

Operations Practice

# Delivering the US manufacturing renaissance

The stage is set for a manufacturing resurgence in the United States. Can the country's producers make it happen?

*This article is a collaborative effort by Tyler Carr, Eric Chewning, Mike Doheny, Anu Madgavkar, Asutosh Padhi, and Andrew Tingley, representing views from McKinsey's Operations Practice and the McKinsey Global Institute.*



**US manufacturing may be poised** for an overhaul and a rebound, with a potentially significant impact on the nation's overall economy. In the United States, manufacturing accounts for \$2.3 trillion in GDP, employs 12 million people, and supports hundreds of local economies. Although that represents just 11 percent of US GDP and 8 percent of direct employment, the sector makes a disproportionate economic contribution, including 20 percent of the nation's capital investment, 35 percent of productivity growth, 60 percent of exports, and 70 percent of business R&D spending (Exhibit 1).<sup>1</sup>

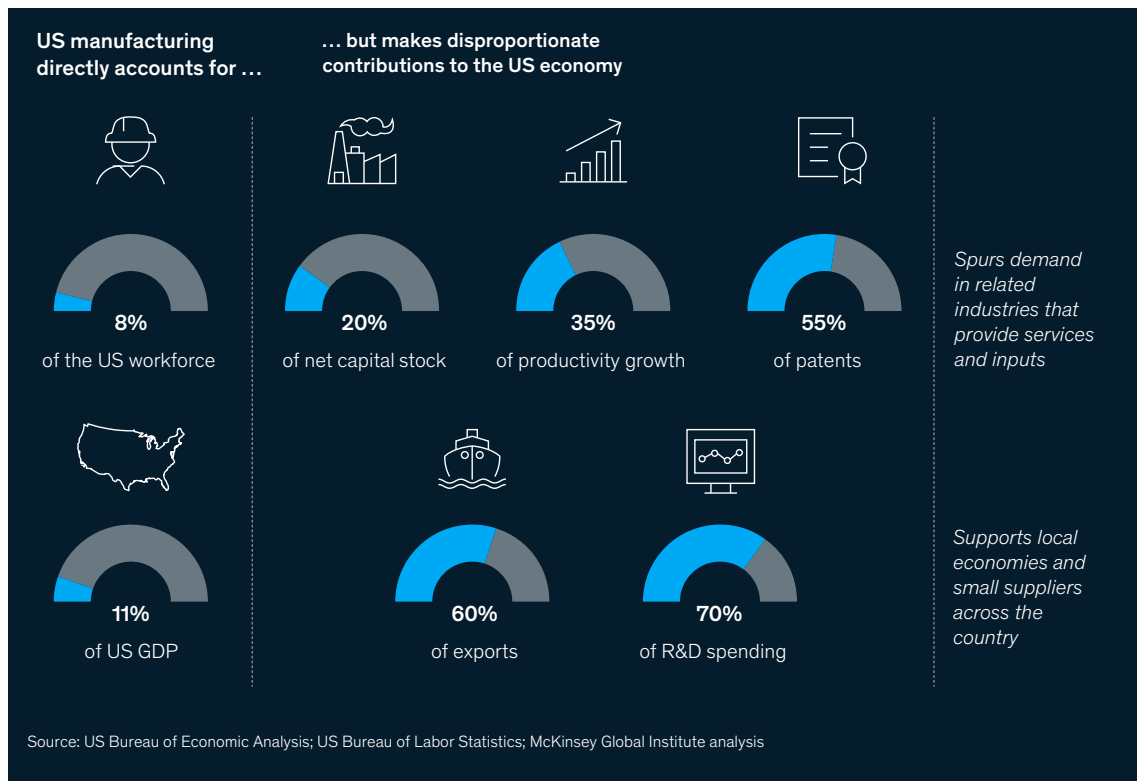
of global manufacturing GDP and gross sales have fallen. In real value-added terms, growth in the sector has slowed dramatically over the past three business cycles, from 4.9 percent in the 1990s to 1.4 percent in each of the past two decades. And much of that recent growth has been driven by design, services, and software activities, rather than by physical production.<sup>2</sup> The number of manufacturing firms and manufacturing plants in the United States has fallen by roughly 25 percent since 1997, reflecting an increase in closures and a slowdown in start-ups.

In recent decades, the United States has seemed in danger of losing its position as a world-leading manufacturing economy. While absolute output has grown during the 21st century, the US shares

Some recent trends point to the potential for a resurgence of growth, especially if manufacturers take a few key measures to strengthen their position in the market.

Exhibit 1

### Manufacturing creates outside economic impact in the United States.



<sup>1</sup> For more information, see "Building a more competitive US manufacturing sector," McKinsey Global Institute, April 15, 2021.

<sup>2</sup> Ibid.

## Ready for lift off?

Today, US manufacturing has reached an inflection point. The decade leading up to the COVID-19 crisis saw the sector recover some of its earlier declines: 1.3 million manufacturing jobs were added to the economy between 2010 and 2019, following the loss of 5.8 million jobs over the previous ten years. The country's share of global manufacturing GDP, output, and exports also stabilized.

Accelerating that upturn could have transformative economic and social effects while improving the resilience of the wider economy. Analysis by the McKinsey Global Institute suggests that restoring growth and competitiveness in key manufacturing

industries could boost US GDP by more than 15 percent over the rest of the current decade (Exhibit 2).

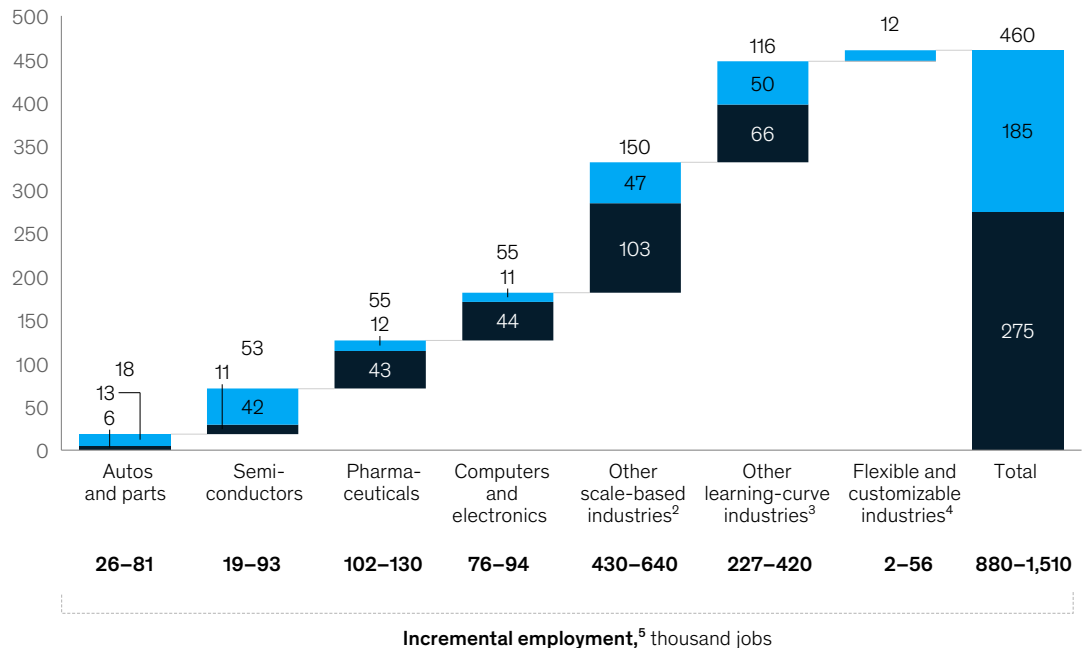
A strong manufacturing economy unlocks important employment and advancement opportunities—a factor set to grow in significance if current job market pressures ease. Manufacturing is the main economic engine and primary employer in around 500 US counties today, and in those communities, the industry employs a broader-than-average swath of the overall population and does so more inclusively. In most cases, employees don't need four-year degrees, and they can earn twice as much as those holding equivalent service-sector jobs, as

Exhibit 2

## An effective transformation of the US manufacturing sector could boost GDP by \$275 billion to \$460 billion while adding up to 1.5 million jobs.

Incremental 2030 GDP opportunity,<sup>1</sup> \$ billion (index 0 = 2020)

■ Low-end opportunity ■ Additional optimistic opportunity



Note: Figures may not sum to 100%, because of rounding.

<sup>1</sup>Above 2030 IHS forecast. <sup>2</sup>Basic metals, electrical equipment, fabricated metals, general machinery, petrochemicals, specialty chemicals. <sup>3</sup>Communications equipment, medical devices, precision tools, special-purpose machinery. <sup>4</sup>Aerospace and defense equipment, railroad and maritime equipment. <sup>5</sup>Includes direct jobs within each industry and indirect jobs in other sectors.

Source: IHS Markit (January 2021 forecast); OECD; McKinsey Global Institute analysis

employers invest in upskilling and reskilling their current workers by offering expanded learning opportunities. Our analysis suggests that reviving manufacturing could add up to 1.5 million jobs, particularly among middle-skill workers, which would help recalibrate the US labor market and bolster the middle class.

Strengthening the sector could also address the supply chain issues that have been wreaking economic havoc over recent years, easing disruptions caused by the pandemic while improving global competitiveness in the mid to long term. Between 2010 and 2019, the US trade deficit in manufactured goods more than doubled, reaching \$883 billion. The country currently meets 71 percent of its final demand with regional goods, trailing Germany (with 83 percent), Japan (86 percent), and China (89 percent). Increased import dependence has left some key US manufacturing supply chains exposed to greater global risks.<sup>3</sup> The supply chain shocks of the past three years have pushed those risks to the top of the corporate agenda: in surveys, more than 90 percent of senior executives tell us that increasing the level of resilience in their supply chains is a priority.

Many government officials are also acutely aware that the decline of the US manufacturing industry has contributed to rising inequality and hurt the country's global competitiveness. They see the revitalization of manufacturing as imperative for sustainable and inclusive growth and are set to commit significant public capital to that end. The Bipartisan Infrastructure Law,<sup>4</sup> for example, directs the investment of billions of dollars into US manufacturing capacity.

## **Manufacturing is changing**

Any reinvigoration of US manufacturing will also require reinvention. Around the world, companies are taking a fresh look at the paradigms that have

dominated the industry's evolution for decades, with the aim of making manufacturing more sustainable, more digital, more skilled, and more resilient.

### **More sustainable**

Manufacturing has relied on fossil-fuel energy since the First Industrial Revolution. Now governments, customers, and investors are demanding that the sector embrace a more sustainable approach while also remaining cost-competitive. Switching to low-carbon sources will be technically and economically challenging, especially for energy-intensive heavy-industrial sectors. But the energy transition also offers significant opportunities for US manufacturers. Demand for new renewable-energy generation equipment is set to skyrocket, for example, with capacity expected to increase fourfold by 2050. And the Bipartisan Infrastructure Law is expected to trigger \$5 billion in investment in new charging infrastructure for electric vehicles.

### **More digital**

Leading manufacturers are now applying digital technologies at scale in their operations. The 103 Industry 4.0 pioneers that make up the Global Lighthouse Network (GLN), a World Economic Forum initiative in collaboration with McKinsey, are reporting significant results from these digital investments. GLN sites are achieving meaningful KPI improvements along multiple fronts at once: in sustainability, such as greenhouse-gas emissions; productivity, such as factory output; agility, such as shorter order-to-delivery lead times; speed to market; and customization (Exhibit 3).<sup>5</sup>

Around the world, manufacturers are ramping up their investment in key technology areas, seeking to overcome existing pain points in their operations, improve their product and service offerings, or simply keep up with competitors that are more digitally savvy. The installed base for the roughly \$50 billion advanced robotics industry, for example, is expected to grow 6 percent per year for

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<sup>3</sup> Ibid.

<sup>4</sup> Formally called the Infrastructure Investment and Jobs Act (IIJA).

<sup>5</sup> "Transforming advanced manufacturing through Industry 4.0," McKinsey, June 27, 2022.

Exhibit 3

## Digital investments are paying off in multiple ways for leading adopters.



<sup>1</sup>Overall equipment effectiveness.  
Source: World Economic Forum's Global Lighthouse Network

the next three years at least, as companies take advantage of smarter, more flexible, and more cost-effective equipment to automate more of their activities. And by 2030, Industry 4.0 applications are expected to account for almost half the total sales of 5G-connected Internet of Things (IoT) devices.

Over the coming years, US manufacturers stand to benefit from further waves of digital innovation as capital markets continue to make big investments in next-generation technologies. Annual investment in artificial intelligence (AI) has reached roughly \$150 billion, and investors are pouring \$250 billion into IoT technologies and \$300 billion into cloud computing every year.

Artificial intelligence, machine learning, and advanced technologies are also seen as key elements in the move toward new systems that can make sense of disconnected data and bring a new level of harmony to global supply chains. A recent McKinsey survey of supply chain leaders found that as part of their efforts to tackle repeated supply chain disruptions over the past year, 49 percent have invested in advanced analytics for supply and planning. Furthermore, 27 percent have accelerated these plans in order to mitigate the impact of geopolitical uncertainty on their supply chains.

**More skilled**

For these efforts to be effective, manufacturers will need a sharp focus on their employees' skills. Digitization and automation often create new roles faster than workforce training has historically been able to keep up. Solutions from the past aren't likely to work, because the skills manufacturers need in developing, managing, and maintaining automated equipment and digital processes have changed profoundly. McKinsey research projects that by 2030, the share of physical and manual tasks in the overall economy will have fallen by about 27 percent since 2016, replaced by greatly increased demand for technological and cognitive skills.

Companies can address skill gaps by using several different approaches. They can look outside the organization, hiring new staff with the right skills. They can build skills internally, retraining their existing workforces to prepare people for new roles. Or they can take a hybrid approach, including use of a skilled contract workforce to fulfill short-term needs while developing the necessary skills internally.

Stakeholders increasingly expect that companies will do more to retain and retrain their current workers where possible.

Manufacturing offers high-skill, high-wage jobs for American workers and could do so even more as the industry becomes more digitized and automated. Against the backdrop of an existing worker shortage and rapidly evolving skill requirements, employers can become skill builders and develop the workforce needed to remain competitive while helping people access meaningful and lasting employment.

**More resilient**

Automation, digitization, and the drive for greater sustainability are changing the way manufacturers produce their products. These factors are also encouraging CEOs to take a fresh look at where manufacturing is done. For some companies that supply US markets, the evolution of factor costs has significantly eroded the comparative advantage of global production locations and supplier networks. When organizations expand their definition of value to take account of

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sustainability issues and supply chain risks, the gap can narrow even further.

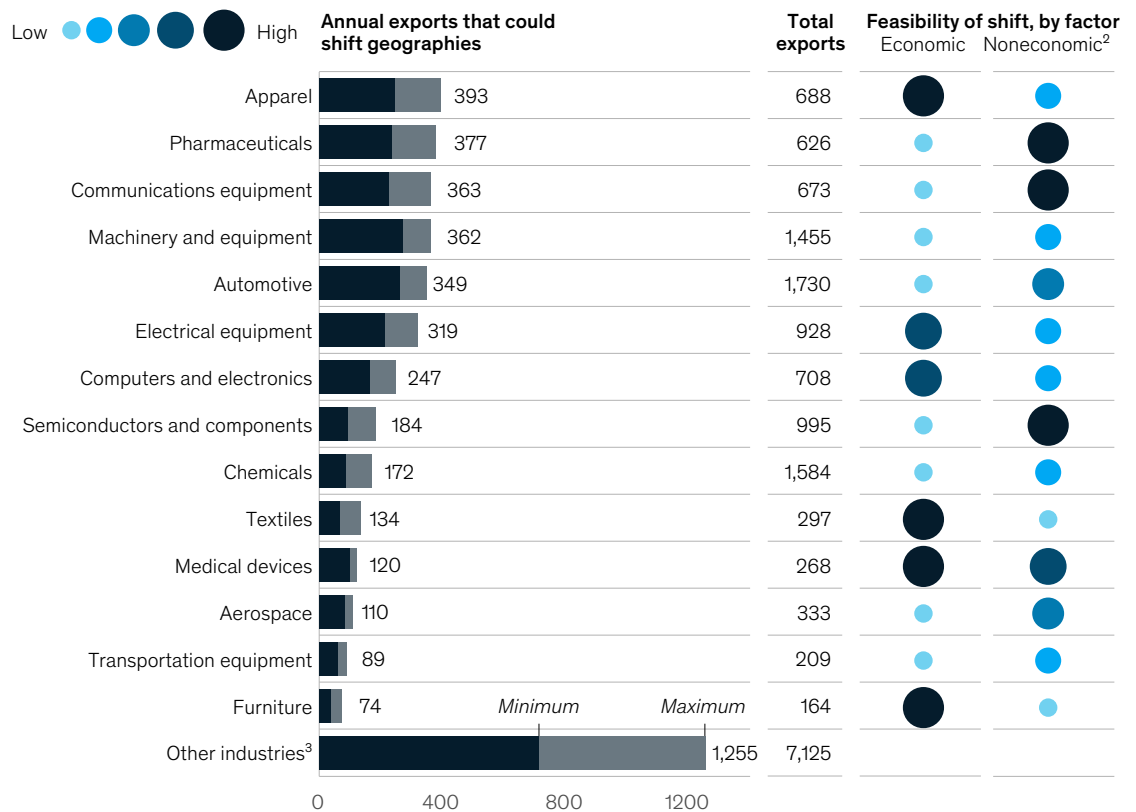
That shift could unlock a wave of regionalization in the world's manufacturing networks as companies develop shorter, more resilient, and more adaptable supply chains that better serve the needs of different markets. Across key manufacturing sectors, our analysis suggests that up to \$4.6 trillion in global trade could shift across regions in the next five years (Exhibit 4). Evidence

suggests that regionalization is already under way. The interregional share of total goods trade increased by 3.7 percentage points between the end of the global financial crisis and the beginning of the COVID-19 pandemic, for example. And the widespread supply chain disruptions of the past three years have injected further momentum into the trend. In our survey of supply chain leaders conducted early in 2022, 44 percent of respondents said they had increased their regional sourcing during the past year, and 51 percent said

Exhibit 4

### Supply chain regionalization is set to reshape global trade flows.

Feasibility of shift, and nearshoring potential in global supply chains, by annual exports,<sup>1</sup> \$ billion



<sup>1</sup> Low-end sizing: global imports from outside importing country's region average of economic and noneconomic feasibility. High-end sizing: global imports from outside importing country's region maximum of economic and noneconomic feasibility.  
<sup>2</sup> Noneconomic factors take into account goods deemed essential or targeted for national security or economic competitiveness considerations, based on proposed and enacted government policies and definitions of essential goods.  
<sup>3</sup> For resource-intensive industries, figures are dependent on access to resources that are geographically determined.  
 Source: Federal Reserve Bank of St. Louis; Observatory of Economic Complexity; UN Comtrade; US Bureau of Economic Analysis; US Bureau of Labor Statistics; World Input-Output Database; McKinsey Global Institute analysis



they expected the relevance of the approach to continue in the coming year and beyond.<sup>6</sup>

### Making it happen

US manufacturing companies that successfully restructure their supply chains to boost local production will have to make simultaneous changes on many fronts. Doing nothing may not be an option. Our analysis of the supply chain of a hypothetical midsize US consumer electronics company with a highly globalized production network suggests that rising factor costs over the next seven years are likely to erode the company's margins by six percentage points. Accounting for the costs of carbon emissions and likely supply chain risks would depress margins by a further five points (Exhibit 5). Even aggressive levels of automation would still leave the manufacturer with a seven-point margin reduction.

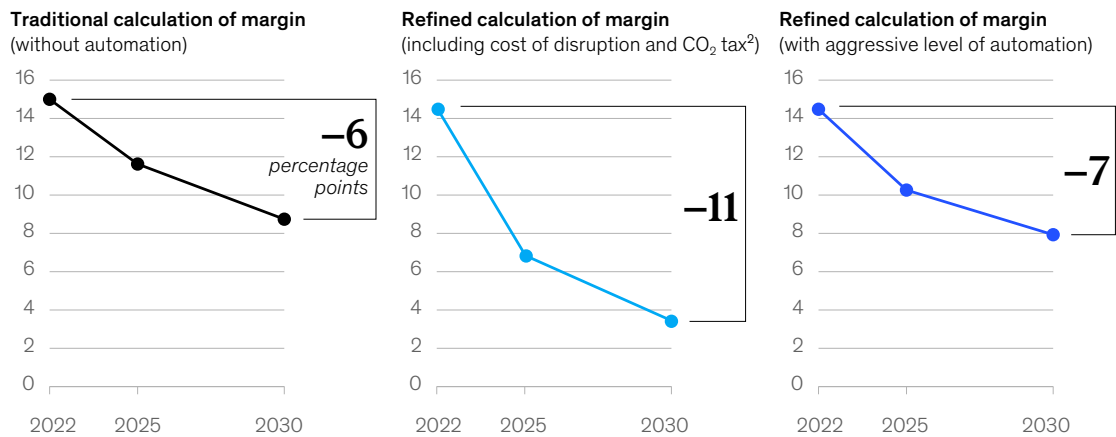
Although many US manufacturers recognize both the opportunity and the imperative to act, agreeing on the best way forward can be a significant challenge. In one 2020 McKinsey survey, 45 percent of respondents said the biggest barrier to the successful launch of supply chain digitization programs was a lack of internal alignment.

To succeed, therefore, companies will need a solid financial and operational plan that is aligned at all levels of the organization and spells out detailed actions and clear responsibilities for all stakeholders. Companies will need to be bold and farsighted, too. Large-scale changes to manufacturing processes and footprints may take ten or 20 years, and breaking away from the status quo will require creativity, commitment, and significant innovation. The remit for any such plan can only fall to the CEO.

Exhibit 5

## Rising factor costs are putting the profitability of today's manufacturing networks at risk.

Potential future margin with flat price,<sup>1</sup> on current global network,<sup>2</sup> %



<sup>1</sup>Example network analysis for a hypothetical Asian consumer electronics manufacturer serving Asia and North America. Assumes no inflation in sales price in the future.

<sup>2</sup>Includes disruption and potential CO<sub>2</sub> border tax impact (CO<sub>2</sub> tax for US).

<sup>6</sup> McKinsey Supply Chain Pulse Survey, 2022.



As their companies start to draw up those plans, every senior US manufacturing leader should take the time to answer four key questions:

1. What manufacturing trends will matter most for our industry?
2. If we do nothing, how will these trends affect our performance?
3. How much can we improve our current manufacturing and supply chain performance to compensate?

4. What are the right big moves for our company over the long term?

The best approaches are often those which see relocation and reshoring as part of a project to transform and modernize the company—a chance to update processes, technology, people, and culture for the next phase of the digital age and stay in lockstep with ever-evolving demands, investors, regulators, and customers.

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