The U.S. Manufacturing Sector: Efforts to Bring Manufacturing Back to America

Trends, Challenges, and Opportunities Ahead

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Executive Summary

U.S. manufacturing represents a $2.91 trillion economy that, on its own, would rank as the world's 8th largest economy, surpassing Italy, Canada, and Brazil. The sector supports 17.1 million indirect jobs while directly employing 13 million Americans at premium wages averaging $103,000 annually.

However, on the global stage, the U.S. competes with manufacturing powerhouses such as China, Germany, Canada, and Mexico. The Trump administration is pushing to promote reshoring and “Made in America” policies. Yet progress has been uneven, as evidenced by a 311-point drop in the 2025 Reshoring Index, driven by rising imports from Asia. Government policy has sought to bolster domestic capabilities through major legislation, including the Bipartisan Infrastructure Law, the CHIPS and Science Act, and the Inflation Reduction Act, which are channeling billions into semiconductor production, clean energy manufacturing, and infrastructure modernization.

The sector is undergoing a profound transformation under Industry 4.0, integrating artificial intelligence, the Internet of Things, robotics, additive manufacturing, etc. These innovations are enabling “smart factories” capable of real-time optimization, predictive maintenance, and adaptive production. However, this technological shift has amplified the urgency of addressing workforce challenges.

Key Challenges: For tariffs and reshoring initiatives to achieve their intended impact, the manufacturing sector must simultaneously address multiple challenges, including the cost competitiveness gap, skilled labor supply, and infrastructure modernization. Economic pressures, including sticky inflation, rising long-term interest rates, and ongoing geopolitical tensions, are simultaneously affecting investment decisions, potentially undermining the positive effects of protective trade policies.

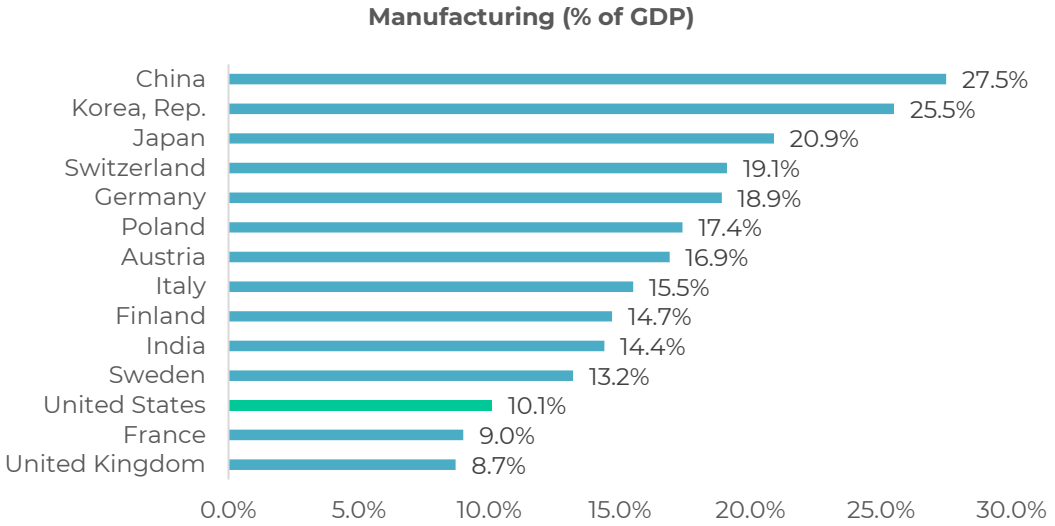
Push towards Reshoring: The current US administration is trying to promote local manufacturing and is using essentially a fiscal tool (tariffs) to raise prices of imports so that the local manufacturers become more competitive. There are fundamental structural challenges to this strategy. The problem arises at the tail end of the supply chain, which is typically low-cost and often outsourced, making it unviable for production in the USA. However, US manufacturing is at the front end of the supply chain, producing high-end, value-added products that consumers are willing to pay a premium. For example, Apple sells iPhones in the millions worldwide; however, the actual phones are manufactured in Asia, with a supply chain spanning dozens of countries. Moving the entire global supply chain inside the US will be challenging and will require significant manufacturing capacity (currently outsourced/offshore), which is best used for other high-value-added products such as chemicals, automobiles, aerospace, and agriculture.

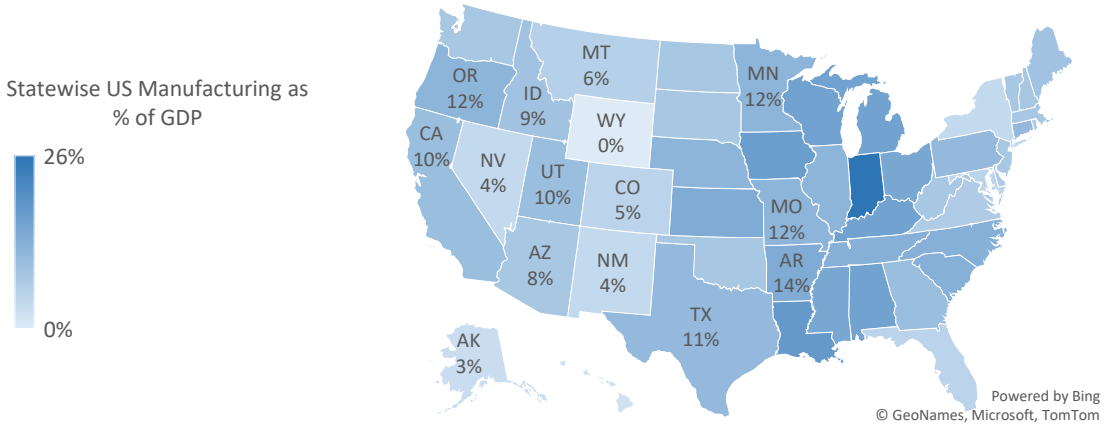
Reshoring & Dollar Dominance (A Structural Contradiction): De-dollarization poses a major obstacle to large-scale U.S. manufacturing reshoring by undermining one of America’s key advantages, the dollar’s global dominance. For decades, the dollar’s role as the world’s primary reserve and trade currency has let the U.S. finance deficits cheaply, import goods at lower cost, and sustain global demand for its assets. Current analysis suggests that the United States cannot resolve this tension through incremental policy adjustments—the contradiction is structural rather than cyclical. Any serious reindustrialization effort would place direct downward pressure on dollar dominance, whereas preserving monetary hegemony would make manufacturing competitiveness nearly impossible. Washington ultimately faces a binary choice between maintaining its role as a financial empire or becoming a competitive manufacturing economy. The economic dynamics indicate these objectives are fundamentally incompatible within the current global monetary framework, suggesting that America's industrial revival ambitions may require sacrificing its privileged position in the international financial system.

In conclusion, while reshoring manufacturing to the U.S. is politically appealing as a strategy to strengthen economic security, the structural realities make it a formidable challenge. High domestic labor costs, regulatory hurdles, and infrastructure constraints already diminish the competitiveness of U.S.-based production, and the accelerating trend of de-dollarization compounds these difficulties by raising financing costs and increasing the price of imported inputs. In short, large-scale reshoring is unlikely to succeed, with near-shoring and friend-shoring emerging as more practical strategies for balancing resilience with economic viability.

US Manufacturing | Historical Context – From 20th Centaury to Today (1/2)

- **U.S. manufacturing has fallen from 21-25% of GDP in 1950s to about 10% today. Japan, Germany, and other developed countries have maintained strong manufacturing sectors at 15-25% of GDP.**





The 20th century witnessed a dramatic transformation in US manufacturing, evolving from a primarily agrarian society to a global industrial economy. This period went through a series of industrial revolutions and was characterized by significant growth, technological innovation, and shifts in regional dominance, ultimately shaping the American economy and its role in the world.

First Industrial Revolution - Late 1700s Britain

- Steam Engines: Pressurized steam-powered factories, mines, and mills around the clock, eliminating dependence on water wheels and human labor.
- Factories: Dedicated manufacturing buildings consolidated production processes, creating specialized spaces for steel mills, cotton mills, and other industries.
- Textile Machinery: The spinning jenny, flying shuttle, and power loom revolutionized fabric production, making it faster with less human intervention.
- Impact: Manual artisan craftsmanship gave way to mechanized mass production, urbanizing small towns and creating countless new jobs.

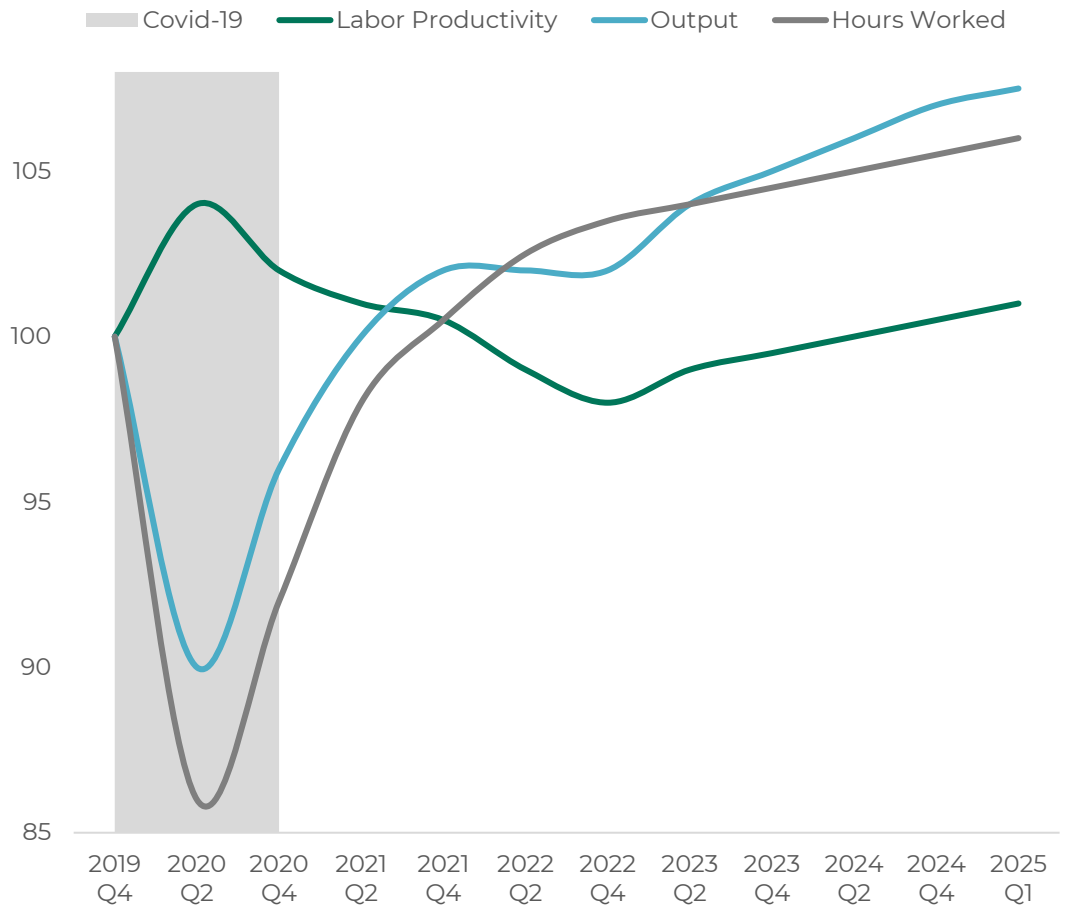
Second Industrial Revolution - 1901 Assembly Line Era

- Assembly Line Innovation: Ransom E. Olds pioneered the moving assembly line for automobiles, increasing his factory output by an astounding 500% in just one year. Henry Ford furthered the assembly line by incorporating more advanced techniques in the assembly process.
- Conveyor Belt System: Products moved step-by-step through multiple workstations, with each worker performing specialized tasks as items progressed toward completion.
- Standardization: This method standardized production processes, making complex products like cars affordable and accessible to the masses.
- Global Adoption: The assembly line concept spread rapidly across Europe and North America, transforming manufacturing industries worldwide.

Source: Industry today, AJAW on The Evolution of Manufacturing Technology: From Past to Present, World Bank Data and KTrade Research

US Manufacturing | Historical Context - From 20th Centaury to Today (2/2)

Manufacturing sector labor productivity increased 4.4 percent in the first quarter of 2025, as output increased 4.8 percent and hours worked increased 0.4 percent. This is the largest increase in productivity since the second quarter of 2021, when the measure increased 5.3 percent



Third Industrial Revolution - 1948 Lean Manufacturing

- Toyota's Philosophy: Toyota Motor Corporation introduced lean manufacturing to eliminate waste in overproduction, transportation, processing, and inventory management.
- "Just in Time" System: Production focused on creating exactly "what is needed, when it is needed, and in the amount needed," minimizing storage costs and waste.
- Continuous Improvement: The system emphasized ongoing refinement and efficiency optimization, setting new standards for manufacturing excellence.
- Supply Chain Revolution: This approach transformed how companies managed inventory and supplier relationships, influencing global manufacturing practices.

Late 20th Century: Globalization & Automation

- Globalization: The 1970s and onward saw increasing international trade and competition, culminating in free-trade agreements like NAFTA (1994), which opened markets but triggered heated debate over American job losses and factory closures.
- Automation: Simultaneously, the sector embraced automation—moving from mechanical to computer-controlled production and later to robotics—boosting output per worker but reducing the need for labor.
- Declining Employment: Manufacturing employment peaked in 1979 (19.6 million) and then began a long decline, dropping to 12.8 million by 2019 and to nearly 11.5 million in 2009

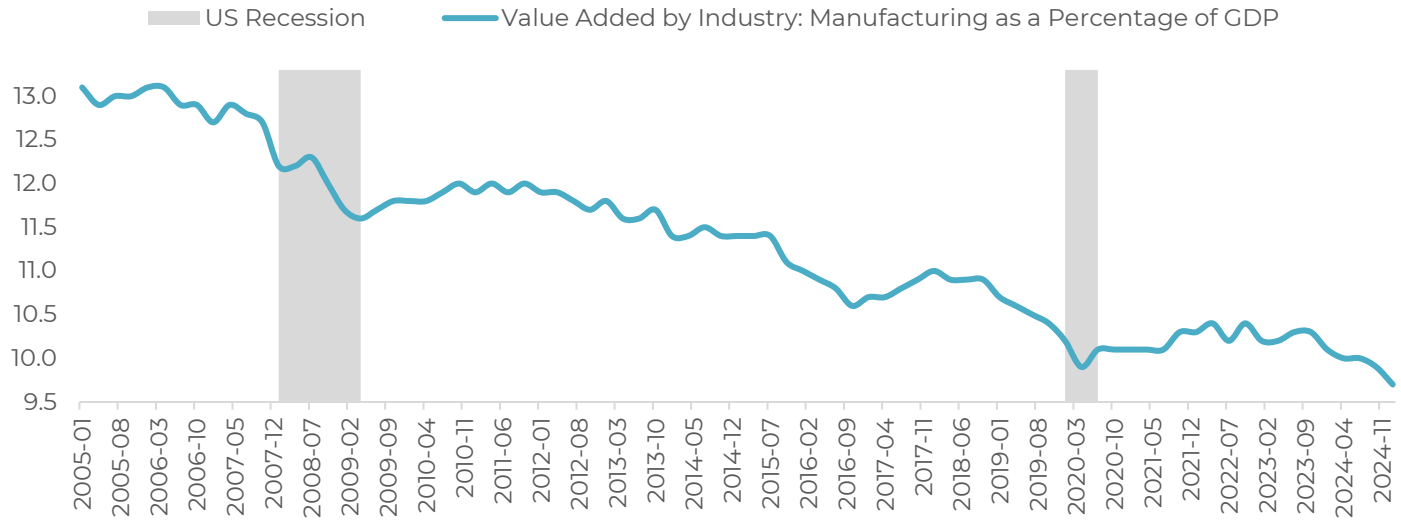
Fourth Industrial Revolution - Present Industry 4.0

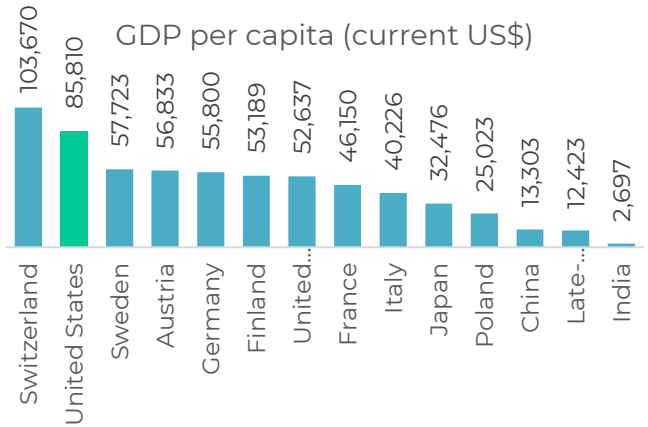
- Internet of Things (IoT): Smart cameras in candy factories automatically detect filling errors and instruct machines to correct them, showcasing real-time quality control through connected devices.
- Cloud Computing: Manufacturers store and process massive amounts of production data on remote servers, saving physical space while enabling advanced analytics and insights.
- AI & Automation: Artificial intelligence, digital twins, and autonomous robots work together to create self-optimizing smart factories that adapt and improve continuously.
- Digital Integration: Advanced technologies enhance not just manufacturing but entire supply chains and product lifecycle management for unprecedented efficiency.

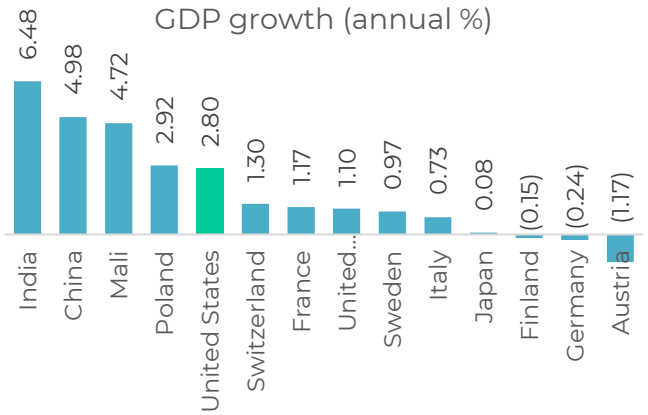
Source: Industry today, AJAW on The Evolution of Manufacturing Technology: From Past to Present and KTrade Research

US Manufacturing | Sector Snapshot

- **U.S. manufacturing is worth $2.91 trillion economic powerhouse that would rank as the world's 8th largest economy if it were a standalone country, employing nearly 13 million workers and contributing 17.1% to GDP through direct and indirect value.**







US Manufacturing in Brief

- Manufacturing accounted for 9.7% of value-added output in the U.S. economy in Q1 2025.
- There were nearly 13 million manufacturing workers as of July 2025.
- U.S.-manufactured goods exports totaled more than $1.6 trillion in 2024.
- Direct and indirect (i.e., purchases from other industries) manufacturing value added contributed an estimated 17.1 % of GDP.
- U.S. manufacturing represents approximately 9.7 % of total U.S. employment.

US manufacturing alone is worth $2.91 trillion in 2024, it would rank as the world's 8th largest economy if it were its own country. To put this in perspective, American manufacturing produces more economic value than entire nations like Italy, Canada, Brazil, Russia, and South Korea. Only seven countries have larger total economies than what US factories and manufacturers produce each year. This shows just how important manufacturing is to the American economy.

Source: National Association of Manufacturers, NIST Annual Report on US Manufacturing and KTrade Research

US Manufacturing | Technological Transformation and Impact on Labor

- **The U.S. manufacturing sector is experiencing a profound Industry 4.0 transformation through the integration of AI, IoT, robotics, and additive manufacturing technologies that are reshaping factories nationwide.**

Industry 4.0: AI, IoT, Robotics, Additive Manufacturing:

Industry 4.0, also known as the Fourth Industrial Revolution, represents a paradigm shift in manufacturing. It involves the seamless connectivity of machines, systems, and sensors, enabling real-time data exchange and analysis. Key technologies driving this transformation include:

- **Artificial Intelligence (AI)**
- **Internet of Things (IoT)**
- **Robotics: Additive Manufacturing (3D Printing)**
- **Smart Factories and Automation**
- **Digital Twins and Advanced Analytics**

Impact on Labor Demand: Quantity and Quality:

- **Reduction in Low-Skill Jobs:** Automation and robotics replace many repetitive, manual, and routine tasks, causing a decline in demand for low-skilled labor. Vulnerable worker groups such as unskilled labor, women, youth, migrants, and the elderly are most affected, potentially facing technological unemployment.
- **Increased Demand for Skilled Workers:** There is a heightened demand for workers with technical skills such as programming, data analysis, AI expertise, machine learning, cybersecurity, and the ability to work with emerging technologies like cobots and IoT systems. Upskilling and reskilling have become crucial in advanced, high-tech manufacturing. While some jobs are lost, new roles emerge that are more technical and advanced. Workers need enhanced technical training to adapt to more complex and data-driven roles.
- **Labor Productivity Gains:** Adoption of Industry 4.0 technologies typically improves labor productivity (e.g., 7% increase in Italian SMEs), though the effect varies depending on technological level and diversity of adoption.

Robot Deployment and Job Displacement

- A single robot implemented in the manufacturing industry replaces 1.6 workers.
- The US uses 189 robots in manufacturing per 10,000 workers (as of 2023).
- U.S. manufacturing: 1.974 robots per 1,000 workers.
- One more robot per thousand workers reduces the employment-to-population ratio by 0.2 percentage points and wages by 0.42%.

Manufacturing Job Losses

- In the manufacturing industry alone, we've lost 1.7 million jobs over the past 20 years.
- There are 2.2 million industrial robots in use today, all of which have replaced the human labor force.

Recent AI Impact

- For the first seven months of 2025, rising adoption of generative AI technology by private employers accounted for more than 10,000 job cuts. The United States saw a 22% increase in AI-induced layoffs from Q4 2023 to Q1 2025
- AI has already displaced 14% of all workers

Industry-Specific Cases

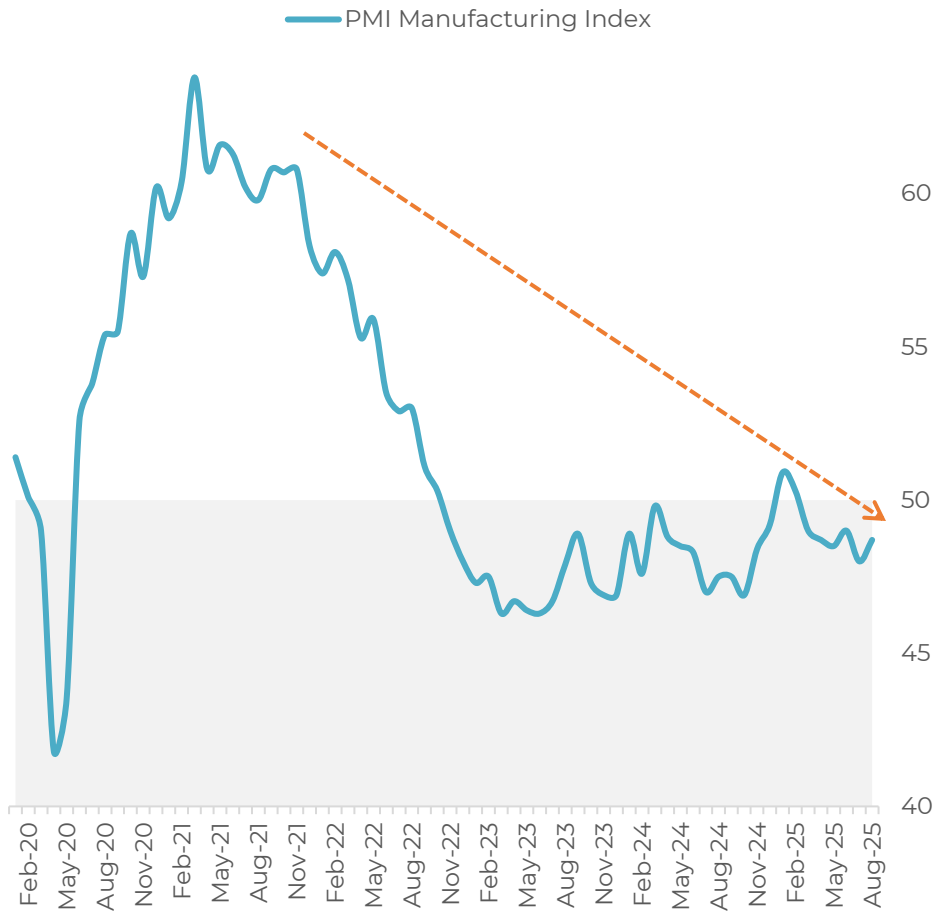
- **Automotive Sector**
  - The automotive industry employs a large percentage of manufacturing robots in the US, at a rate of 7.5 robots per 1,000 workers
  - This represents one of the highest concentrations of automation in manufacturing
- **Retail and Logistics**
  - Companies like Walmart are actively implementing automation for sorting and packing operations, reducing demand for warehouse workers and material handlers.

The advent of such advanced technologies is fundamentally reshaping the manufacturing workforce landscape. As these technologies automate routine tasks, enable predictive maintenance, and optimize production processes, they are indeed reducing the demand for traditional manual labor in certain areas. The reduction in overtime hours might reflect not just fewer workers needed, but also more efficient operations that eliminate the need for extended work periods.

Source: Rhodium Group Research paper “Trade Diversion: Blessing or Curse?”, CBS Interactive Inc. (AI is leading to thousands of job losses, report finds), Article from Teamstage (Jobs Lost to Automation Statistics in 2024) and KTrade Research

US Manufacturing | Manufacturing contraction and Government Interventions

- **Some US manufacturers describing the current business environment as "much worse than the Great Recession.“ (ISM PMI August 2025 report)**



The Current state of US Manufacturing

- The US manufacturing sector has been experiencing contraction since September 2022, with the Institute for Supply Management (ISM) manufacturing PMI registering 48.7, indicating continued weakness in the sector that comprises approximately 10% of the national economy.

Industry-Specific Impacts

- The reason for the manufacturing sector's prolonged decline has been characterized by widespread industry contraction and deteriorating business conditions. This is due to several industries reporting contraction.
- For example, 10 industries reporting contraction were makers of paper products, machinery, electrical equipment, appliances and components as well as computer and electronic products.
- The severity of current conditions has been particularly striking, with some manufacturers describing the current business environment as "much worse than the Great Recession.“. The sustained contraction in US manufacturing reflects the complex challenges facing domestic producers as they navigate current trade policies while attempting to maintain competitive operations and employment levels across multiple industrial sectors.

US Government efforts to revitalize US manufacturing

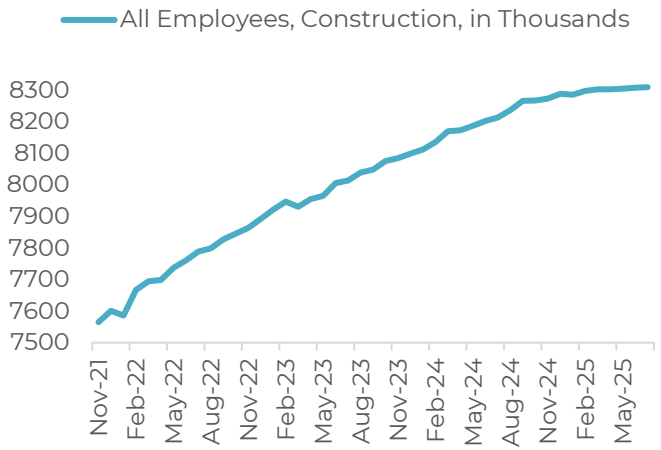
The Trump administration's push to revitalize U.S. manufacturing reflects broader strategic concerns:

- **Declining Global Position**: US manufacturing share dropped from 28.4% (2001) to 17.4% (2023), with 5 million jobs lost since 1997.
- **National Security Risks**: Low military stockpiles and insufficient defense manufacturing capacity threaten security commitments to allies.
- **Supply Chain Vulnerabilities**: COVID-19 and Houthi shipping attacks exposed dangerous dependence on foreign producers.
- **Critical Sector Gaps**: Loss of capacity in autos, shipbuilding, pharmaceuticals, and advanced technology threatens permanent competitive decline.
- **Strategic Independence**: Need for domestic production of emerging technologies (bio-manufacturing, batteries, microelectronics) for future defense capabilities.

Source: Institute for Supply Management, Reuters news article (US manufacturing contracts), The White House Fact Sheet and KTrade Research

US Manufacturing | Government Trade Policy Effects

Since the Bipartisan Infrastructure Law (BIL) was enacted in November 2021, it has generated approximately 224,000 new jobs.



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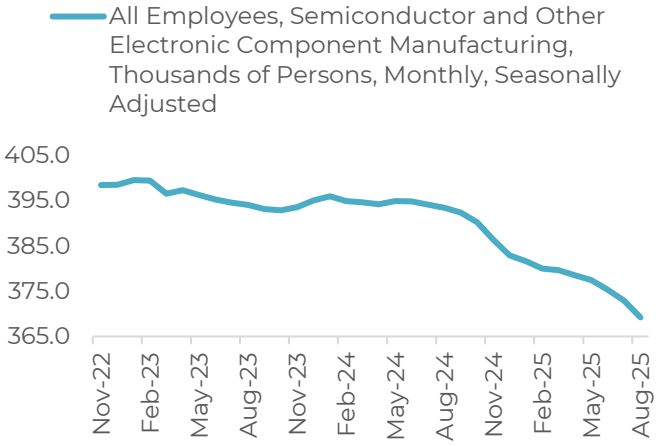
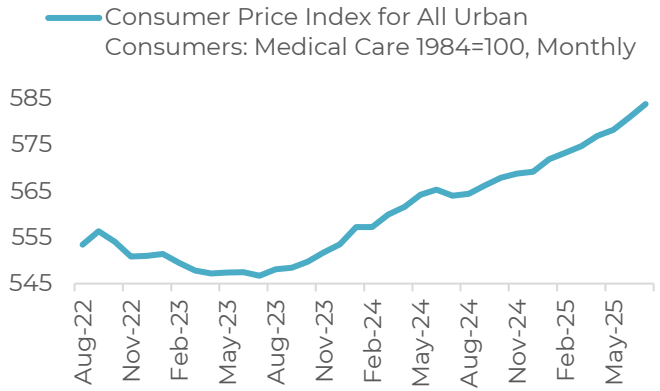
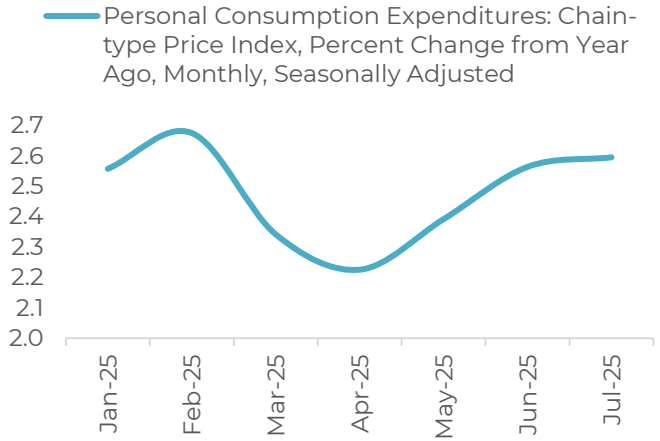


The Inflation Reduction Act (IRA) was primarily enacted in August 2022 to control Medicare costs. While costs initially decreased for a year, they have consistently increased since then



Inflation has been sticky and hovering above 2.5% well above the 2% inflation target



Several landmark pieces of legislation have been enacted to support and reshore American manufacturing and job creation. Key policies are as follows:

- **Bipartisan Infrastructure Law (BIL) - November 2021:** A $1.2 trillion investment to rebuild America's roads, bridges, broadband networks, water systems, and other critical infrastructure while creating jobs.
- **CHIPS and Science Act (CHIPS Act) - August 2022:** Provides over $50 billion in subsidies and tax credits to boost domestic semiconductor manufacturing and reduce America's reliance on foreign chip production.
- **Inflation Reduction Act (IRA) - August 2022:** Tackles climate change through clean energy incentives, allows Medicare to negotiate prescription drug prices, and reduces the federal deficit while investing in domestic energy production.

Policy Effects

U.S. policy initiatives, including tariffs, have had mixed economic impacts. The Bipartisan Infrastructure Law (BIL) was designed to rebuild America's infrastructure and achieved notable success in the construction sector, adding 224,000 jobs after its passage. The CHIPS Act aimed to boost domestic semiconductor manufacturing. However, employment in semiconductor and electronic component manufacturing has consistently declined, reflecting increased automation in these facilities. While automation enhances productivity, it simultaneously reduces demand for manual labor. The Inflation Reduction Act was primarily designed to control Medicare costs. Although the Medicare Consumer Price Index decreased one year after implementation, it has risen consistently thereafter, suggesting limited long-term effectiveness in cost containment.

Source: The Budget Lab at Yale and KTrade Research

US Manufacturing | The Reshoring Movement: Drivers and Trends

What Is Reshoring?

Reshoring refers to the process of relocating manufacturing operations from foreign countries back to a company's domestic base. While offshoring became popular in the early 2000s as a way to cut labor costs, it often came at the expense of control, speed, and resilience. In contrast, reshoring aims to restore some of that control by shortening supply chains, reducing dependency on foreign partners, and aligning production closer to customers.

Reshoring vs. Nearshoring vs. Offshoring

It's helpful to distinguish between the three major approaches to US manufacturing:

1. **Reshoring** means bringing operations back to the U.S.
2. **Nearshoring** relocates production to nearby countries like Mexico or Canada—though recent tariffs tied to the USMCA are reducing the appeal of this option.
3. **Offshoring** sends manufacturing to distant countries (often in Asia) to capitalize on lower labor costs, but it comes with longer lead times and more exposure to geopolitical risk.

As companies navigate a changing trade environment, many are re-evaluating which of these approaches makes the most strategic sense..

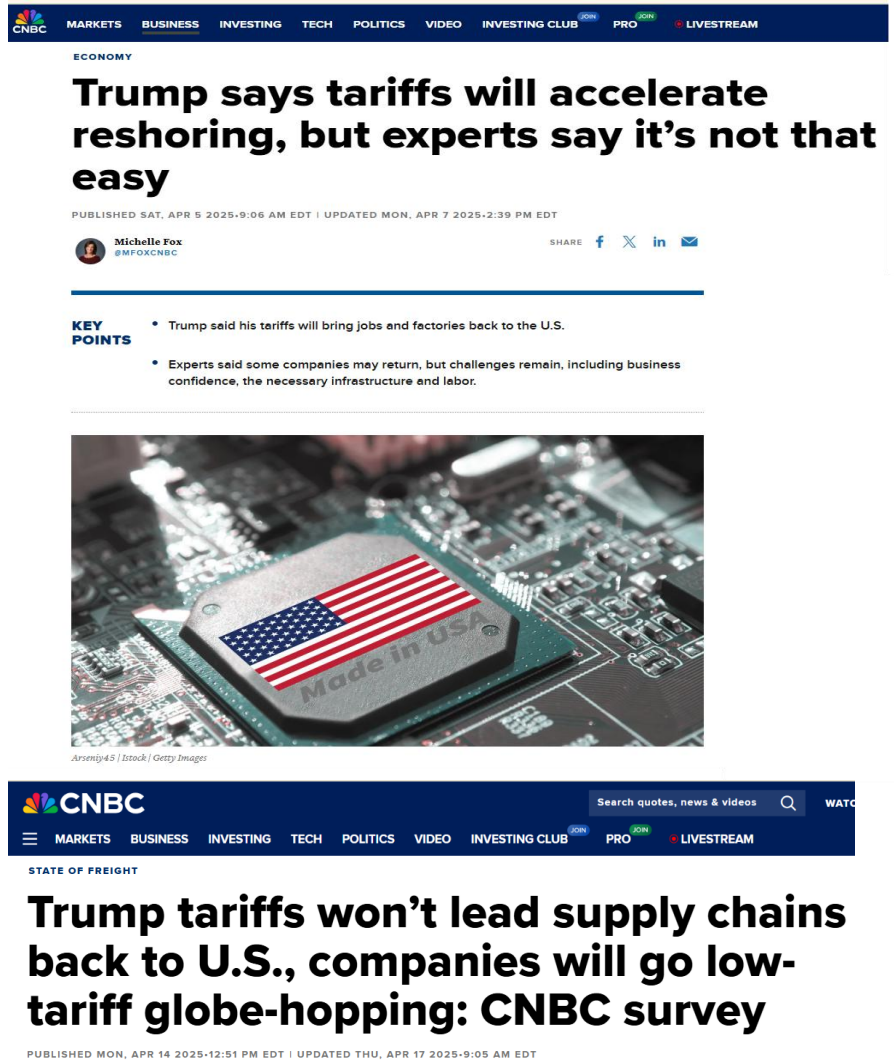
Industry Skepticism

A CNBC supply chain survey found that tariffs are unlikely to result in a significant U.S. manufacturing boom, citing high costs and the likelihood that companies will seek low-tariff regimes rather than reshore to the United States. This perspective highlights the challenges tariffs face in achieving comprehensive manufacturing reshoring.

Policy Response: Limitations of Reshoring

Back in 2018, Trump's targeted tariffs had little impact on reshoring or the return of jobs to the U.S. They had an adverse effect on manufacturers, who had to pay more for raw materials, with reduced demand and capacity in some cases. The US has made significant changes to its trade policy with the specific intent of bringing manufacturing home. So why haven't these policies resulted in an uptick in reshoring?

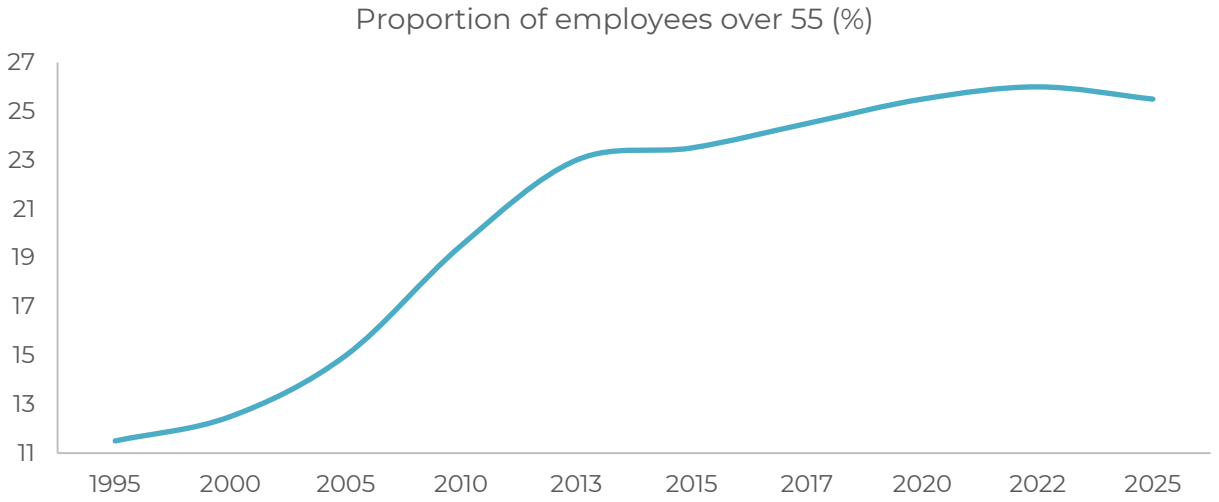
The answer lies in the complex supply chains. Supply chains, today, are spread across the globe. The North American auto industry is a good example, with individual components crossing the US border multiple times. Even in iPhone manufacturing, components are not made only in China but across many Asian countries. Re-aligning its supply chain with current US policy will be challenging and, in some cases, not possible to reshore. If reshored, the high cost of labor will only lead to possible automation in the assembly process, so how can we expect jobs to be created on US soil?

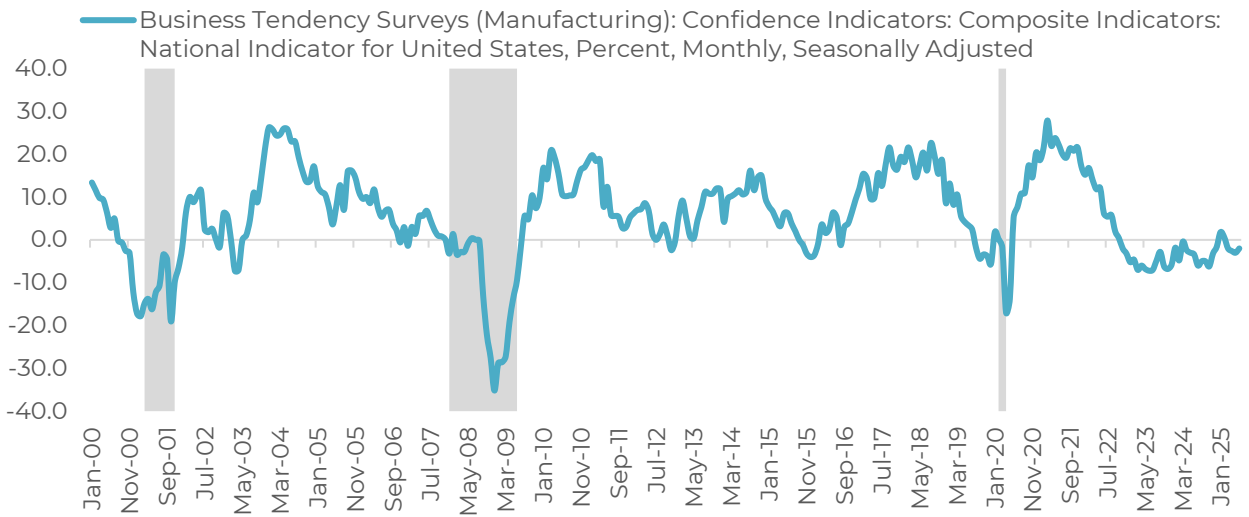


Source: Global Logistics Inc. (Reshoring in 2025: Why U.S. Manufacturing Is Making a Comeback), Kouvelis' Research on Trum 2018 tariffs and KTrade Research

US Manufacturing | Workforce Trends (1/2)

- **The U.S. manufacturing sector faces significant workforce challenges and opportunities, driven by technological advancements, demographic shifts, and evolving skill requirements. Addressing these trends is crucial for the continued growth and competitiveness of the industry.**





Skills Gap and Labor Shortages: A persistent skills gap and ongoing labor shortages are among the most pressing issues confronting U.S. manufacturing. Many manufacturing plants report that an insufficient labor supply or a lack of specific skills is a key constraint on operating at full capacity. Projections indicate that by 2030, an estimated 2.1 million manufacturing jobs could go unfilled if the skills gap is not adequately addressed. This deficit is not merely a matter of quantity but also quality, as the industry requires workers with advanced technical and digital skills to operate modern machinery and systems.

Aging Workforce and Generational Change: The manufacturing workforce is aging, with a significant portion of employees nearing retirement. Nearly 25% of the U.S. manufacturing workforce is over 55, and the gradual retirement of the baby boomer generation is exacerbating labor shortages. This demographic shift creates an urgent need to attract and retain younger talent to fill the impending skills gap and ensure knowledge transfer from experienced workers to the next generation. The challenge lies in making manufacturing careers appealing to younger generations, who may perceive the industry as outdated or lacking growth opportunities.

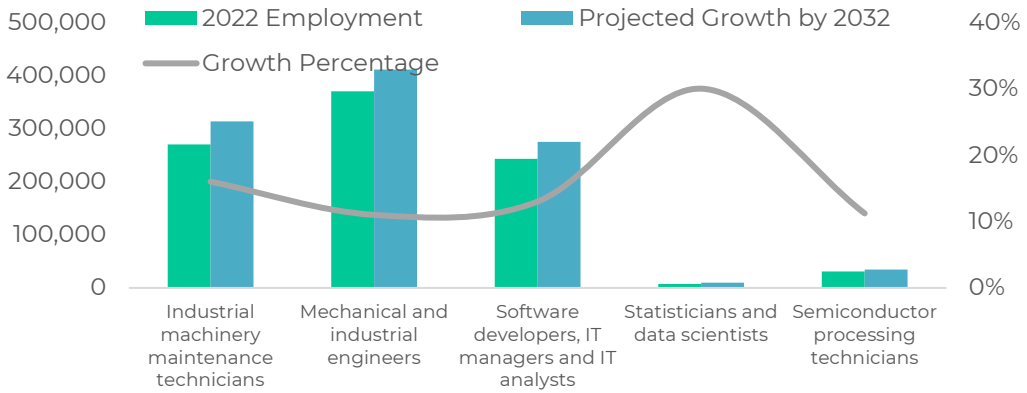
Reskilling and Training Need: To bridge the skills gap and adapt to technological changes, reskilling and upskilling initiatives are becoming imperative. Reskilling involves training employees for entirely new roles, often necessitated by the automation of traditional tasks, while upskilling focuses on enhancing existing skills to improve performance in current roles. The World Economic Forum estimates that by 2025, 50% of all employees will need reskilling due to the adoption of new technology.

Source: World Economic Forum and KTrade Research

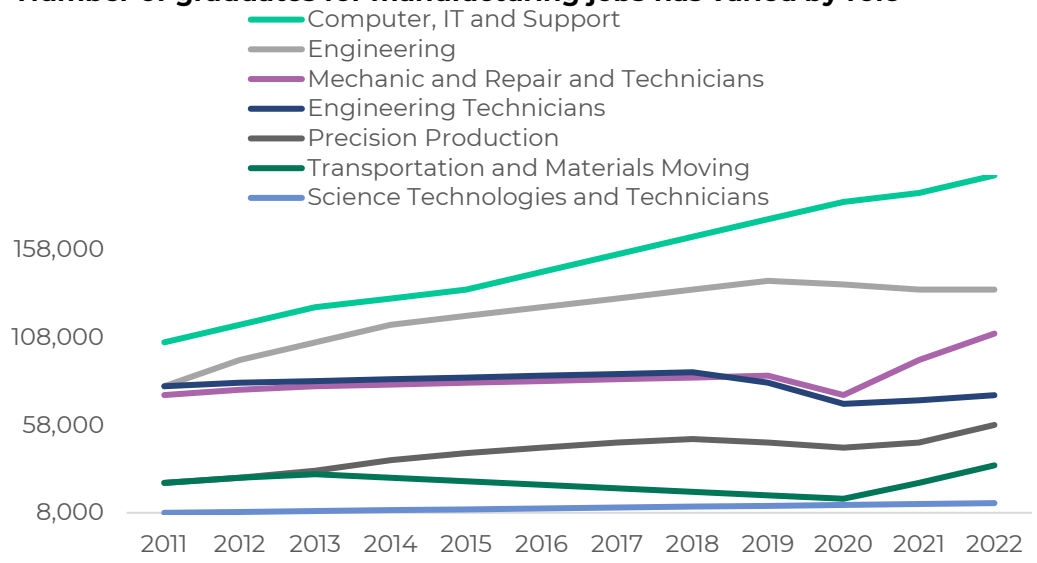
US Manufacturing | Workforce Trends (2/2)

- **manufacturing output has done better than manufacturing employment due to an increase in productivity, in part thanks to a move to higher-value manufacturing**

More manufacturing workers are likely to be needed for higher skill roles



Number of graduates for manufacturing jobs has varied by role



High-Skill Roles in Demand

- Fastest-growing manufacturing occupations through 2032 align with high-skill needs (linked to advanced tech, smart devices, systems integration).
- Roles like industrial machinery maintenance technicians (270,000 in 2022) could grow 16% by 2032.
- Mechanical & industrial engineers (370,000 in 2022) expected to grow 11%.
- Software developers, web developers, IT managers, and analysts (243,000 in 2022) could grow 13% by 2032.
- Statisticians & data scientists (currently 7,500 jobs) may grow 30% by 2032.

Production Roles Still Important

- Production-related occupations still make up the largest share of manufacturing jobs, expected to remain so in 2032.
- Growth is strongest in higher-skill production roles (semiconductor processing, machinists, supervisors, welders, electronics/electromechanical assemblers).
- Material-moving roles (laborers, industrial truck operators) are also expected to see gains.

Education & Training Gaps

- Traditional education may not keep pace with labor market needs.
- Bachelor's degrees awarded increased from 2011–2022, but degrees for high-skill trades stagnated.
- Certificates awarded (for skilled trades) increased moderately, with a big jump in 2021–2022, surpassing associate degrees.
- Degree programs relevant to the industry have seen substantial growth, particularly in computer science and engineering, while traditional manufacturing-focused programs like mechanics and repair technologies have declined.
- Certificate programs grew four times faster than associate degrees from 2011 to 2022; there's a concerning mismatch between available skilled graduates and industry needs.

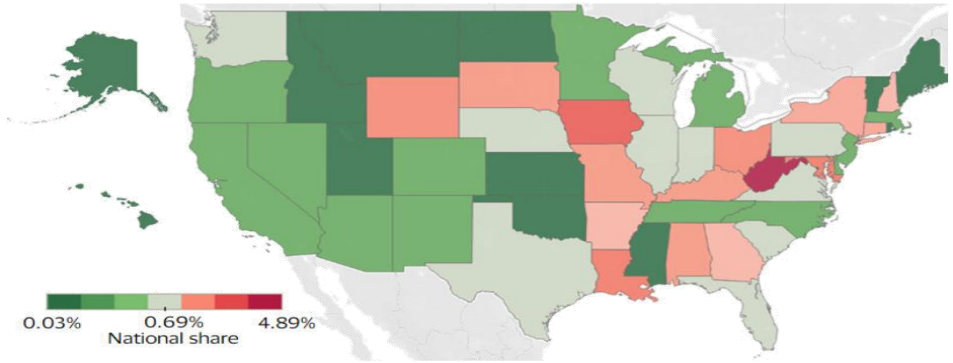
The U.S. manufacturing sector is shifting toward higher-skill, tech-integrated roles, while traditional production jobs remain crucial. However, education/training pipelines lag behind industry needs, particularly for skilled trades.

Source: Deloitte Taking charge: Manufacturers support growth with active workforce strategies and KTrade Research

US Manufacturing | Regional and Sectoral impact of tariffs

- **Recently announced 25 percent tariffs on all imported steel and aluminum are expected to have very disparate impacts Regionally, with high demand for both steel and aluminum in the manufacturing sector**

Tariffs' adverse effects likely will be felt more by states with a higher share of steel and aluminum imports



Sources: Visa Business and Economic Insights and U.S. Department of Commerce

Product-Specific Tariffs Summary

Targeted tariff measures on specific products:

- **Steel and Aluminum Tariffs (Section 232)**
  - 25 percent tariff on steel and 10 percent on aluminum, expanded in February 2025 to end all exemptions and raise aluminum tariffs to 25 percent
  - Rates doubled to 50 percent beginning June 2025 for all countries except the UK
  - Extended to cover steel content in eight more product lines including dishwashers, refrigerators, washing machines, dryers, freezers, stoves, ovens, and food waste disposals
- **Auto Tariffs**
  - 25 percent tariffs on autos and certain auto parts effective April 2025
- **Other Product-Specific Tariffs**
  - **Semiconductors and Pharmaceuticals**: Announced rates of "25 percent and higher" with a threatened 200 percent tariff on pharmaceuticals
  - **Copper**: 50 percent tariff announced for August 2025
  - **Apple**: Threatened with additional 25 percent tariffs if iPhone components aren't sourced from the US. Apple has already initiated reshoring process.

Regional Impact:

Tariffs tend to disproportionately affect regions with strong manufacturing and export bases tied closely to trading partners facing tariffs. For example:

- The Midwest and South regions see a greater negative impact due to their high demand for steel and aluminum and significant manufacturing activity, especially autos and heavy industry.
- States such as Michigan, Texas, and California tend to experience notable real income declines linked to tariff effects, while less globally integrated states like Colorado and Wyoming may see real income gains.
- The Northeast faces mixed outcomes with manufacturing sectors and construction job losses offset somewhat by financial and tech sector growth in metropolitan areas like New York and New Jersey.
- Geographically uneven effects reinforce existing economic disparities, with areas heavily reliant on manufacturing and exports to affected countries bearing the brunt.

Sectoral Impact from tariffs on steel and aluminum:

Construction: The largest consumer of steel in the US, using it for structural components like beams, rebar, and post-tension cables. Aluminum is also used extensively in building materials and infrastructure such as bridges and highways.

Automotive: This industry requires steel and aluminum for vehicle bodies, frames, and parts to balance strength and weight. Aluminum usage is growing, especially in electric vehicles, for battery enclosures and structural components due to its lightweight properties.

Aerospace: Uses high-quality, lightweight aluminum and steel for aircraft frames, engines, and related parts. Aluminum dominates due to its strength-to-weight ratio.

Appliance and Electronics Manufacturing: Steel and aluminum are critical in making household appliances (refrigerators, ovens, washing machines) and electronic devices.

Oil, Gas, and Utility Industries: Depend on steel and aluminum for pipelines, wires, and beams, critical for energy infrastructure**.**

Machinery and Tools Manufacturing: Steel is essential for durable machinery, industrial equipment, and tools across many manufacturing sectors.

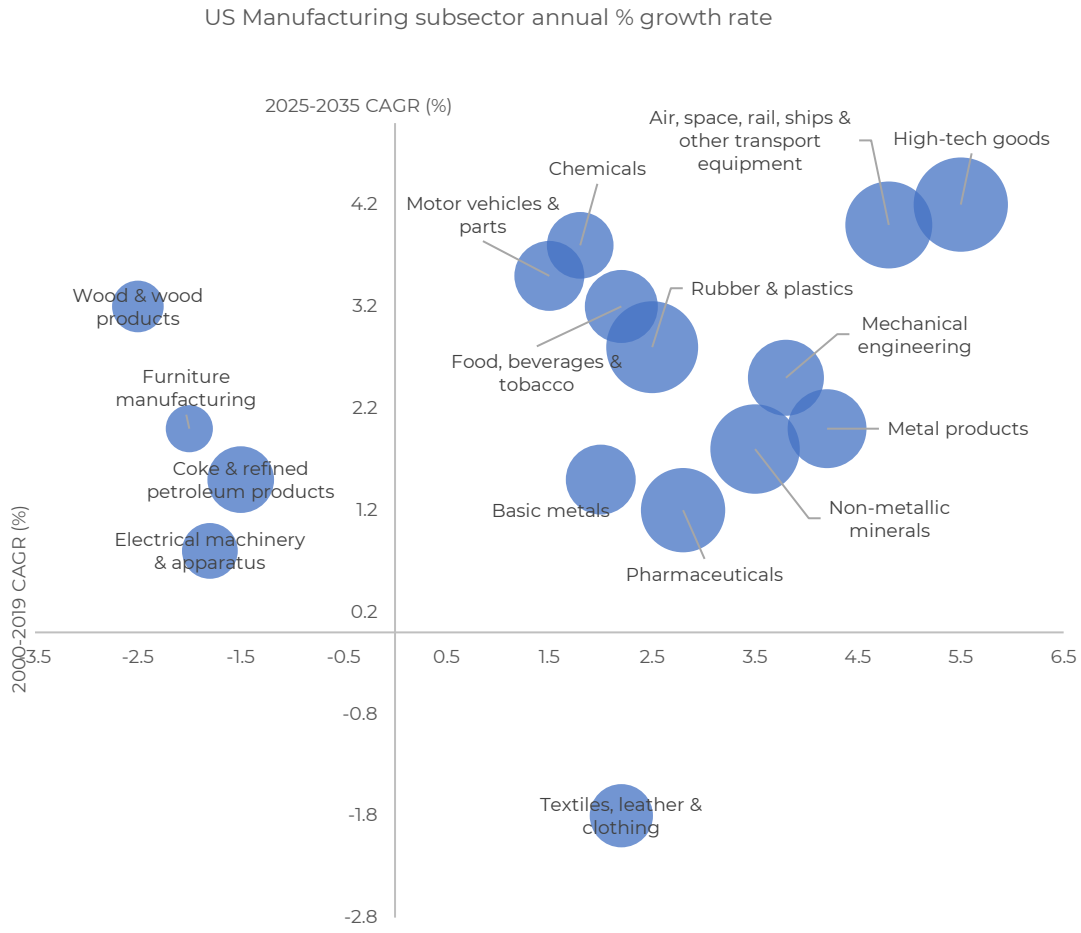
Packaging: Aluminum is widely used in packaging, including beverage cans, contributing to sustainability goals through recyclability.

Source: Tax Foundation 2025, Visa research Tariff troubles: Which regional economies could be affected?, Equitable Growth and KTrade Research

US Manufacturing | Regional and Sectoral Growth Potential

- **The U.S. manufacturing landscape is characterized by distinct regional strengths and emerging growth sectors, reflecting localized economic advantages and strategic investments. These highlights underscore the dynamic nature of American manufacturing and its adaptability to new market demands.**

High-tech goods, pharma, and aerospace will be among the fastest growing segments over the next decade



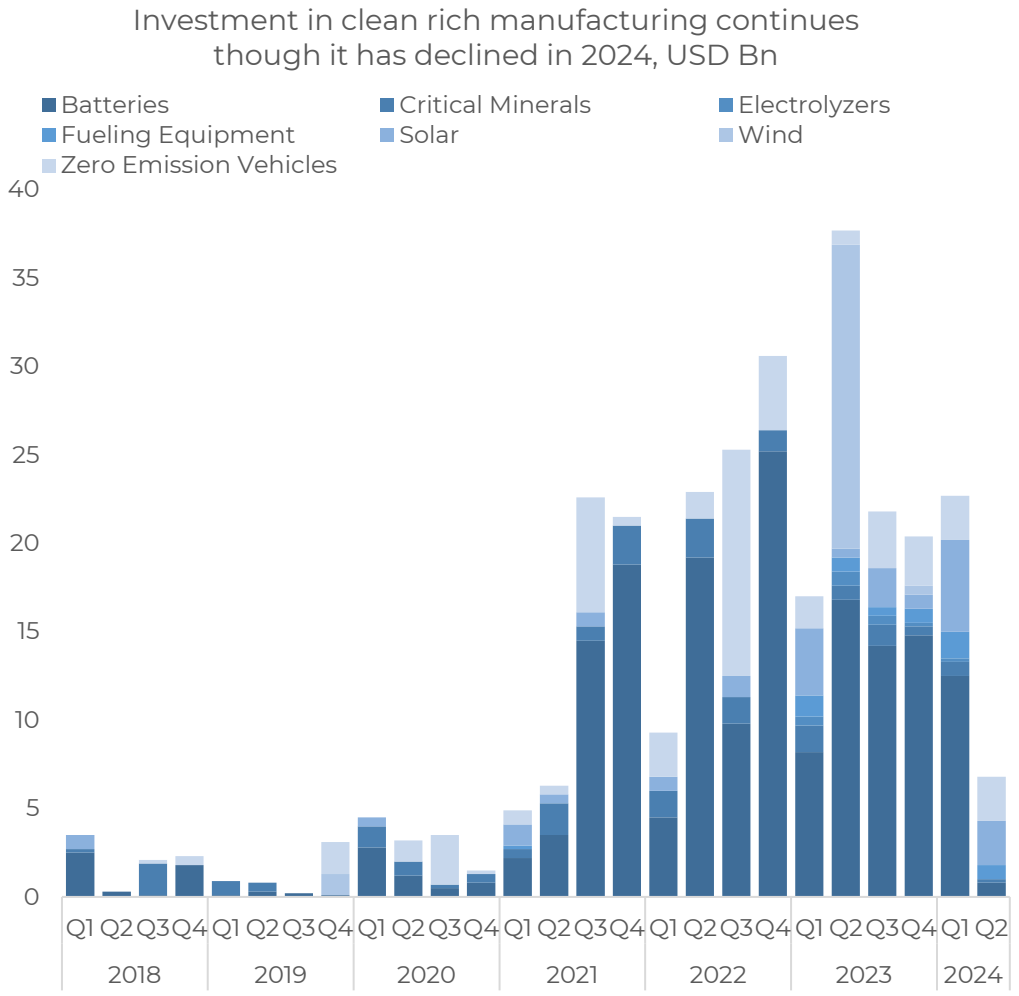
High-Performing Regions: While manufacturing is present across the U.S., certain regions stand out for their concentration and robust growth:

- **Midwest:** Historically the industrial heartland, the Midwest continues as a high-performing manufacturing region. States like Indiana, Iowa, Michigan, and Wisconsin have high concentrations of manufacturing employment, firmly rooted in industries such as automobiles, renewable fuels, and food products. The region is experiencing a resurgence, fueled partly by foreign direct investment.
- **South:** The Southern U.S. has emerged as a significant manufacturing hub, attracting new investments and experiencing strong growth in manufacturing payrolls. Southern states have become attractive manufacturing locations due to favorable business climates, available land, and a growing workforce.

Growth Sectors: Several sectors within U.S. manufacturing are experiencing significant growth:
High-precision tools and machining: Industries requiring extremely fine-tuned accuracy, such as aerospace and automotive, are expected to grow at over 6% CAGR through 2033, fueled by automation, AI integration, and smart factory development.
Advanced high-tech goods, pharmaceuticals, and aerospace: These sectors capitalize on the U.S.'s strong existing industrial base and technological innovation and are projected to be among the fastest-growing segments over the next decade
Precision turned product manufacturing: This sector is a fast-growing market driven by demand across automotive, aerospace, defense, electronics, and healthcare. Advancements like CNC machining, automation, and Industry 4.0 are key growth drivers.
Electric Vehicles: The automotive industry is undergoing a transformative shift towards electric vehicles. Investment in EVs, including battery production, is surging and revitalizing traditional automotive regions.
Semiconductors: Recognized as a strategic sector, this industry is critical to electronics and defense and is projected to continue growing.
Biomanufacturing: This emerging sector uses biological systems to produce materials, chemicals, and medicines, holding potential for innovation in healthcare, agriculture, and industrial processes.

Source: Oxford economics, Visual Capitalist and KTrade Research

US Manufacturing | Sustainability and Green Manufacturing



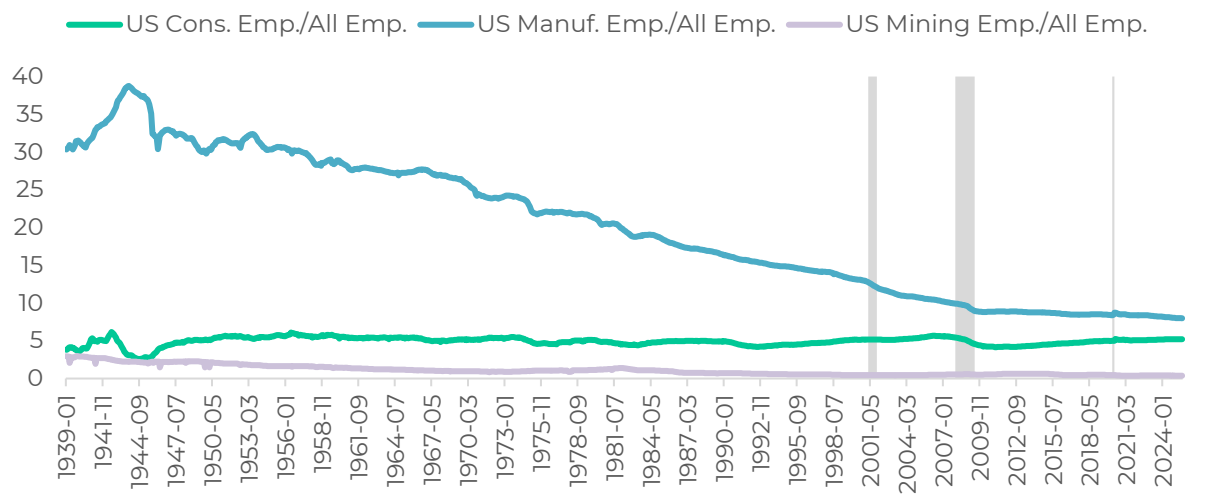
Harvard Scholar Insight (CSIS): Why It's Still Too Early for Manufacturing to Stay in the U.S. via Decarbonization: According to Elaine Buckberg in *"Not So Fast: Why U.S. Manufacturing Is Likely to Stay Home Through Decarbonization,"* energy costs, specifically electricity and natural gas, have had minimal influence on U.S. manufacturing output or employment since the early 2000s. Thus, even as energy becomes cleaner and cheaper, it doesn't necessarily shift manufacturing decisions, suggesting that decarbonization alone may not be sufficient to attract or retain manufacturing operations domestically.

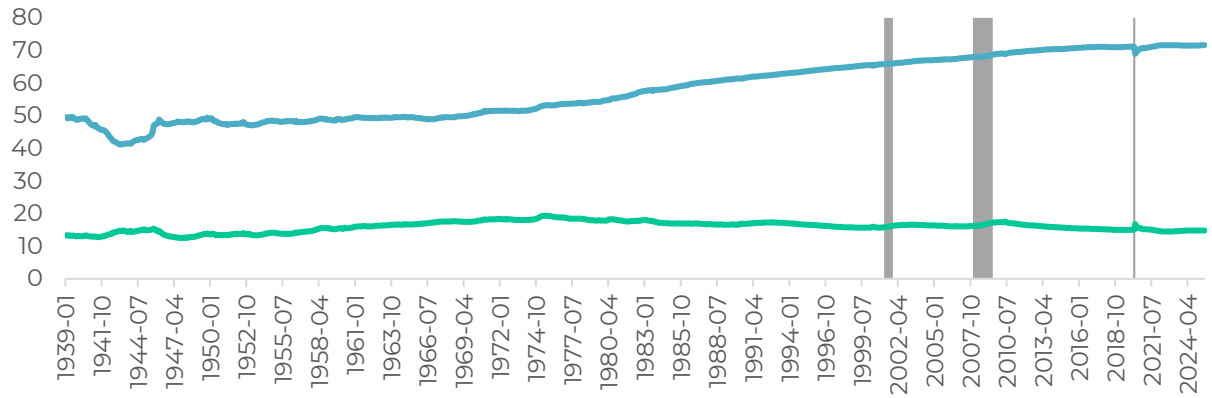
- **Pressure to Reduce Emissions:** Manufacturers across industries face mounting pressure from regulators, shareholders, and consumers to lower their carbon emissions. Federal initiatives are actively backing pilot programs and research efforts aimed at improving energy efficiency, adopting cleaner fuels, and deploying combined heat and power systems.
- **Circular Economy and Sustainable Materials:** Advanced manufacturing is shifting toward circular economy models, emphasizing longevity, repairability, and recyclability. This approach promotes closed-loop material use, reduces waste, and strengthens supply chain resilience through DOE and NSF-supported frameworks.
- **Electrification and Clean Energy Use in Factories:** A major driver of decarbonization, electrifying industrial processes, particularly heating, and integrating clean energy sources, offers substantial emissions reductions and long-term cost advantages. Policymakers, utilities, and regulatory frameworks increasingly support such transitions.

Source: CSIS (Not So Fast: Why U.S. Manufacturing Is Likely to Stay Home Through Decarbonization), Deloitte Research Center for Energy & Industrials: 2025 Manufacturing Industry Outlook and KTrade Research

US Manufacturing | Can Tariffs Reinvigorate American Manufacturing?

- **Cyclical fluctuation in number of employees in manufacturing with a big decline in the first decade of the 21st century.**
- **Manufacturing employment have steadily declined as a share of total industry employment**





Historical Context:

- Kouvelis' research on Trump's 2018 targeted tariffs found that they did not have a big impact on reshoring or the return of jobs to the U.S.
- He said there was an adverse effect for manufacturers, who had to pay more for raw materials, with reduced demand and capacity in some cases.

Employees in Manufacturing have been historically declining

- Historically, economic development has led to a declining share of workers in goods-producing sectors. The first sector to decline is agriculture,* whose workers moved to manufacturing and mining during the Industrial Revolution (which pre-dates our graph by a century or so). In the 19th century and beyond, the U.S. economy grew further and progressed to the next phases of development, with mining and manufacturing losing relative importance.
- So if the U.S. economy is growing, where is it growing? The graph below shows that the service sector has taken up the slack. At the start of the graph, in 1939, this sector had already made up 50% of non-farm employees, and it has continued to grow. The remaining sector, government, has remained relatively flat over the 80 years of this data series. Clearly, the U.S. economy is now much less focused on "making things." Rather, the emphasis is now on education, health, leisure, retail, information, and finance.

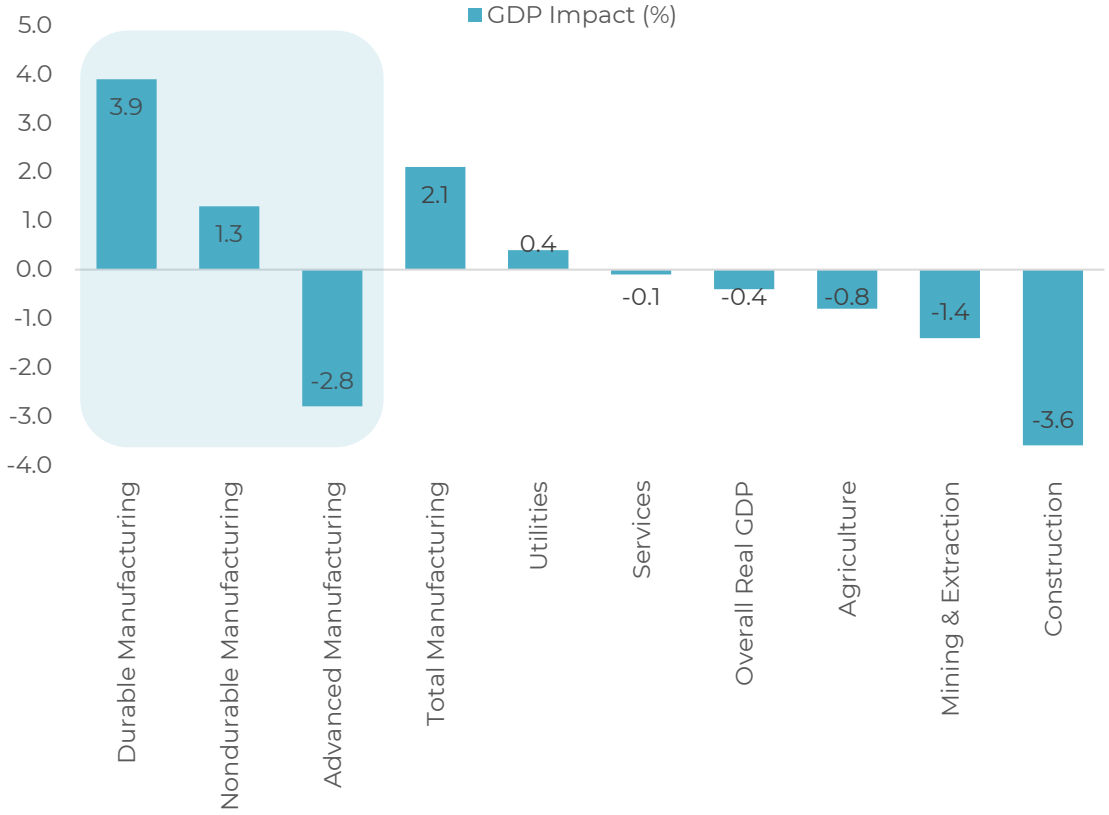
The tariffs are a response to the persistent trade deficit. In order to curtail this deficit, the Trump administration wants to impose taxes on imports, hoping that US manufacturing will return to the United States. However, the data indicate that this is not quite feasible. In fact, the US economy has evolved into a more services-based economy, moving away from being a fundamentally manufacturing-based economy.

Source: Flexibility Value of Reshoring Capacity under Policy Uncertainty and Domestic Competition, Wash. Uni. in St. Louis, The FRED Blog - Is the decline in manufacturing economically "normal"? and KTrade Research

US Manufacturing | Effectiveness of Tariffs on US Manufacturing (1/2)

- **Long-Run Sectoral GDP & Employment Effects: In the long-run, tariffs present a trade-off. US manufacturing output expands by 2.1% , but these gains are more than crowded out by other sectors: construction output contracts by 3.6% and agriculture declines by 0.8%.**

Change in Long-Run Real U.S. GDP by Sector from 2025 Tariffs. U.S. tariffs implemented through August 6, plus foreign retaliation Percentage Points. Advanced manufacturing is down by 2.8%, mainly due to supply chain disruptions and increased input costs.



Winners: Durable Manufacturing (+3.9%), Total Manufacturing (+2.1%), Nondurable Manufacturing (+1.3%)

Biggest Losers: Construction (-3.6%), Advanced Manufacturing (-2.8%), Mining & Extraction (-1.4%)

Overall Impact: Real GDP decreases by 0.4 percentage points

Long-run US Sectoral Output & Employment Effects

Tariffs shrink the overall size of the US real economy in the long run by 0.41%, but beneath aggregate GDP, they also drive reallocation across US sectors. Long-run output in the manufacturing sector expands by 2.1% under the tariffs, with non-advanced durable manufacturing output 3.9% larger and nondurable manufacturing 1.3% larger. However, advanced manufacturing is down by 2.8%. This was mainly due to supply chain disruptions and increased input costs. Moreover, the expansion of the overall manufacturing sector crowds out the rest of the economy: construction by 3.6%, agriculture by 0.8%, and mining & extraction by 1.4%.

Tariff Effectiveness and Economic Impact

The debate over whether tariffs can effectively bring manufacturing back to the United States reveals mixed evidence and perspectives. Tariffs have shown some success in promoting domestic production in specific sectors. President Biden doubled tariffs on solar panels in 2024, recognizing their effectiveness in boosting domestic production, indicating bipartisan recognition of tariffs as a policy tool.

However, economic analysis presents a more complex picture. According to Yale's Budget Lab analysis, while tariffs can expand U.S. manufacturing output by 2.1% in the long run, these gains are offset by contractions in other sectors, with construction output declining by 3.6% and agriculture by 0.8%. The overall economic impact shows the U.S. economy being persistently 0.4% smaller in the long run, equivalent to $125 billion annually in 2024 dollars.

Labor Market Effects

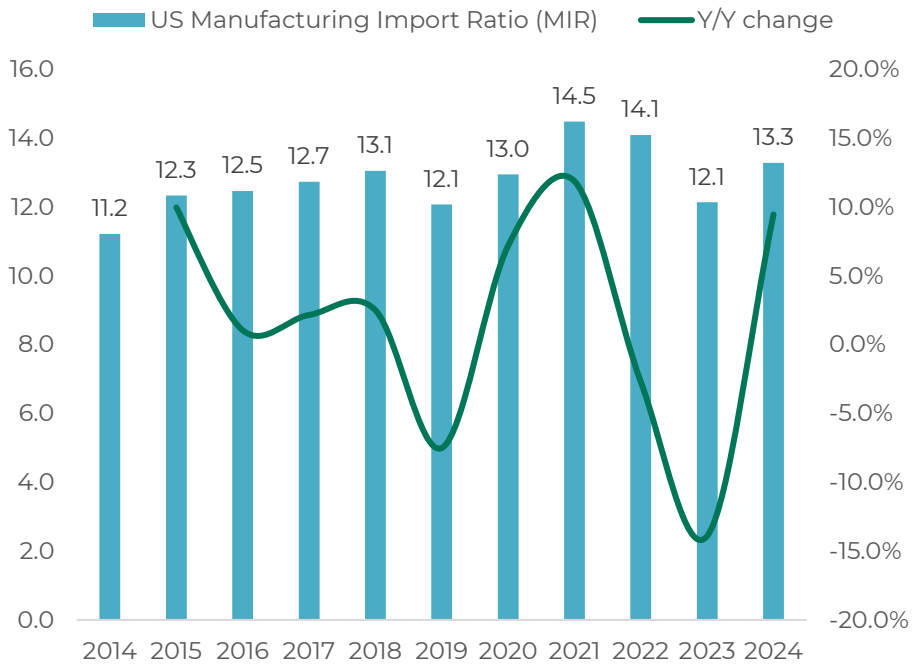
Tariff implementation presents trade-offs in employment. While manufacturing jobs may increase, the unemployment rate is projected to rise by 0.3 percentage points by the end of 2025 and 0.7 percentage points by 2026, with payroll employment being 505,000 lower by the end of 2025. This suggests that job creation in manufacturing may not fully offset job losses in other sectors.

Source: Yale Budge lab and KTrade Research

US Manufacturing | Effectiveness of Tariffs on Reshoring US Manufacturing (2/2)

- **Kearney's 2025 Reshoring Index Declines by 311 Points, Providing a Reality Check on US Manufacturing Readiness. Key challenges prevail such as costs, skills gap, supply chain, and investment requirements.**

The decrease in 311 bps in the Reshoring Index reflects a 9.5% change in US Manufacturing Import Ratio (MIR)



- The manufacturing import ratio increased by 9%, back to pre-COVID levels, as imports from 14 Asian low-cost countries and regions (LCCRs) grew faster than US domestic manufacturing output. This led the Reshoring Index to decline by 311 basis points. "This reversal shouldn't be seen as evidence that reshoring strategies are necessarily doomed, but it ought to serve as a very serious reality check," adds Van den Bossche (Partner at Kearney).

Challenges in Manufacturing Reshoring

- **Cost Competitiveness:** One of the primary obstacles to successful reshoring is cost competitiveness. U.S. wage rates, regulatory compliance requirements, permitting delays, and litigation risks continue to make reshoring more expensive than offshore locations such as China, Vietnam, and India.
  - Policy volatility adds investment risk: Firms are wary of investing in domestic plants that could become uncompetitive if tariffs or incentives are swiftly reversed.
  - Shift toward friend-shoring: Bank of America reports that reshoring peaked in 2022. Many firms now prefer relocating to friendly, lower-cost nations (e.g., Mexico, Vietnam) due to affordability, skilled labor, and regulatory stability. U.S. manufacturing costs remain significantly higher than those in many overseas locations, particularly in Asia. This cost differential extends beyond labor costs to include regulatory compliance, environmental standards, and infrastructure expenses.
- **Skills Gap and Workforce Challenges:** The manufacturing sector faces persistent skills shortages that complicate reshoring efforts. A shortage of skilled labor has left over 600,000 U.S. manufacturing jobs unfilled as of early 2025. Retirements and weak training pipelines exacerbate the talent gap. Years of manufacturing decline have eroded the industrial skills base, creating challenges in finding qualified workers for modern manufacturing operations. This skills gap represents a significant bottleneck for companies attempting to reshore production.
- **Supply Chain Integration:** Decades of global supply chain development have created complex networks of suppliers and partners that cannot be easily replicated domestically. Companies often find that while they can reshore final assembly, they remain dependent on overseas suppliers for components and raw materials, limiting the full benefits of reshoring.
- **Infrastructure and Investment Requirements:** Successful reshoring often requires substantial infrastructure investments and capital expenditures. Companies must invest in new facilities, equipment, and technology, which can be cost-prohibitive and time-consuming. The lengthy payback periods associated with these investments can discourage reshoring initiatives.
  - Examples include:
    - Hyundai's EV plant in Georgia: $12.6 billion, 2.5 years to complete.
    - Volvo's S.C. facility: $1.35 billion, three years to production.
    - Pharmaceutical plants: Typical build times are 3 years; biologics facilities may require up to 5 years.

Source: Kearney report in US manufacturing, Kearney 2025 Reshoring Index, Financial Times and KTrade Research

US Manufacturing | Reshoring Policies on Global Supply Chains (Impact on Global South)

- **US reshoring policies targeting intermediate goods could put 5-15% of Global South export value at risk, with countries like Vietnam, India, Mexico, South Africa, and Nigeria facing significant trade disruptions due to their heavy reliance on exporting intermediate products to US manufacturing supply chains**

With the US reshoring targets and tariff policies, a significant portion of the Global South's export value is at risk. According to ODI Global research paper on the impact of US Tariffs and reshoring policy, low- and middle-income countries (L&MICs), especially the Global South:

- A reshoring rate of 5% to 10% of goods imported by the U.S. for further processing could cause a 5.3% to 13.3% reduction in global trade compared to the baseline. This trade contraction is especially impactful for export economies in the Global South, highly integrated into supply chains supplying intermediates to the U.S. manufacturing sector.
- Countries like Vietnam, India, Mexico, South Africa, and Nigeria are already feeling the adverse effects due to tariffs on steel, aluminum, and other inputs, which have caused disruptions in their export-based growth sectors. Many of these countries depend on the export of intermediate and semi-finished goods, making them particularly vulnerable.
- Due to the complexity of global value chains, many U.S. imports contain intermediate inputs sourced from various Global South countries, meaning reshoring would diminish demand across multiple linked economies, not just direct U.S. exporters.
- In 2016, the Global South accounted for over 47% of global manufacturing exports. With the US-China trade tensions and reshoring, many Global South countries face risks to their export volumes and values, especially for intermediate goods essential to U.S. manufacturing.
- The global South's export dependence on intermediate goods makes these economies structurally sensitive to U.S. reshoring policies. Some countries may face trade losses of 5% to 15% of export value if significant reshoring targeting intermediate goods occurs.

In summary, the U.S. reshoring efforts target intermediate goods ; a substantial portion of the Global South's export value — estimated at 5% to 15% — is at risk due to declining demand, tariff impacts, and supply chain realignments affecting multiple developing economies integrated into U.S. manufacturing supply chains. If U.S. reshoring targets intermediate goods, it puts a substantial portion of the Global South export value at risk. Studies estimate that reshoring just 5% to 10% of the U.S.'s imported intermediate goods could reduce global trade by 5.3% to 13.3% relative to baseline levels. Since many Global South countries, such as Vietnam, India, Mexico, South Africa, and Nigeria, rely heavily on exporting intermediate and semi-finished products to the U.S., their export volumes and values could decline significantly. In 2016, the Global South accounted for over 47% of global manufacturing exports, with much of this tied to intermediate goods. Therefore, a U.S. reshoring move targeting intermediates could threaten 5% to 15% of export value for developing economies in the Global South, impacting their trade-based growth and integration into global value chains.

Cases:

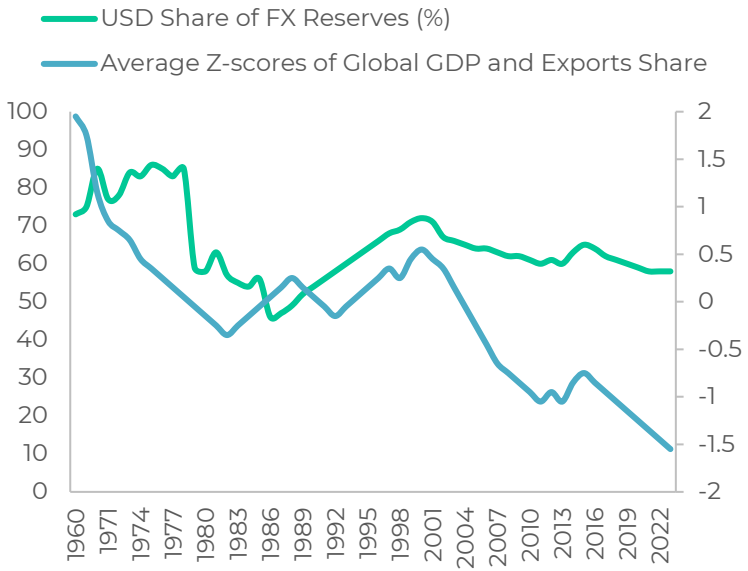
- **Vietnam (46% tariff):**
  - Faces the most severe impact with potential loss of $62.8 billion in exports
  - Risk of losing nearly all US market share in key sectors (electronics, textiles, machinery, footwear)
  - Six major export categories representing 74% of total exports are under threat
  - May need to negotiate tariff reductions to avoid economic devastation
- **Bangladesh (37% tariff):**
  - Garment industry, which employs 4 million workers and represents 80% of export earnings, is severely threatened
  - Exports worth $7.34 billion in textiles alone face major challenges
  - Potential for significant job losses and economic downturn
  - May lose market share to competitors like India and Pakistan
- **India (26% tariff) - Still Under negotiations:**
  - Projected $15 billion decline in exports (0.4% of GDP)
  - Mixed impact: gems/jewelry and electronics sectors face challenges
  - However, pharmaceuticals exempted from tariffs, creating opportunities
  - May gain relative advantage in textiles over China (which faces 34% tariffs)

Source: ODI Global Research paper (Vulnerability of low- and middle-income countries to the impacts of aid cuts and US tariff increases) and KTrade Research

US Manufacturing | Reshoring & USD Dominance (A Structural Contradiction)

- **The Triffin Dilemma illustrates the fundamental conflict for the country issuing the world's reserve currency (the US) between supplying global dollar liquidity by running persistent trade deficits and protecting its own domestic economy, including its manufacturing base, by reducing deficits.**

The dollar's share in FX reserves has declined in tandem with its macro footprint



> *"Today, a large and growing proportion of energy is being priced in non-dollar-denominated contracts."*

Natasha Kaneva
Head of Global Commodities Strategy, J.P. Morgan

Structural Contradiction of US Manufacturing Reshoring and the USD Dominance

The current economic dynamics reveal an inherent contradiction between America's dual objectives of industrial revival and maintaining dollar hegemony - a conflict that economists recognize as the Triffin Dilemma.

The Triffin Dilemma

The Triffin Dilemma, formulated by economist Robert Triffin in the 1960s, highlights an inherent contradiction for countries issuing the world's reserve currency. The United States faces an impossible choice between two conflicting objectives:

- **Global Financial Leadership**: To maintain international trust in the dollar, the US must run trade deficits and supply the world with dollar liquidity, keeping the currency strong and stable to attract global savings and sustain Treasury purchases.
- **Domestic Manufacturing Revival**: To rebuild its industrial base, the US needs competitive exchange rates to boost exports, which requires running trade surpluses and reducing dollar outflows, directly contradicting the first objective.

Structural Barriers to Reindustrialization:

- **Currency Constraints**: Manufacturing economies typically require competitive exchange rates to boost exports, but the dollar's reserve status demands strength and stability. Dollar strength makes US exports expensive and undermines domestic production competitiveness, creating a structural impediment to industrial revival.
- **Labor Market Reality**: The United States lacks the demographic foundation for a large-scale manufacturing revival, characterized by an aging population and a shrinking blue-collar workforce.

Declining Dollar Dominance

Current monetary trends indicate a gradual erosion of dollar privilege:

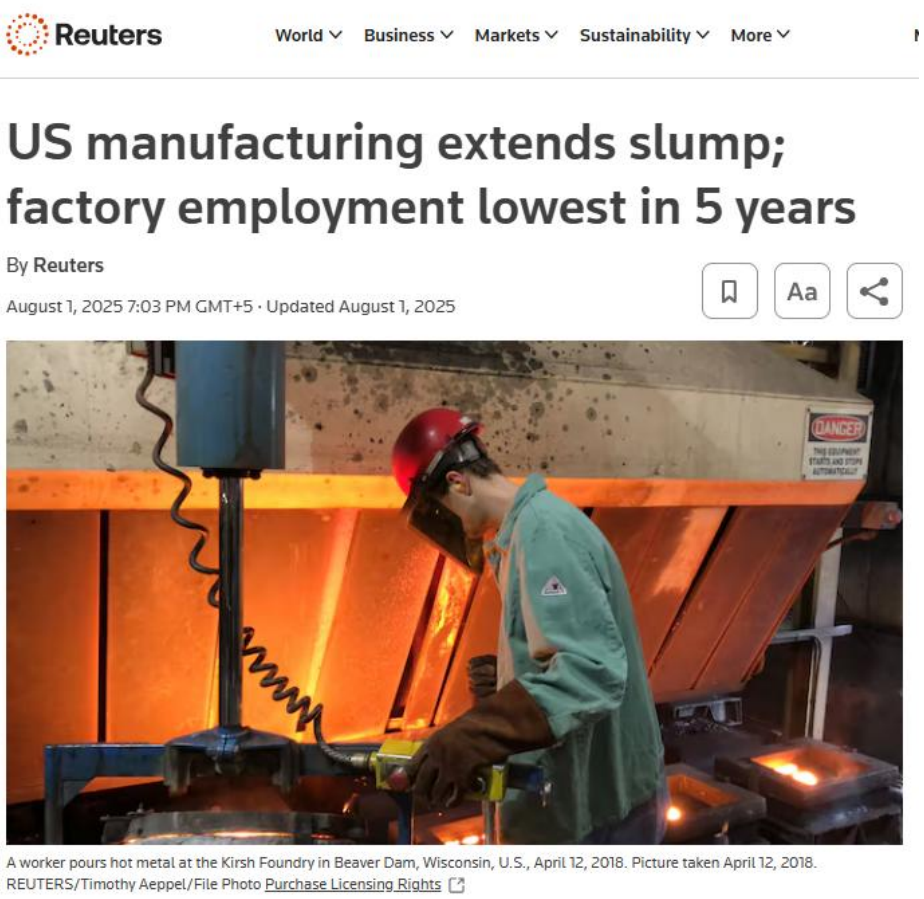
- The dollar's share of global reserves has declined from 71% in 1999 to approximately 58% today.
- Central banks across Asia, Africa, and Latin America are increasing exposure to euros, gold, and Chinese yuan.
- China's CIPS payment system, growing yuan-denominated trade agreements, and increased usage of local currencies in BRICS and ASEAN transactions demonstrate diversification away from dollar dependence.

The Fundamental Choice

The US cannot resolve this tension through incremental policy adjustments, as the Kovel's contradiction is structural rather than cyclical. Washington ultimately faces a binary choice between maintaining its role as a financial empire or becoming a competitive manufacturing economy. The economic dynamics indicate these objectives are fundamentally incompatible within the current global monetary framework, suggesting that America's industrial revival ambitions may require sacrificing its privileged position in the international financial system.

Source: Triffin Dilemma and the Limits of American Reindustrialization by Muhammad Asif Noor (Founder of Friends of BRI Forum), JP Morgan Global Research - De-dollarization: Is the US dollar losing its dominance? and KTrade Research

US Manufacturing | Sector Outlook (Reshoring challenges) and Global Economic Dynamics



Sector Outlook and Reshoring Challenges

The U.S. manufacturing outlook is weak, as capital expenditure is declining, which will likely suppress investment and hinder reshoring efforts. Companies are holding back on production amid persistent uncertainty over Trump-era tariffs, making planning extremely difficult.

Flat Revenue Outlook & Shrinking CapEx (Reshoring challenges): U.S. manufacturing revenue is projected to grow by only 0.1% in 2025, a sharp decline from the 4.2% forecast in December 2024 and the 0.8% realized last year. Raw material prices are expected to surge by 7.5%, mainly due to the Trump administration's tariff policies. Response to cost pressures and uncertainty: capital expenditures (CapEx) are now expected to decline by 1.3% this year, reversing earlier expectations of a 5.2% increase.

Many firms have paused new investments, delaying the industry's revival, and the earliest anticipated recovery is now expected in 2026 (ISM Economic Forecast).

Global Economic Uncertainty and Trade Dynamics

The state of the global economy remains highly uncertain, with significant question marks surrounding U.S. tariff policies and their potential impact on global GDP and major emerging economies. The Trump administration is poised to introduce significant changes to the industry, impacting sectors ranging from chipmakers to food producers. This uncertainty creates a challenging environment in which smaller economies must adjust, given their limited negotiating power in evolving trade relationships.

The dominance of the USD faces increasing scrutiny from BRICS nations, which account for 40% of the world's population and over 25% of global GDP. The BRICS Cross-Border Payment Initiative aims to reduce dollar dependence through national currencies, though analysts agree the USD's reserve status will likely persist for decades.

Source: ISM Forecast, Manufacturing Drive (Tariffs push manufacturing into stagnation through 2025: ISM forecast) & Ktrade research

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