers, and other manufacturers. Known as contract manufacturers, these firms compete for outsourcing contracts by submitting a production bid to the client. Once a contract is agreed to, the contract manufacturer acts as the client's production and shipping facility.

Manufacturing facilities typically operate in 8-hour shifts. Facilities may operate 24-hours per day with production divided into three, 8-hour shifts.

Employment levels vary greatly across the manufacturing sector depending on the complexity of production, average size of operations, and automation. Labor intensity is low for manufacturers that average fewer than 30 workers per firm, including commercial printers and manufacturers of beverages and tobacco products, textiles, apparel, leather, wood products, fabricated metals, and furniture. Labor intensity is high (over 100 workers per firm) for manufacturers of paper, primary metals, petroleum and coal, and transportation equipment.

The average production worker earns about $39,000 per year, but wages vary depending on skill level and range from $27,000 to $63,000 per year. The average production employee works 40-41 hours per week. Typical labor turnover is about 2-3% of workers annually. Manufacturers may hire contract workers from employment agencies to reduce the costs of insurance and benefits, ramp up production, or temporarily fill open positions until a permanent employee is hired.

About 12-13% of manufacturing sector workers are unionized. Firms periodically negotiate with union representatives regarding workers' wages, benefits, and working conditions. As a result, manufacturers may experience labor strikes that slow or halt production and create negative PR.



Source: US Census Bureau

Profit Drivers

Achieving High Capacity Utilization

Fully utilizing available production capacity allows manufacturers to spread fixed overhead costs across more units, improving profitability. Effective marketing and sales programs help firms build an order backlog that makes it easier to efficiently schedule production and optimize capacity utilization. Versatile production equipment can help minimize changeover times between different products, increasing production capacity.

Efficiently Managing Inventory

Manufacturers must balance carrying sufficient raw material and finished goods inventory to respond to customer demand with avoiding higher inventory carrying costs. Many firms work closely with suppliers to implement just-in-time production techniques that minimize inventory levels. Nearly all use inventory management systems, usually integrated as part of an Enterprise Resource Planning (ERP) system, to track inventory and schedule orders of additional raw materials.

Improving Labor Productivity

Labor can be a significant production cost for manufacturers, which has driven many to open plants in lower-wage countries. By increasing labor productivity, firms can make domestic manufacturing plants more competitive and improve profit margins. They invest in machinery and automation to reduce the amount of labor required to produce units. Implementing design for manufacturability (DFM) techniques can help in automating repetitive tasks and can also make manual processes more productive.

Technology Investment

Manufacturers use advances in technology to track inventory, optimize operations, minimize waste, lower production costs, increase productivity and speed production. The expanding use of machinery married with technology and software is launching the manufacturing sector into the 4th Industrial Revolution. Technology used in the manufacturing sector includes robotics, 3D printing, machine technology, process automation, IIoT, and onsite energy production and storage. As the sector adopts more advanced technology, the need for highly-educated and technically-skilled workers is growing as the need for low-skilled workers is shrinking. Technology in manufacturing is driven by the need for cost reduction, waste minimization, sustainability, competitive advantage, high volume customization, faster order fulfillment, and safety.

Process Automation

Process automation allows manufacturers to control a broad range of operations using production management software. Firms use process automation to control machinery and robots performing repetitive manufacturing tasks such as stamping, welding, filling, assembly, inspection and sealing. Manufacturers also use process automation in inventory management, production planning and analysis, sales order processing, materials procurement, and quality control.

Robotics

Industrial robots are used to perform repetitive, dangerous or high-precision tasks or processes. Robotic arms are typically used in place of humans and isolated or placed behind barriers to prevent workers from getting too close and being injured. Collaborative robots (cobots) assist human workers without the need for barriers. Cobots are typically equipped with sensors and software to detect human movement and obstacles in their space and stop moving to avoid contact. As production robots become more mainstream, prices are falling and used models are in the market, allowing smaller manufacturers to invest in the technology and improve operations.

3D Printing

In 3D printing, a digital blueprint is designed with computer software and sent to a machine that applies layers of material (typically metal, plastic or rubber) upon layers to produce a physical, three-dimensional object. This process is called additive manufacturing since layer of material are added to one other to create a physical product. 3D printers come in a wide variety of sizes and are capable of producing basic shapes as well as complex finished products. Firms use 3D printers to manufacture whole products, components, machine tools, and replacement parts. High volume customization can be achieved by tweaking the digital blueprints of the 3D design.

Machine Technology

Computerized machinery allows a worker to operate a machine remotely or through a control panel on the machine. The onboard computer is connected physically or wirelessly to a command station away from the moving parts of the machine or other hazards. The worker uses the station or panel to manipulate a software program or controls to start, stop, alter speed, and control operating parameters (pressure, temperature, flow). Because computerized machinery is operated at a distance from hazards, the risk of injury is reduced. Often a single operator can control many computerized processes, allowing for greater productivity and less labor. An example of computerized machinery is CNC, or computer numerical control, milling machines. These machines use high powered water jets or lasers to remove material from a slab, sheet or block of rigid material, generally metal, plastic, stone or rubber. This process is called subtractive manufacturing because material is removed to produce an object. Like 3D printing, a digital blueprint is designed with computer software and sent to the CNC machine for material processing.

Industrial Internet of Things (IIoT)

IIoT is the use of sensors and machinery connected to computers and software to collect data and improve processes and safety. This connectivity allows manufacturers to analyze how machinery is operating, increase precision and efficiency, and predict maintenance needs. The greater understanding of how machines are operating and contributing to production flow allows for flexibility, less

downtime, fewer bottlenecks, better utilization of machinery, and potentially longer machine life.

Onsite Energy Production

Many manufacturers use backup generators for critical equipment, but some are installing solar panels and battery banks on production facility roofs and grounds to generate and store electricity and reduce reliance on public utilities. The manufacturing sector uses about 800 billion kilowatt hours of electricity per year, or almost one-third of the nation's energy consumption. Energy costs and supply are impacted by changes in regional consumption, terrorism, grid failure or blackouts, and weather damage to energy infrastructure. Onsite energy production reduces the risks associated with loss of grid power or surges that can damage equipment and facilities, injure workers, ruin cold or frozen inventory, halt production and create backlogs.

Percent of US Manufacturing Sector firms investing in technology

AI	Cloud	Specialized Software	Robotics	Specialized Equipment
3.0%	29.1%	41.9%	9.6%	39.3%

Source: Census Bureau

Global Perspective

Global Market Size

The onset of the COVID-19 pandemic had an immediate effect on global manufacturing output as containment efforts curtailed production, reduced demand, and disrupted supply chains. In the second quarter of 2020, global manufacturing output declined 11.2% compared to the same period in 2019, according to the United Nations Industrial Development Organization (UNIDO). Output of value-added manufactured goods fell in every region except China which saw a 2.8% increase. Of 23 specific manufacturing subsectors, only two experienced growth in the second quarter of 2020: basic pharmaceutical products; and computer, electronic, and optical products. Fifteen subsectors experienced double-digit declines. Global manufacturing activity has gradually improved. As of mid-2021, the J.P. Morgan Global Manufacturing PMI index was firmly in expansion territory as production, employment, new orders, and business optimism were all on the rise. However, supply chain disruptions remain a persistent issue and are causing production and delivery delays for manufacturers.

Large Companies

COMPANY	HOME COUNTRY
Apple	US
China Railway Group	China
Daimler	Germany
General Electric	US
Hon Hai Technology Group (Foxconn)	Taiwan
Huawei	China
Samsung Electronics	South Korea
Siemens	Germany
Toyota Group	Japan
Volkswagen Group	Germany

Key Global Trends

Global Manufacturing Sector Recovering – Despite pandemic-related challenges to supply chains and production disruptions, global manufacturing has been on the mend since mid-2020 as consumer demand for manufactured goods has increased. The Conference Board projects global GDP will rise 5.3% in 2021 and 2% in 2022. However, the recovery is likely to be led by mature economies as some emerging markets – including Latin America and sub-Saharan Africa - face longer comebacks. Amid a successful vaccine rollout and government stimulus, US GDP is set to grow 6.6% in 2021. While the EU's vaccine efforts stumbled early on, distribution has improved along with business and consumer confidence. The EU's GDP is expected to rise 4.4% in 2021. China's GDP is forecast to increase 8.6% in 2020. Key drivers in China include sizable investments in infrastructure projects and progress on emphasizing its high-tech manufacturing sector.

Industrial IoT – The industrial internet-of-things (IIoT) is projected to be the next industrial revolution in terms of its impact on production efficiency. IoT-enabled machinery uses sensors to gather data and leverages artificial intelligence and machine learning to perform predictive analytics to prevent unplanned downtime before it occurs. The global IIoT platform market was valued at $13.7 billion in 2020 and is expected to see average annual growth of nearly 15% through 2026, according to MarketsandMarkets. Due to an early embrace and adoption of IIoT, North America is the largest regional market, but Asia Pacific is expected to be the fastest-growing.

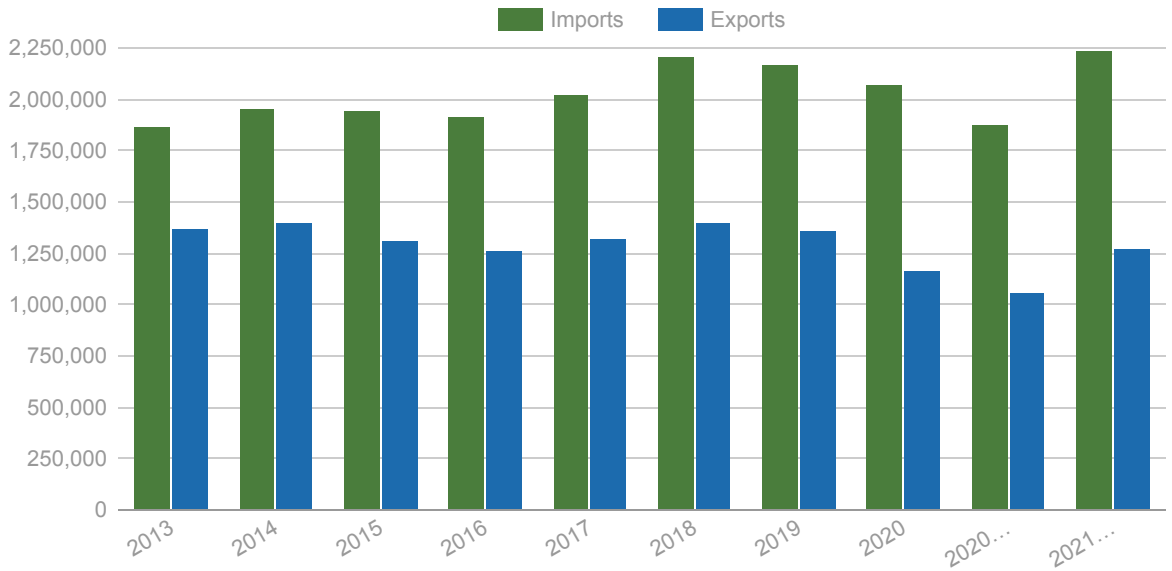
Next generation – or 5G – wireless networks are a key technology for enabling the smart factories of the future. The US, China, South Korea, and the EU are home to the major producers of 5G equipment and software. Trade tensions between the US and China – as well as cyber security concerns about China's technology - has complicated the rollout of 5G networks.

Reimagining Globalization – Supply chain disruptions stemming from the COVID-19 pandemic are prompting some manufacturers to modify their global production footprints and supplier networks. While manufacturers have long sought to situate production locations nearer to end markets, supply chain weaknesses exposed by the pandemic are expected to accelerate the trend. Suppliers to tier 1 and tier 2 manufacturers can create competitive advantages by being situated nearer to their customers' production sites – a strategy that is both global and local. Some US and European manufacturers are considering repatriating some production from China. Key drivers are an effort to reduce the risks of long supply chains and rising wages in China. The US government is expected to incentivize domestic production of key strategic technologies, including electric vehicle inputs and clean energy. The EU is aiming to increase regional semiconductor production and reduce reliance on foreign manufacturers. China is shifting its focus away from a dependence on exports for growth and instead encouraging domestic consumption.

Commodity Price Concerns – Global manufacturing activity plummeted at the onset of the pandemic amid falling demand and production shutdowns to prevent the spread of the virus. As consumers spent more time at home, consumption quickly rebounded. However, manufacturers' troubles with ramping back up quickly amid rising demand led to shortages which have driven prices for many raw materials higher, including metals, lumber, agricultural products, and oil and gas. If higher commodities costs linger, triggering higher producer and consumer prices and persistent inflation, consumers and businesses could pull back on consumption which could lead to a dip in manufacturing activity and global trade. However, some analysts suggest that the unevenness of the global recovery – where the US and China lead while the EU, Japan, Brazil, and the UK rebound more slowly - may temper widespread commodities demand and lessen the likelihood of long-term inflation.

International Trade

US Manufacturing Sector Imports and Exports

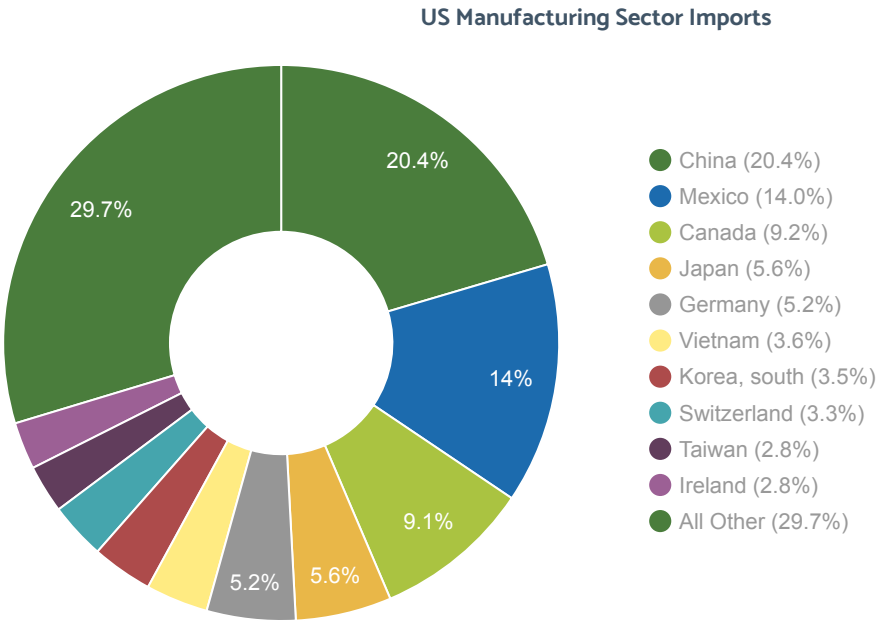


$ Millions

US Manufacturing Sector Year-to-Date Trade Data

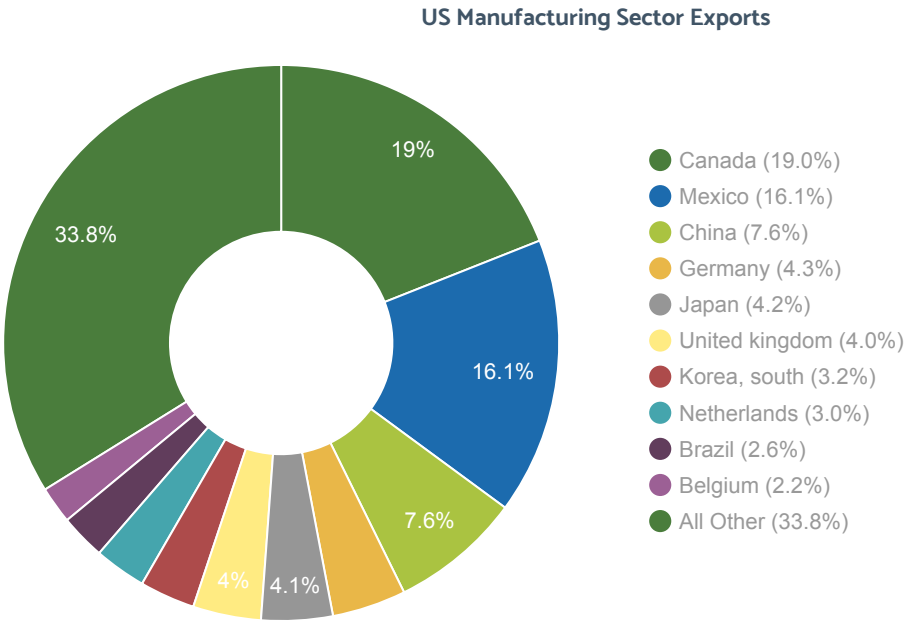
NOVEMBER 2021	VALUE ($MILLIONS)	% CHANGE
Imports	$2,237,882	16.0%
Exports	$1,272,745	16.44%
Trade Balance	-$965,137	

Imports by Country



COUNTRY	YEAR 2020	% IMPORTS
China	$423,349,348,886	20.43%
Mexico	$290,168,075,426	14.0%
Canada	$189,652,777,455	9.15%
Japan	$115,546,413,230	5.58%
Germany	$106,972,112,876	5.16%
Vietnam	$75,289,771,979	3.63%
Korea, south	$73,312,055,319	3.54%
Switzerland	$68,248,845,814	3.29%
Taiwan	$57,955,284,809	2.8%
Ireland	$56,904,887,556	2.75%
All Other	-	29.67%

Exports by Country



COUNTRY	YEAR 2020	% EXPORTS
Canada	$221,906,345,050	19.0%
Mexico	$187,924,849,235	16.09%
China	$88,971,697,691	7.62%
Germany	$50,198,767,474	4.3%
Japan	$48,516,033,039	4.15%
United kingdom	$46,277,453,536	3.96%
Korea, south	$37,672,204,970	3.22%
Netherlands	$35,249,565,443	3.02%
Brazil	$30,844,794,079	2.64%
Belgium	$25,220,025,546	2.16%
All Other	-	33.84%

Sector Trends

Trends are affected by the COVID-19 pandemic.

Changes in revenue, employment, business practices, trade and forecasts are occurring rapidly and data reporting by the government lags the changes. We are tracking changes in the "Coronavirus Update" chapter for those industries most affected and on our Covid-19 Updates Webpage.

Sales Growth Varies By Product

Manufacturing industry shipments overall fell 3% in 2016, rose 4.4% in 2017, 6.7% in 2018 and 0.9% in 2019 and then declined 5.6% in 2020. In 2020, the largest gains in shipment value were experienced by manufacturers of computer storage devices (29.2%), pharmaceuticals and medicines (11%), electronic components (10.4%), nondefense communications equipment (12.4%), and defense communications (7.1%). The largest losses were felt by manufacturers of nondefense aircraft and parts (-47.4%), petroleum refineries (-32%), automobiles (-27.8%), mining and extraction machinery (-18.6%) and ferrous metal foundries (-17.9%).

Stable Exports

Exports are a significant source of revenue for many manufacturers. Major export markets include Canada, Mexico, China, the UK, Germany, and Japan. After reaching a high of $1.4 trillion in 2014, manufactured goods exports fell 6.2% in 2015 and 4% in 2016. Exports rose 4.7% in 2017 and 5.7% in 2018 to just under $1.4 trillion, before falling 2.5% in 2019 and 14.2% in 2020 to just under $1.2 trillion. The 10-year average is just over $1.3 trillion.

Manufacturers Offer Services

Manufacturers may offer services such as product design and customization to add value to products and better meet customers' needs. Manufacturers may also contract with outside product designers and inventors to help them develop prototypes and eventually manufacture their products as an outsourced service to the designer or inventor. Contract manufacturing is especially prevalent in pharmaceuticals, medical devices, and electronics. Through the design for manufacturing (DFM) method, manufacturers collaborate with designers and inventors and provide insight into how to design a product to make it easier or more cost effective to manufacture.

Optimizing Productivity

Manufacturers strive to maximize production output from their inputs of raw materials, labor, and energy. Advances in machine technology, process automation, production materials, and inventory tracking help manufacturers optimize operations, minimize waste, and increase productivity. Manufacturing facilities are also incorporating robotics, 3D printing, and onsite energy production as these technologies develop and their applications expand.

Made In The USA

The push to bring manufacturing operations back to the US resulted in the "Made in America" slogan, which invokes a sense of quality and pride in goods made domestically. About 95% of Americans have a favorable view of US-made products according to the American Manufacturing Association, and over 90% of voters favor policies that direct government agencies to buy American-made products.

Foreign Direct Investment Expands

US manufacturers are experiencing an increase in interest from foreign investors. Foreign direct investment (FDI) in the manufacturing sector was $290 billion in 2015, $128 billion in 2016, $106 billion in 2017, $202 billion in 2018 and $78 billion in 2019. The manufacturing sector accounted for 63% of total FDI in the US in 2015, 33% in 2016, 39% in 2017, 65% in 2018 and 40% in 2019. Manufacturing subsectors with strong FDI include chemicals, machinery, pharmaceuticals, and food products.

Sector Challenges

Global Competition Intensifies

US manufacturers compete for market share domestically and internationally with producers in other nations. China has emerged as the largest production nation in the world, followed by the US. The US share of global manufacturing is around 16-17%, down from about 25% in 2004. During that same period, China's share jumped from about 8% to over 28%. Lower operating costs have driven production from the US to developing nations.

Costly Energy Consumption

Manufacturers suffer higher operating costs when the price of electricity rises or availability shrinks. The manufacturing sector uses about 800 billion kilowatt hours of electricity per year, or almost one-third of the nation's energy consumption. Energy costs and supply are impacted by changes in regional consumption, terrorism, grid failure or blackouts, and weather damage to energy infrastructure. Loss of power or surges can damage equipment and facilities, injure workers, ruin cold or frozen inventory, halt production and create backlogs. Many manufacturers use backup generators for critical equipment, and some are installing solar panels and battery banks on production facility roofs and grounds to generate and store electricity and reduce reliance on public utilities.

Worker Injury Rate Worsens

Manufacturing facilities are filled with machinery, equipment, vehicles, chemicals, liquids, and byproducts of production including fumes, dust, extreme temperature, and particulates in the air that can cause harm to workers. About 320-350 manufacturing sector workers are killed annually on the job. Injuries and fatalities typically occur from contact with machinery, slip and falls, and items falling on workers. Class-action lawsuits have stemmed from unprotected workers inhaling toxic fumes or particulates, resulting in long-term health issues and premature death. Manufacturers are required to follow OSHA regulations regarding worker protection and safety, are subject to inspections, and may incur fines or be exposed to legal action when safety requirements are not met.

Foreign Trade and Relations Scrutinized

Manufacturers are subject to trade restrictions, regulations and demand from foreign countries than can be politically and economically influenced. In the past decade, exports of manufactured goods have risen as much as 16% in a single year and fallen by as much as 6%. Components of trade agreements, like the United States-Mexico-Canada Agreement (USMCA) are regularly disputed and revised. In addition, disease outbreaks in livestock, genetic modification to crops, and pest infestations in forests have become points of contention and negatively impacted demand for US-made foods and wood products outside of the country. US manufacturers that produce goods in other nations are subject to those countries' trade, labor and manufacturing regulations and standards.

Recouping R&D Costs

Original equipment manufacturers (OEM) and brand-producers compete for market share with aftermarket, similar, or generic products that are often lower-priced. OEM and brand producers tend to have significant R&D and regulatory expense to recover and they do so by charging a premium for their products. Once patent protection ends or competitors with similar or superior products enter the market, OEMs and brand producers may experience slower sales and be forced to lower prices to better compete. R&D spending is greatest among manufacturers of pharmaceuticals, aerospace products, chemicals, computers, electronics, and motor vehicles and parts.

Environmental Regulation Tightens

Manufacturers are required to meet environmental regulations to protect air, water, and soil. The Environmental Protection Agency (EPA) oversees the manufacturing sector regarding pollution and contamination. Failure to meet regulations can result in fines, increased monitoring, plant shutdown, litigation, negative PR, and loss of customers. When water sources are contaminated, health risks rise for humans and wildlife. To mitigate air pollution, manufacturers install scrubbing technology to filter emissions and may purchase carbon credits, which are limited in number, monitored by the government, and purchased or traded among producers.

Skills Gap Widens

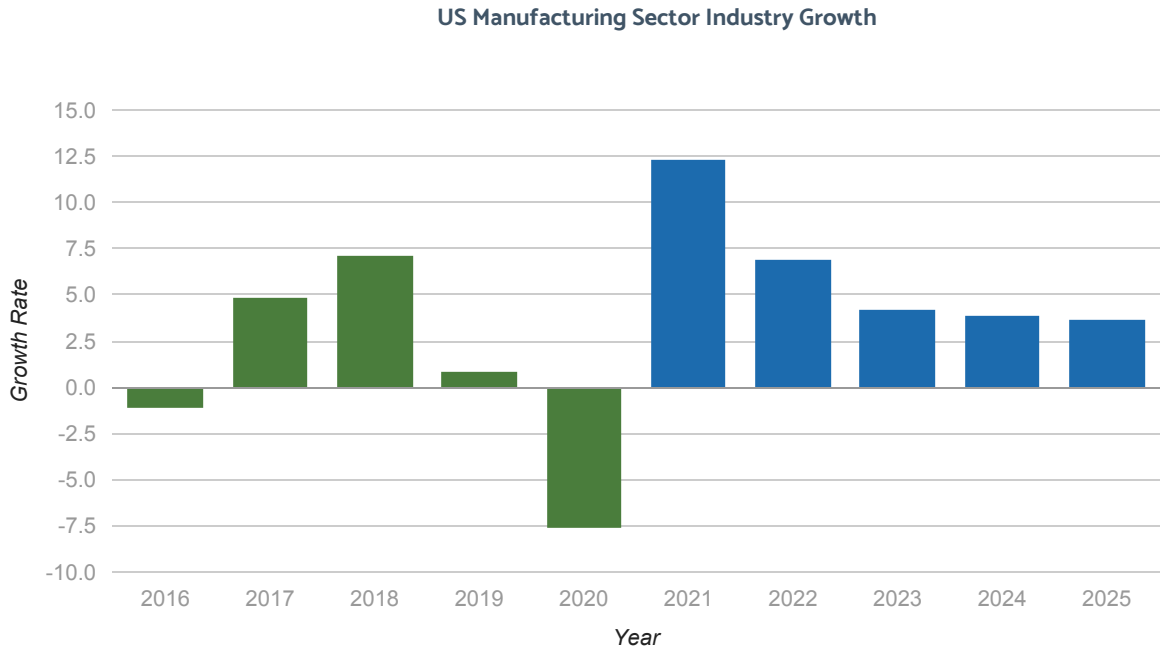
As manufacturing advances technologically, demand for skilled workers is rising. However, the industry is expected to struggle to fill jobs over the next decade. Factors include fewer youth seeking employment in the manufacturing sector, a lack of STEM (science, technology, engineering and math) and technical education programs that prepare students for employment in manufacturing, and massive retiring of the sector's experienced workers. The manufacturing sector is forecast to create about 3.5 million new manufacturing jobs through 2025, but as many as 2 million may go unfilled due to lack of skilled labor. The shortage could impact manufacturers' ability to expand and the addition of advanced technology into operations.

Sector Forecast

Sales for the US manufacturing industry are forecast to grow at a 6.09% compounded annual rate from 2020 to 2025, comparable to the growth of the overall economy.

Vertical IQ forecasts are based on the Inforum inter-industry economic model of the US economy. Inforum forecasts were prepared by the Interindustry Economic Research Fund, Inc.

Last Update: August 2021



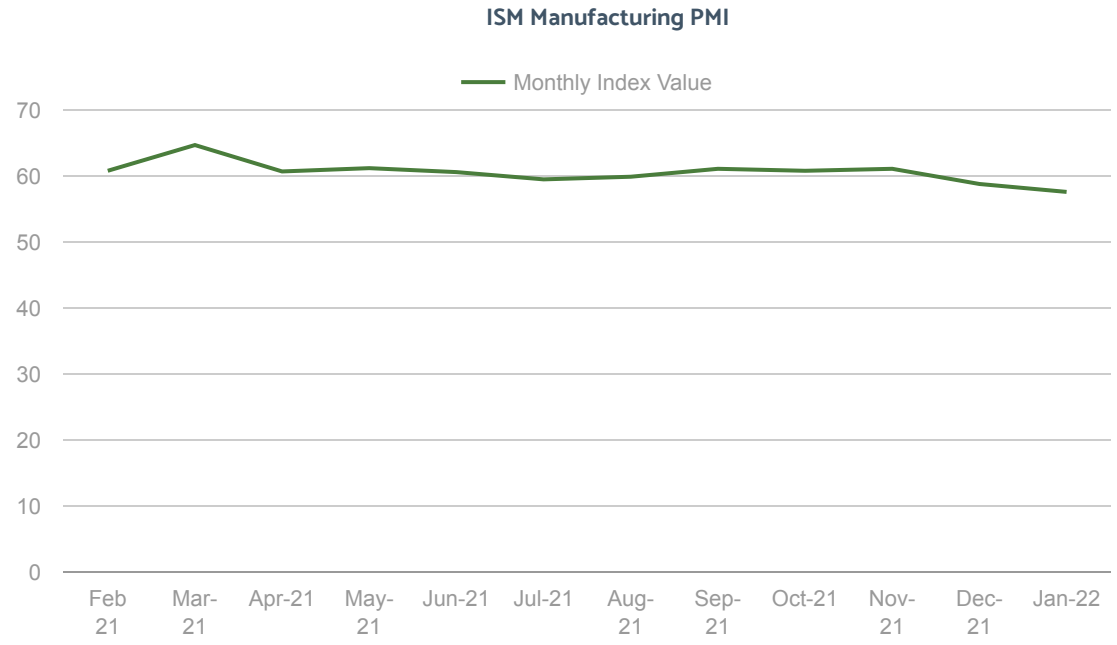
Source: Interindustry Economic Research Fund, Inc.

Sector Indicators and Drivers

ISM Manufacturing PMI

The January Manufacturing PMI® registered 57.6 percent, a decrease of 1.2 percentage points from the seasonally adjusted December reading of 58.8 percent. This figure indicates expansion in the overall economy for the 20th month in a row after a contraction in April and May 2020.

The 14 manufacturing industries reporting growth in January – in the following order – are: Apparel, Leather & Allied Products; Furniture & Related Products; Miscellaneous Manufacturing; Nonmetallic Mineral Products; Machinery; Electrical Equipment, Appliances & Components; Food, Beverage & Tobacco Products; Transportation Equipment; Primary Metals; Fabricated Metal Products; Computer & Electronic Products; Chemical Products; Petroleum & Coal Products; and Plastics & Rubber Products. The only industry reporting a decrease in January compared to December is Paper Products.



Source: ISM

The ISM Manufacturing PMI is based on data compiled monthly from purchasing and supply executives nationwide by the Institute for Supply Management. Diffusion indexes have the properties of leading indicators and are convenient summary measures showing the prevailing direction of change and the scope of change. A Manufacturing PMI® reading above 50 percent indicates that the manufacturing economy is generally expanding; below 50 percent indicates that it is generally declining.

Order Trends

Seasonally-adjusted new orders for manufactured goods rose from a year ago

Seasonally-adjusted new orders for manufactured goods were $531.8 billion in November 2021, a 15.51% change compared to a year ago and a 1.61% change from the previous month, according to the latest data from the Census Bureau.

Source: Census Bureau

Seasonally-adjusted new orders for durable goods rose from a year ago

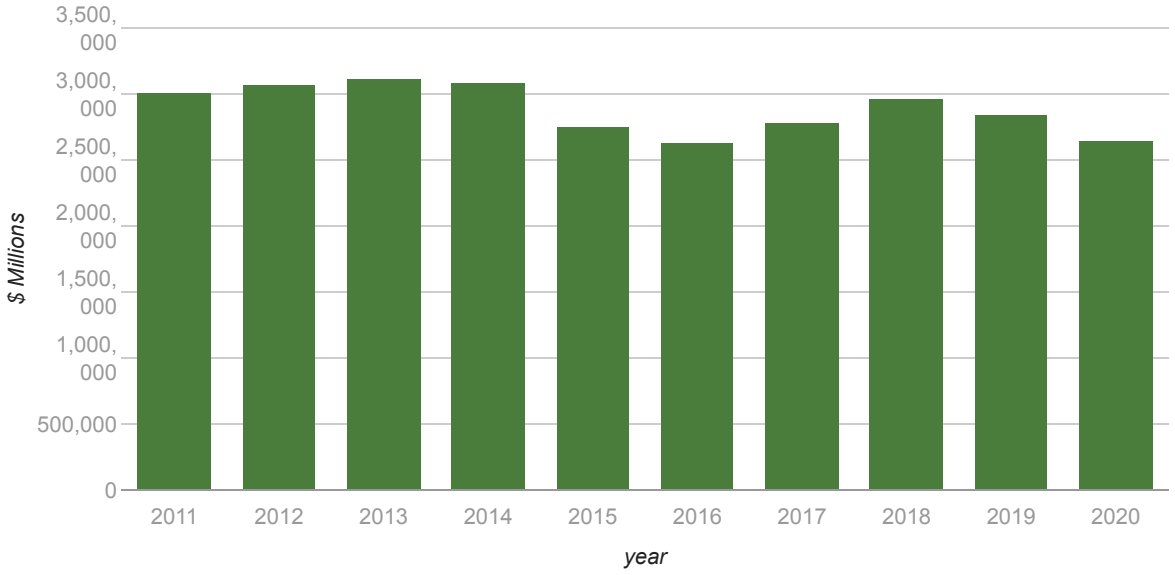
Seasonally-adjusted new orders for durable goods were $268.4 billion in November 2021, a 14.79% change compared to a year ago and a 2.56% change from the previous month, according to the latest data from the Census Bureau.

Source: Census Bureau

Seasonally-adjusted new orders for nondurable goods rose from a year ago

Seasonally-adjusted new orders for nondurable goods were $263.4 billion in November 2021, a 16.25% change compared to a year ago and a 0.65% change from the previous month, according to the latest data from the Census Bureau.

New Nondurable Goods Orders



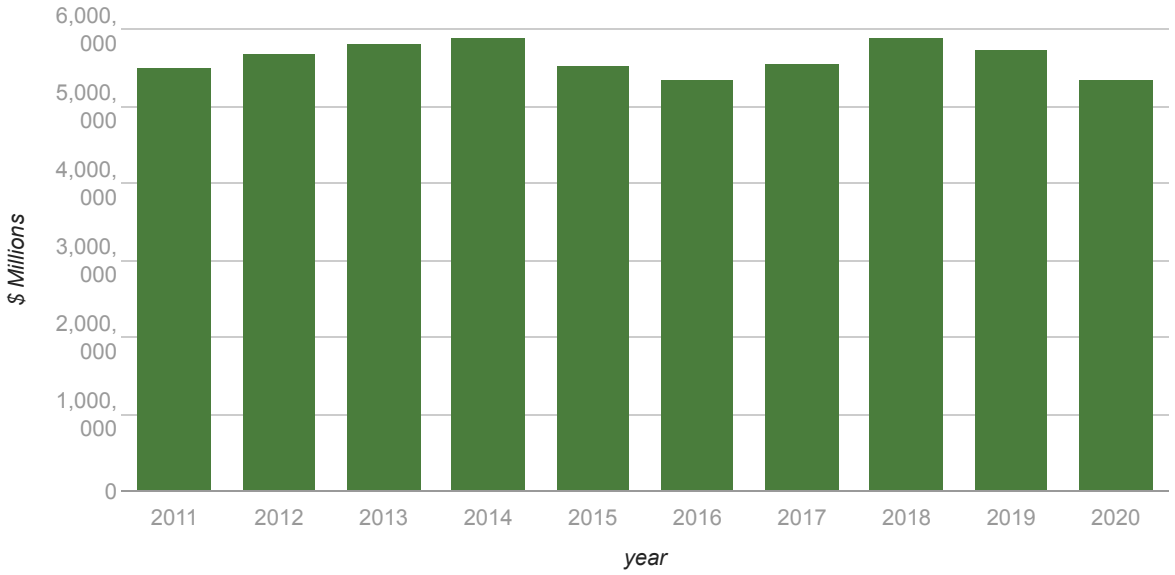
Source: Census Bureau

Shipment Trends

Seasonally-adjusted shipments of manufactured goods rose from a year ago

Seasonally-adjusted shipments of manufactured goods were $527.0 billion in November 2021, a 13% change compared to a year ago and a 0.67% change from the previous month, according to the latest data from the Census Bureau.

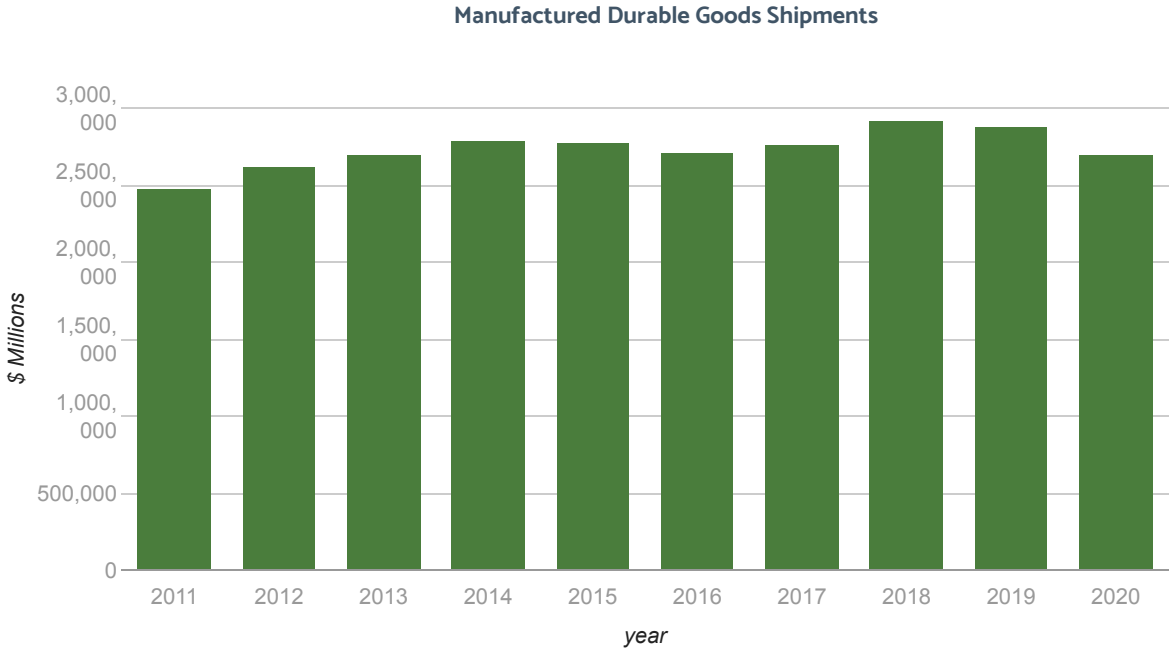
Manufactured Goods Shipments



Source: Census Bureau

Seasonally-adjusted shipments of manufactured durable goods rose from a year ago

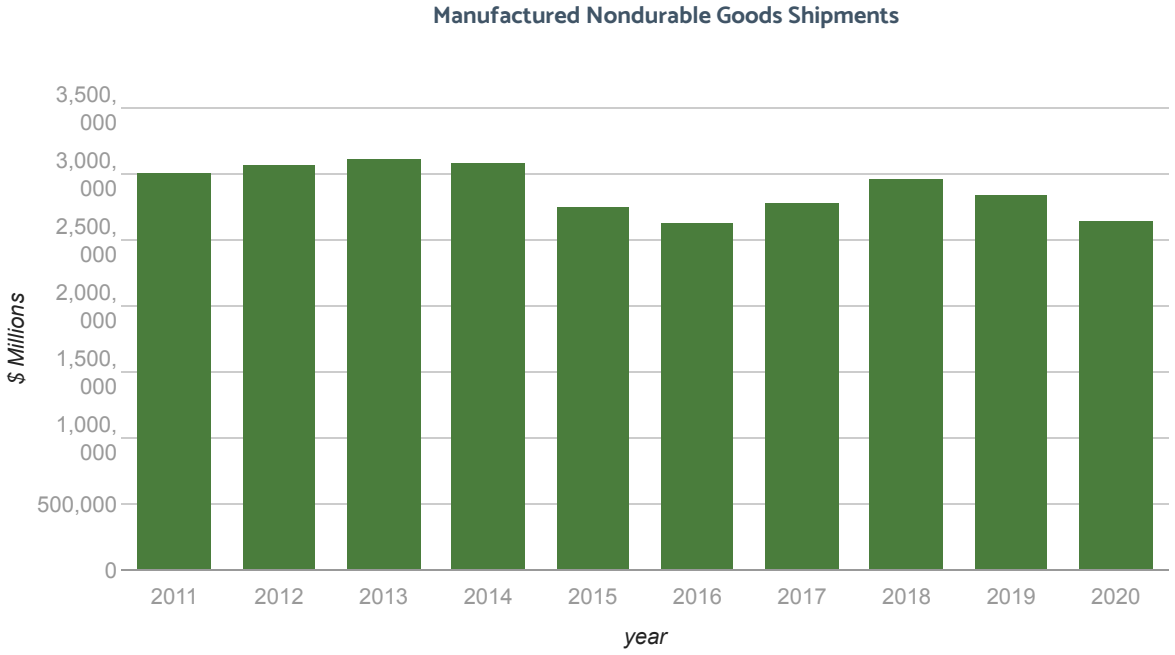
Seasonally-adjusted shipments of manufactured durable goods were $263.6 billion in November 2021, a 9.92% change compared to a year ago and a 0.69% change from the previous month, according to the latest data from the Census Bureau.



Source: Census Bureau

Seasonally-adjusted shipments of manufactured nondurable goods rose from a year ago

Seasonally-adjusted shipments of manufactured nondurable goods were $263.4 billion in November 2021, a 16.25% change compared to a year ago and a 0.65% change from the previous month, according to the latest data from the Census Bureau.

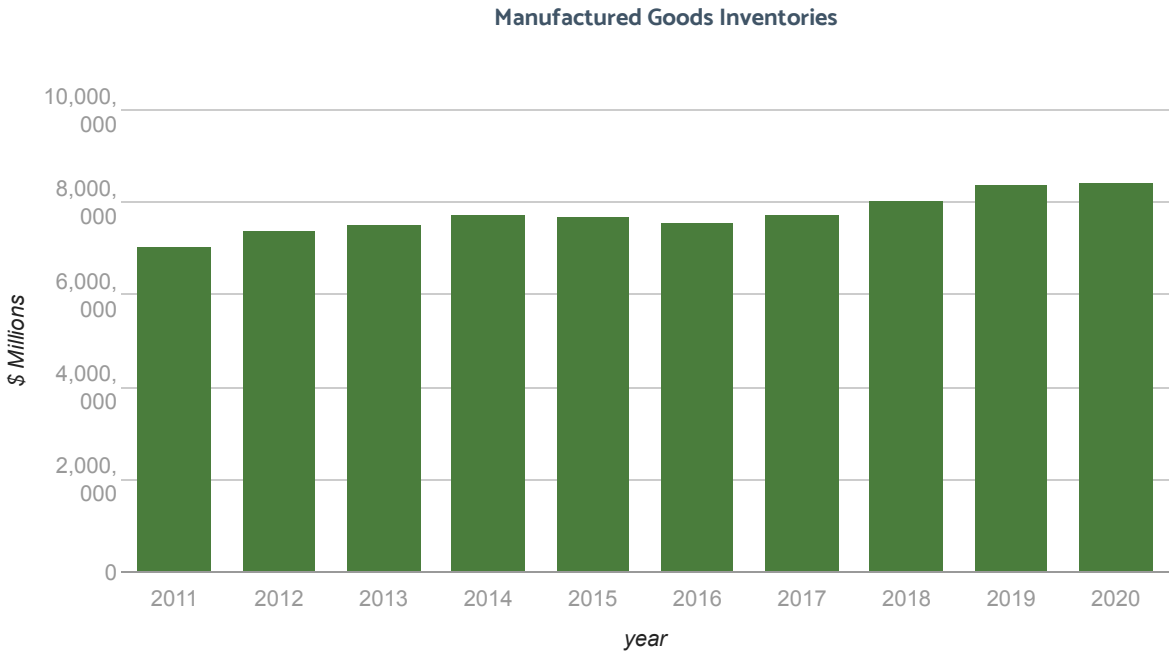


Source: Census Bureau

Inventory Trends

Seasonally-adjusted inventories of manufactured goods rose from a year ago

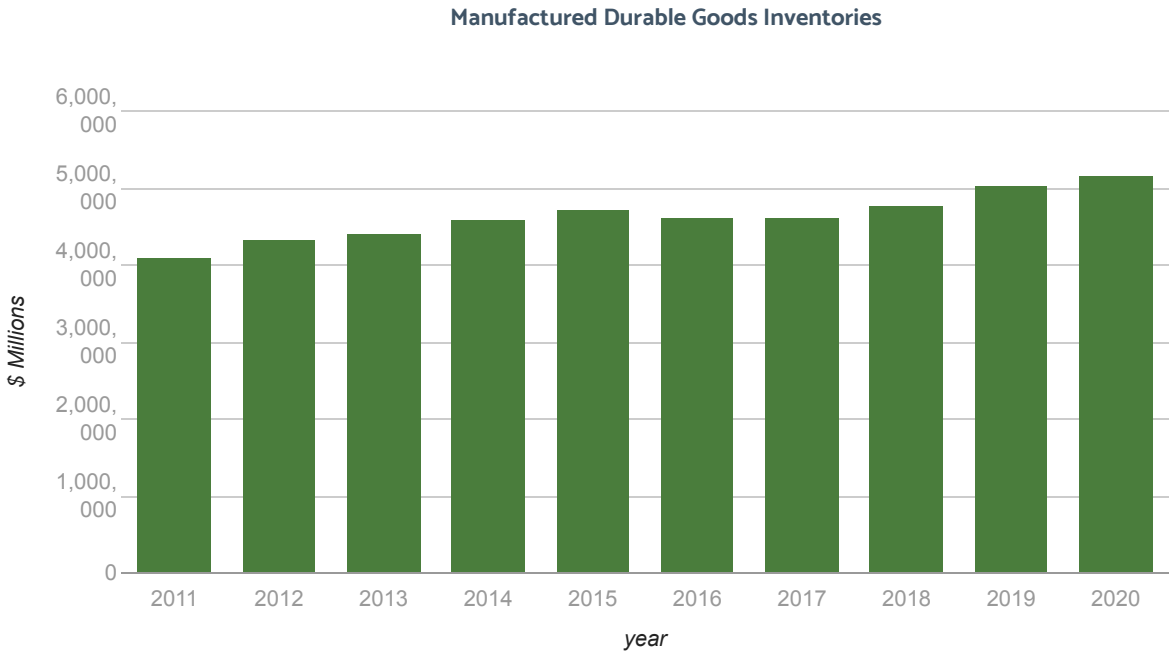
Seasonally-adjusted inventories of manufactured goods were $770.0 billion in November 2021, a 9.01% change compared to a year ago and a 0.69% change from the previous month, according to the latest data from the Census Bureau.



Source: Census Bureau

Seasonally-adjusted inventories of manufactured durable goods rose from a year ago

Seasonally-adjusted inventories of manufactured durable goods were $469.9 billion in November 2021, a 8.44% change compared to a year ago and a 0.67% change from the previous month, according to the latest data from the Census Bureau.



Source: Census Bureau

Seasonally-adjusted inventories of manufactured nondurable goods rose from a year ago

Seasonally-adjusted inventories of manufactured nondurable goods were $300.2 billion in November 2021, a 9.9% change compared to a year ago and a 0.73% change from the previous month, according to the latest data from the Census Bureau.

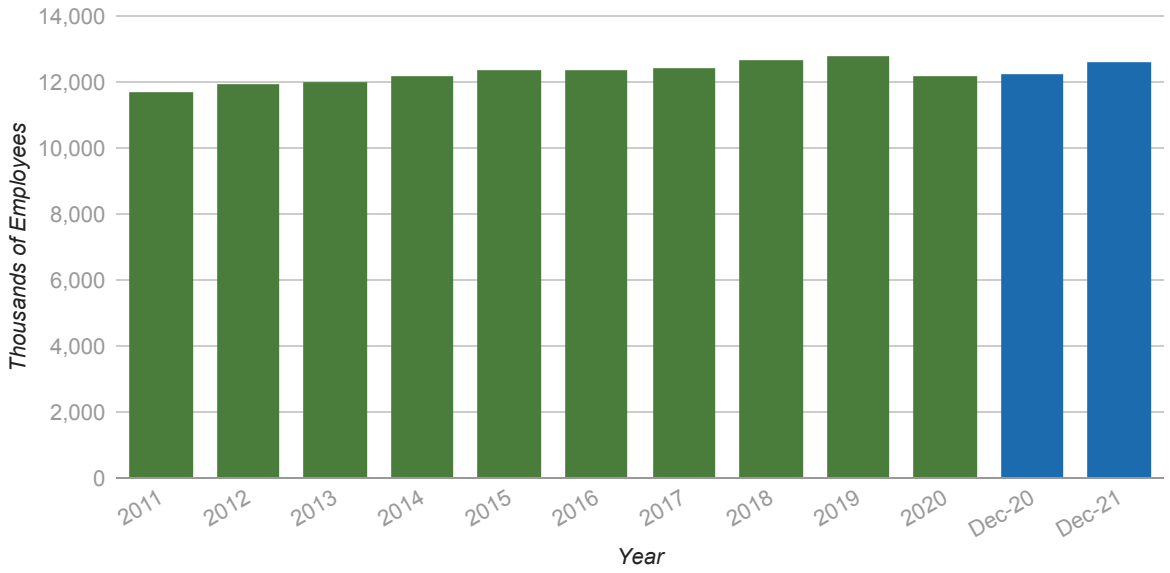
Source: Census Bureau

Employment and Wage Trends

Employment by manufacturing companies increases

Overall employment by manufacturing companies changed 2.9% in December compared to a year ago, according to the latest data from the Bureau of Labor Statistics.

US Manufacturing Sector Employment

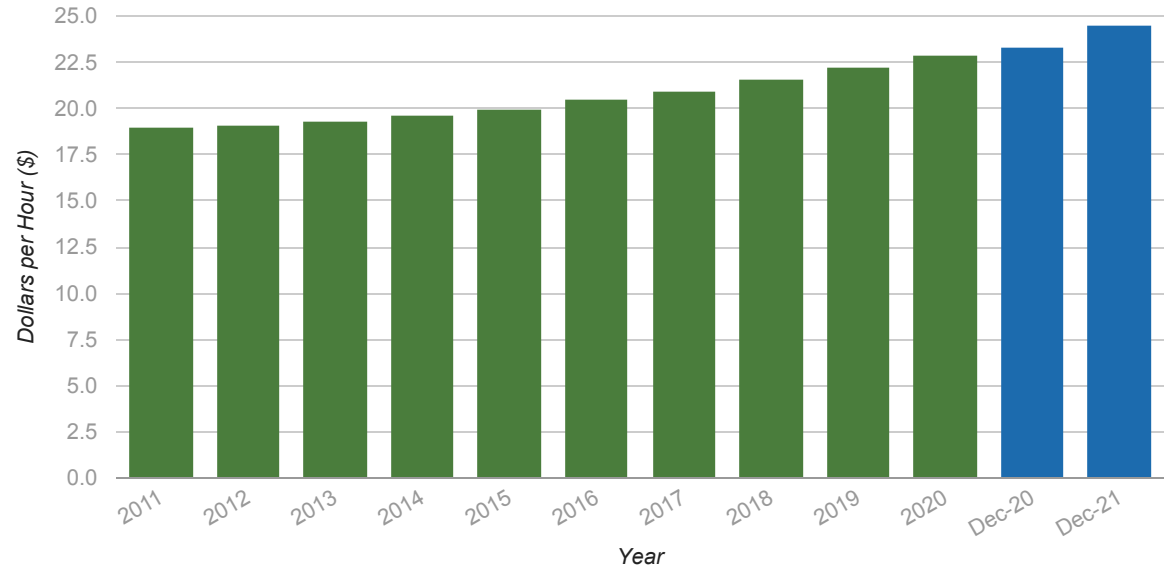


Source: Bureau of Labor Statistics

Wages at manufacturing companies rise

Average wages for nonsupervisory employees at manufacturing companies were $24.41 per hour in December, a 4.9% change compared to a year ago.

Average Wages for Nonsupervisory Employees



Source: Bureau of Labor Statistics

Cash Flow Management

Companies primarily generate revenue by selling goods to other manufacturers, wholesalers, retailers, exporters and end-customers. Additional revenue is generated by providing services such as designing and prototyping. Cash flow can be irregular with spikes or dips resulting from shopping holidays and retailer promotions, seasonal construction levels, and shifts in consumer spending, business investment in machinery and equipment, government spending, and prices.

Manufacturers may extend credit to customers to finance the purchase of their products. Manufacturers may experience delays in invoice payments, particularly for customers in the construction industry. Advanced payment or a deposit may be required by manufacturers to cover the cost of creating custom tooling or machinery configurations.

Many manufacturers use the just-in-time (JIT) production strategy, which minimizes investment in raw materials and finished inventory by closely matching production levels to customers' order demand. Cash remains free rather than tied up in overstocked raw materials and inventory that could get damaged in storage or become obsolete or spoil. Manufacturing processes often use significant amounts of electricity and fuel in their operations. The prices of petroleum-based fuels can rise or fall sharply, depending on global supply.

Strong competition from developing nations has forced manufacturers to reduce costs or specialize to maintain margins. As a result, many manufacturers produce goods outside of the US where labor costs are lower. Manufacturers also reduce labor costs by investing in automated equipment that can produce goods faster and with higher-quality than workers by hand.

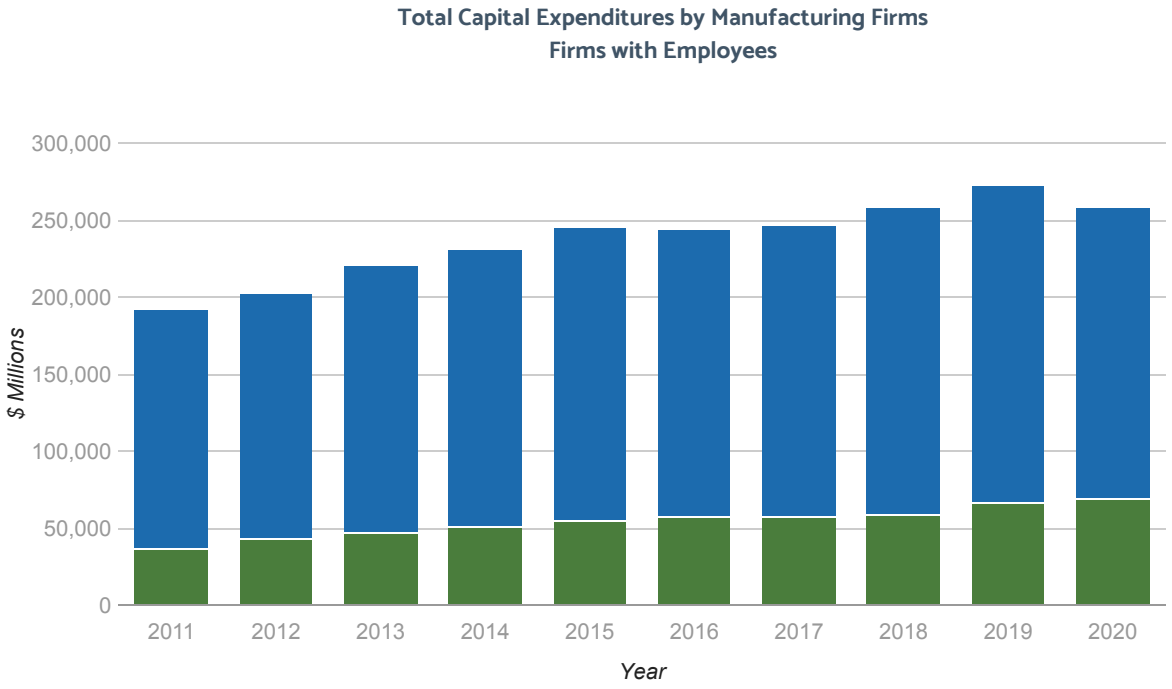
Manufacturers track inventory levels, material costs, labor productivity, and revenue per product line. Key management metrics include capacity utilization, breakeven volume, average unit price, and labor unit cost.

Capital and Foreign Investment

The manufacturing sector is capital intensive, requiring significant investment in facilities, machinery and inventory. The sector spends about 4-5% of annual revenue on capital expenditures.

Manufacturing firms invest in a broad range of machinery to process materials along the stages of production and final packaging, as well as equipment to store and transport materials. Most machinery is specialized to the type of manufacturing or products made. Common equipment includes storage shelving and racks, conveyor systems, and fork lifts. Industrial machinery and equipment may be primarily produced overseas. For these manufacturers, a large or customized production machine can take over a year after ordering to receive. To reduce upfront costs, manufacturers may finance or lease equipment. The sector spends about $6 billion per year on computers and hardware, $5 billion on software, $6 billion on data processing services and $5.5 billion on communications services.

Traditional sources of funding include cash on hand, commercial loans, private investors such as owners and partners, and stockholders.

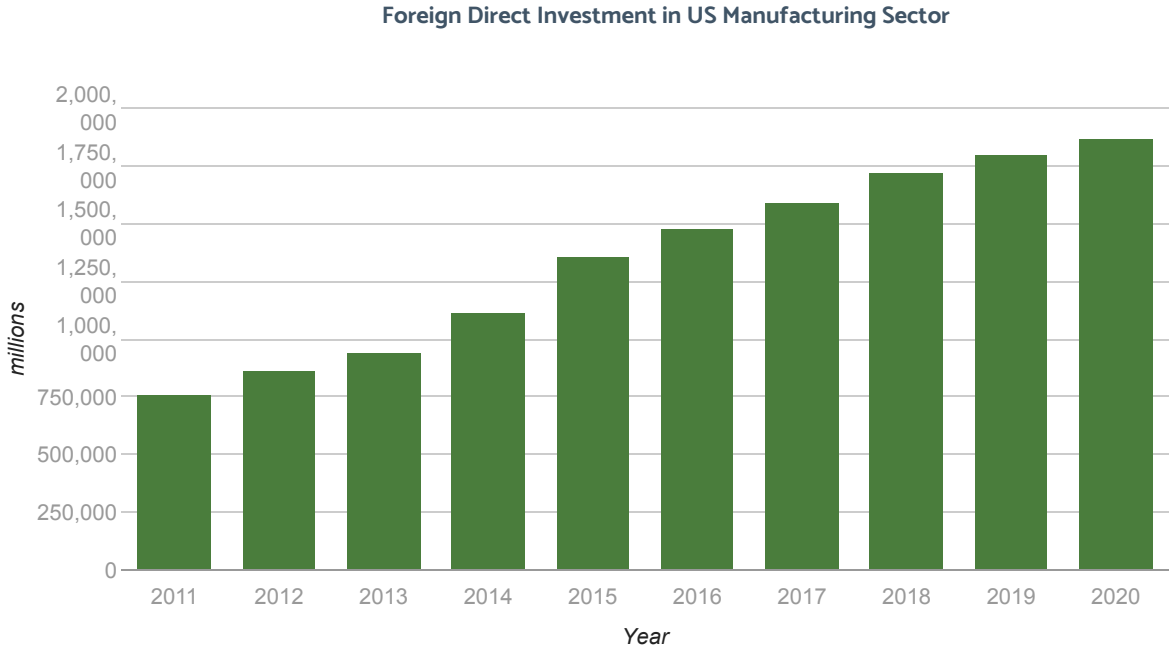


Source: Census Bureau

Foreign Investment

The US is an attractive market for foreign investors. The manufacturing sector represents about 40% of total foreign direct investment in the US. Foreign investors use their funds to acquire US firms, finance the establishment of new manufacturing firms and expand existing operations. Foreign spending to develop new companies from the ground up or to expand existing businesses is called greenfield investment. Within the manufacturing sector, foreign direct investment can shift significantly from year to year. For example, foreign spending related to US chemicals manufacturing has been as low as 23% of total investment in the manufacturing sector and as high as 70%. Food manufacturing has represented as little as 2% of foreign direct investment and as much as 32% in recent years.

Annual investment in the US manufacturing sector by foreign interests rose 3.4% in 2020 to exceed $1.8 trillion. Total FDI in the US rose 4.2% in 2020.



Source: Bureau of Economic Analysis

Financial Benchmarks

The following financial benchmark data is based on annual financial statements submitted by member institutions of the Risk Management Association from Q2 of the first year listed through Q1 of the following year.

Financial Ratios (US Manufacturing Sector, Industry-wide)

MEASURE	2018-19	2019-20	2020-21
Current Ratio	1.69	1.77	1.81
Quick Ratio	.85	.88	.98
Days Inventory	69.0	70.0	70.0
Days Receivables	43	41	43
Days Payables	34.0	31.0	34.0
Pre-tax Return on Revenue	4.49%	4.51%	5.65%
Pre-tax Return on Assets	7.56%	7.55%	8.65%
Pre-tax Return on Net Worth	17.84%	16.97%	19.87%
Interest Coverage	7.80	7.70	8.70
Current Liabilities to Net Worth	.77	.69	.69
Long Term Liabilities to Net Worth	0.59	0.56	0.61
Total Liabilities to Net Worth	1.36	1.25	1.30
Number of Firms Analyzed	*20,542*	*15,861*	*9,439*

Income Statement (US Manufacturing Sector, Industry-wide)

ITEM	2018-19	2019-20	2020-21
Revenue	100.0%	100.0%	100.0%
Cost of Sales	67.57%	67.34%	66.85%
Gross Margin	32.43%	32.66%	33.15%
Officers Compensation	1.24%	1.15%	1.28%
Salaries-Wages	8.25%	8.18%	8.68%
Rent	1.07%	1.07%	1.12%
Taxes Paid	1.94%	1.93%	2.0%
Advertising	1.53%	1.56%	1.66%
Benefits-Pensions	2.27%	2.26%	2.38%
Number of Firms Analyzed	*20,542*	*15,861*	*9,439*

ITEM	2018-19	2019-20	2020-21
Repairs	0.55%	0.55%	0.6%
Bad Debt	0.14%	0.14%	0.16%
Other SG&A Expenses	6.66%	6.8%	6.65%
EBITDA	8.78%	9.02%	8.62%
Amortization-Depreciation	3.02%	3.06%	3.36%
Operating Expenses	26.67%	26.7%	27.89%
Operating Income	5.77%	5.96%	5.26%
Interest Expense	1.14%	1.18%	1.14%
Other Income	-0.18%	-0.16%	-1.51%
Pre-tax Net Profit	4.81%	4.94%	5.64%
Income Tax	0.33%	0.33%	0.17%
After Tax Net Profit	4.48%	4.61%	5.47%
Number of Firms Analyzed	*20,542*	*15,861*	*9,439*

Balance Sheet (US Manufacturing Sector, Industry-wide)

ASSETS	2018-19	2019-20	2020-21
Cash	10.25%	10.89%	15.7%
Receivables	23.6%	22.31%	20.63%
Inventory	25.12%	25.22%	23.04%
Other Current Assets	2.8%	2.84%	2.94%
Total Current Assets	61.78%	61.27%	62.31%
Net Fixed Assets	26.03%	26.52%	25.46%
Net Intangible Assets	6.75%	6.46%	6.64%
Other Non-Current Assets	5.44%	5.75%	5.58%
Total Assets	*100.0%*	*100.0%*	*100.0%*

LIABILITIES			
Accounts Payable	13.49%	12.45%	11.02%
Loans/Notes Payable	12.79%	12.06%	11.08%
Other Current Liabilities	11.01%	10.98%	11.07%
Number of Firms Analyzed	*20,542*	*15,861*	*9,439*

LIABILITIES			
Total Current Liabilities	37.28%	35.5%	33.16%
Total Long Term Liabilities	23.53%	23.33%	26.48%
Total Liabilities	60.81%	58.83%	59.64%
Net Worth	39.19%	41.17%	40.36%
Total Liabilities & Net Worth	100.0%	100.0%	100.0%
Number of Firms Analyzed	*20,542*	*15,861*	*9,439*

Vertical IQ financial benchmark data is based on data provided by the Risk Management Association (RMA) and Powerlytics, Inc. RMA's Annual Statement Studies provide comparative industry financial benchmarks based on financial statements of small and medium business clients of RMA's member institutions. Additional detail on income statement line items is provided using Powerlytics financial benchmarks, which are based on reporting submitted to the IRS. Additional detail on these data sources can be found at RMA and Powerlytics.

Quarterly Insight

4th Quarter 2021

Omicron Variant Brings More Uncertainty for Supply Chains

In early December, the Organization of Economic Co-Operation and Development (OECD) said the global economy continues to rebound, but suggested the emergence of the Omicron variant of the coronavirus points to rising risks and imbalances in the recovery. The OECD expects global GDP to rise 5.6% in 2021, then moderate to 4.5% growth in 2022. However, the threat of continued COVID-19 outbreaks may magnify existing problems, including supply chain disruptions, labor and materials shortages, and inflation. The OECD said the emergence of the Omicron variant highlights the need to speed up global vaccine rollouts to prevent the emergence of additional variants. Wider vaccination efforts may also help ease supply chain logjams by enabling a wider reopening of manufacturing facilities, ports, and borders.

3rd Quarter 2021

Automation Increases Exposure to Cyberattacks

Increasing reliance on automation will force the manufacturing sector to spend more on cybersecurity. Cybersecurity industry professionals say that the manufacturing industry is notorious for avoiding large investments. By most assessments, manufacturing lags behind most industries, including sectors that face government regulation, like healthcare and finance. “There is a real dichotomy between the regulated and unregulated spaces,” said Chad Paalman, founder and CEO of NuWave Technology Partners. “I hate to say this, but the unregulated companies, a lot of them are making changes because they’re finding out the hard way. They touched the stove and it was hot.”

2nd Quarter 2021

Firms Want Steel Tariffs Terminated

Over 300 manufacturing firms have asked President Biden to end Section 232 steel and aluminum tariffs that were initiated three years ago under the Trump administration. The firms cited supply shortages, long lead times, and artificially high prices of key inputs as key reasons to end the tariffs. “Without termination of the tariffs, this situation will worsen if Washington moves forward with an infrastructure bill to invest in America, as these projects will create more strain on domestic steel and aluminum supplies, causing delays in construction and risking manufacturing jobs,” wrote the manufacturers.

1st Quarter 2021

Executive Order may Boost Sector

President Biden signed an executive order in January aimed at closing loopholes in existing “Buy American” provisions, which, according to Reuters news service, apply to about a third of the $600 billion in goods and services the federal government buys each year. The order will make any waivers more transparent and create a senior White House role to oversee the process. Biden’s order also directs federal agencies to reevaluate the threshold used to determine US content, a move intended to prevent companies that sell to the government from importing largely foreign-made goods and selling them as US-made. New percentages for required U.S. content will be determined as a result of the process. Industry experts say that the order is part of Biden’s plan to revitalize the manufacturing sector, which accounts for about 12% of the economy. It is also a key part of Biden’s broader push to drive up wages, create more union jobs, support minority-owned businesses and strengthen U.S. supply chains. A Biden administration official said that updated Buy American provisions would be fully consistent with US commitments under the World Trade Organization, and Washington would work with trade partners to modernize global rules.

4th Quarter 2020

Goldman Sachs Cuts GDP Growth Estimate

Investment bank and financial services company Goldman Sachs halved its outlook for Q4 economic growth to 3% after changing its base case to include a lack of new stimulus until 2021. The lack of federal stimulus will push disposable income to pre-pandemic levels and lower consumer spending through the end of the year, Goldman said. The bank raised its GDP forecast for the second quarter of 2021 to 7% from 6% on a quarter-over-quarter basis, citing the expectation of a new stimulus being passed in the new year and the arrival of a coronavirus vaccine. Estimates for the third and fourth quarters of 2021 were lifted to 4.5% and 3.5%, respectively.

4th Quarter 2020

Industrial Production Declines Unexpectedly

Industrial production fell 0.6% month over month in September following four months of growth after sharp declines in March and April. Manufacturing output fell 0.3% after rising 1.3% in August, and manufacturing capacity utilization dropped 0.2% to 71.5%. Industrial production is currently 7.1% beneath its February level despite the substantial gains of the past four months. “Industrial output came in well below expectations, one of the first real signs that the recovery is losing momentum under the weight of the ongoing health crisis and fading support from fiscal relief,” Oxford Economics said in a research note.

3rd Quarter 2020

Capital Goods Orders, Shipments Rebound

New orders for US-made capital goods including tools, buildings, vehicles, machinery, and equipment increased by the most in nearly two years in June, according to the US Commerce Department. Orders for non-defense capital goods excluding aircraft rose 3.3% in June compared to the prior month, the biggest month-over-month increase in core capital goods orders since July 2018. The increase followed a 1.6% rise in May, but June orders were 3.2% below the February level. Shipments of core capital goods rose 3.4% during the period, the biggest gain since November 2013. June shipments remained 3% below the February level.

2nd Quarter 2020

Output, Employment Decline

Manufacturing output declined 7.1% year over year in Q1 2020, according to the Federal Reserve, the sharpest decline since Q1 2009. Durable goods manufacturing employment declined 12% year over year in April, while nondurable goods manufacturing employment declined 9%, according to the US Bureau of Labor Statistics. Not all manufacturers are reporting declines. Americans continue to stock up on groceries during the pandemic, and that is boosting the food manufacturing sector. ”We are experiencing a record number of orders due to COVID-19,” one manager in the food and beverage industry reported.

Sector Terms

Capacity Utilization

The percentage of total production capacity used in a given period.

Design for Manufacturing (DFM)

Manufacturer provides insight to designers and inventors on how to design a product for easier or more cost-effective production.

Durable Goods

Items that typically last over 3 years, such as furniture and automobiles.

Finished Products

Items that have competed the production process.

Foreign Direct Investment (FDI)

Investment by a company or individual in a business in another country for the purpose of ownership or controlling interest.

IIoT

Industrial Internet of Things

JIT - Just In Time

Purchasing inventory as needed to meet production demand. Reduces inventory cost, storage requirements and waste.

Lean Manufacturing

Increasingly efficient production, minimizing waste of materials and labor.

Mass Production

The manufacture of large quantities of a standardized product, usually involving a high degree of automation.

Nondurable Goods

Items that are quickly consumed and replaced, such as food.

Raw Material

An ingredient or component used to manufacture a product.

Semi-finished Products

Manufactured goods that are components of other products or require additional processing to meet customer specifications.

Unit Labor Cost

The amount of money spent on labor to create a single unit of product.

Work in Process

A partially-manufactured item that has not completed the production process.

Web Links

National Association of Manufacturers
News, data, and advocacy

Alliance for American Manufacturing
Issues, research, advocacy, and blog

Association for Manufacturing Excellence
News, events and resources

Association for Manufacturing Technology
News, events, and resources

Fabricators & Manufacturers Association, International
Blog, events, directory and resources

Manufacturing Market Insider
News and trends on electronic manufacturing services (EMS)

East West Manufacturing
Contract manufacturers' blog

Related Profiles

US Construction Sector

NAICS: 23 SIC: 15, 16,17

US Healthcare Sector

NAICS: 62 SIC:

US Mining and Energy Extraction Sector

NAICS: 21 SIC: 10, 12, 13, 14

US Retail Sector

NAICS: 44, 45 SIC: 52, 53, 54, 55, 56, 57, 59

US Wholesale Sector

NAICS: 42 SIC: 50xx, 51xx
