

24-12 Is the United States undergoing a manufacturing renaissance that will boost the middle class?

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October 2024

Note: The author is grateful for comments from Gary Hufbauer, Adam Posen, and participants at seminars at Harvard Kennedy School and the Peterson Institute. He is especially grateful to Steve Weisman and Madona Devasahayam for guidance and editorial assistance, Barbara Karni for copyediting, Julieta Contreras for data verification, and Christopher Ong for research assistance.

The historic trend of the declining share of jobs in manufacturing in the United States has bedeviled politicians and policymakers over many years. Elected in 2020 in the wake of an economic downturn aggravated by the COVID-19 pandemic, President Joseph R. Biden Jr. made the goal of his economic policies to “build back better” and restore the middle class by reviving industrial jobs, especially in the Midwest, which he labeled “growing the economy from the bottom up and the middle out.”¹ The emphasis on manufacturing was reinforced by an economic nationalist goal of returning jobs supposedly sent overseas back to US shores—“making and building it in America,” as the administration proclaimed.²

This emphasis is reflected in the special incentives for US manufacturing in President Biden’s programs. He raised the threshold local content requirement for procurement by the US government. The Infrastructure Investment and Jobs Act (also referred to as the Bipartisan Infrastructure Law) requires that all iron, steel, manufactured products, and construction materials used in its projects be made in America.³ The CHIPS and Science Act appropriates \$24 billion in tax credits for manufacturing semiconductors in the United States and another **\$39 billion** to provide incentives for investment in chip facilities and equipment in the United

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1 White House, [The Biden-Harris Economic Blueprint](#), September 2022, p. 18.

2 Ibid.

3 White House, [Fact Sheet: The Bipartisan Infrastructure Deal](#), Briefing Room Statement, November 6, 2021.

States.⁴ The Inflation Reduction Act (IRA) provides tax credits for clean energy investments and production and the purchase of electric vehicles (EVs) that are assembled in North America and have batteries that use minerals that are mined and refined in the United States or a country with which the United States has a free trade agreement.⁵

The administration's policies have expanded the base of manufacturing employment on the margins in recent years. But despite their appeal, these policies are unlikely to be the key to achieving middle class growth, because manufacturing no longer plays the role it played in the past in providing opportunities for workers without college degrees to join the middle class.⁶ Manufacturing can still help achieve other goals, such as providing hardware for the digital revolution; weapons for national security; and the EVs, wind turbines, and solar panels that are vital for decarbonization. But the sector is now too small to play a major role in reviving America's depressed regions and providing significant opportunities for American workers.

The appeal of creating manufacturing jobs is not likely to subside politically in the United States. But the United States is hardly alone in experiencing a long trend of declining manufacturing employment. As a result of increased automation and technological change and the shift in demand toward services, manufacturing accounts for a declining share of employment and output in all high-income economies and many emerging-market economies. Remarkably, declining trends in the share of manufacturing employment are evident even in countries such as Germany, South Korea, Japan, Singapore, and China, despite their substantial trade surpluses in manufactured goods (Lawrence 2020, 2024).⁷

HAS THERE BEEN A US MANUFACTURING RENAISSANCE?

The press and the Biden administration have heralded a resurgence in US manufacturing. In August 2023, for example, the *Financial Times* reported that \$224 billion in clean-tech and semiconductor projects had been announced in the year after the IRA and the CHIPS Act were passed, with every project worth more than \$100 million.⁸ The following month, in a column titled "The American Renaissance Is Already at Hand," David Brooks of the *New York Times* wrote about "a torrid manufacturing boom."⁹ His colleague Nobel Prize-winning economist Paul Krugman suggested that the new industrial policies had already

4 Justin Badlam, Stephen Clark, Suhrid Gajendragadkar, Adi Kumar, Sara O'Rourke, and Dale Swartz, [The CHIPS and Science Act: Here's What's in It](#), McKinsey & Company, October 4, 2022.

5 For a comprehensive analysis of the IRA, see Bistline, Mehrotra, and Wolfram (2023).

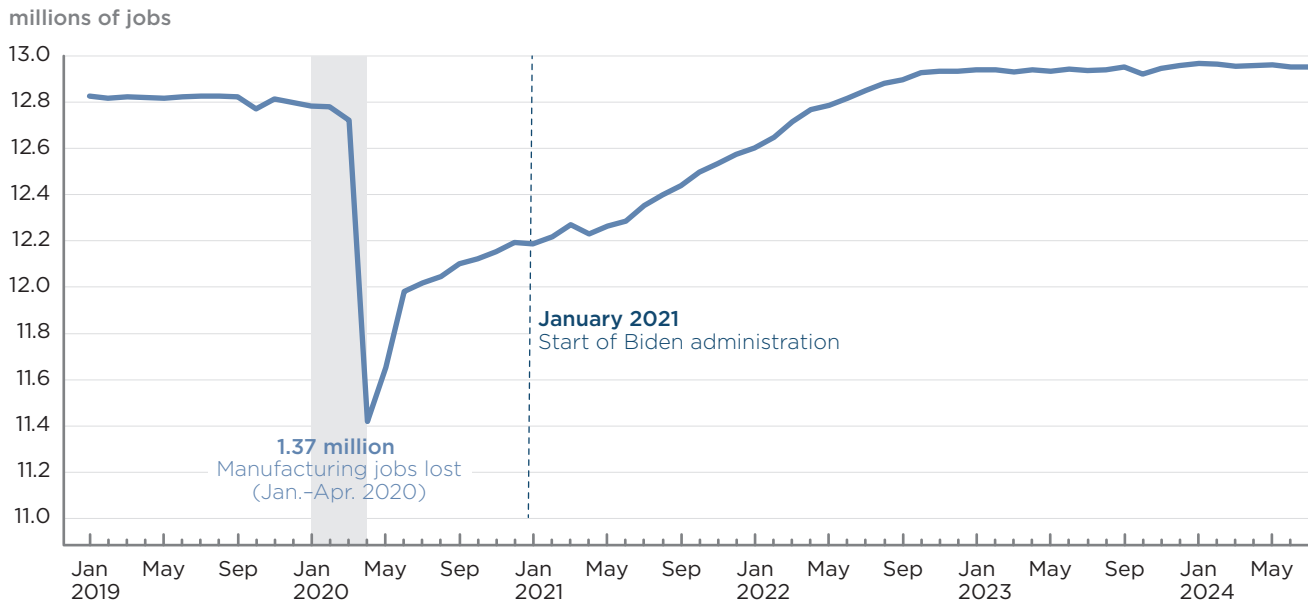
6 This mistaken view is shared by Robert Lighthizer, US trade representative in the Trump administration, who advocates increasing tariffs to rejuvenate American manufacturing. See "Donald Trump's former trade chief makes the case for more tariffs," *By Invitation: American trade policy*, *The Economist*, March 8, 2024. In Lawrence (2024), I elaborate on this argument.

7 Singapore had a very large trade deficit as a share of GDP from 1962 until 1997, averaging 25 percent of GDP. But between 1998 and 2018, it averaged a trade surplus of 15 percent of GDP.

8 See Amanda Chu, Oliver Roeder, and Alex Irwin-Hunt, "Inside the \$220bn American Cleantech Project Boom," *Financial Times*, August 16, 2023.

9 David Brooks, "The American Renaissance Is Already at Hand," *New York Times*, September 7, 2023.

Figure 1
US manufacturing employment, January 2019–July 2024



Source: Federal Reserve Bank of St. Louis, Federal Reserve Economic Data (FRED), <https://fred.stlouisfed.org/series/MANEMP>.

generated “a huge wave of private investment in manufacturing, even though very little federal money has yet been distributed.”¹⁰

The White House has also trumpeted the resurgence of US manufacturing. In March 2023, it boasted that more than 800,000 jobs had been added to manufacturing employment since President Biden took office, “the most of any president on record.”¹¹ In December 2023, Lael Brainard, the president’s national economic advisor, argued that “the Bipartisan Infrastructure Law, Inflation Reduction Act, and CHIPS and Science Act are fueling a Made in America manufacturing rebound.”¹²

In fact, the growth in manufacturing employment was much weaker than these accounts suggest. The manufacturing employment increases immediately after mid-2020 need to be judged in the context of the unusual US business cycle brought about by the disruptions from the COVID-19 pandemic. Between January and April 2020, manufacturing employment plummeted by 1.37 million of jobs (figure 1). The employment increases cited by the administration were simply a rebound from this extraordinary decline, which had already begun before President Biden took office. After returning to its previous levels, the pace of manufacturing employment growth slowed markedly, with manufacturing employment barely growing between September 2022 and July 2024.

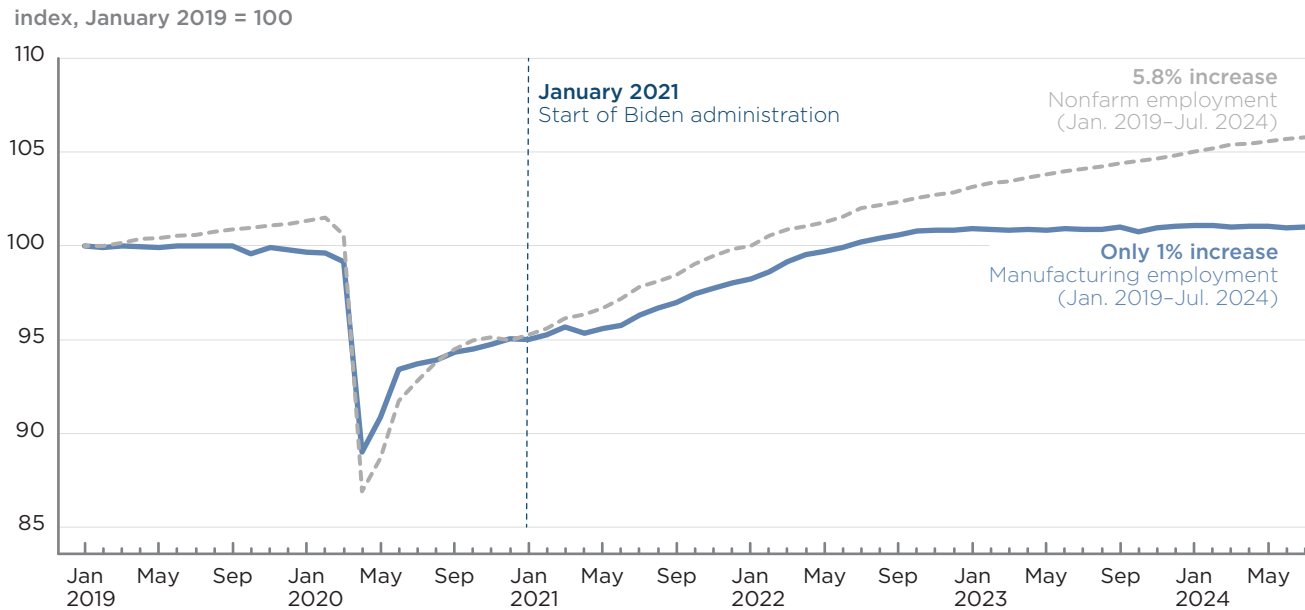
In July 2024, manufacturing employment was only 1.0 percent higher than it had been in January 2019 (figure 2). By contrast, over the same period,

10 Paul Krugman, “Biden and America’s Green Push,” *New York Times*, August 17, 2023.

11 White House, *The Biden-Harris Economic Blueprint*, September 2022, p. 17.

12 The White House, *Statement from National Economic Advisor Lael Brainard on US Steel*, December 21, 2021.

Figure 2
US manufacturing and nonfarm employment, January 2019–July 2024



Source: Federal Reserve Bank of St. Louis, Federal Reserve Economic Data (FRED), <https://fred.stlouisfed.org/series/MANEMP>.

nonfarm employment increased by 5.8 percent. The result was a steady decline in the manufacturing employment share of nonfarm employment (figure 3). As of July 2024, the data showed no renaissance in manufacturing employment. Employment simply recovered to 2019 levels and stagnated.

Output growth in manufacturing has also been relatively slow. Between the first quarter of 2019 and the first quarter of 2024, the ratio of real manufacturing output to GDP (both measured in 2017 dollars) fell 5.2 percent (figure 4). Manufacturing's role in the expansion of US output has been minimal.

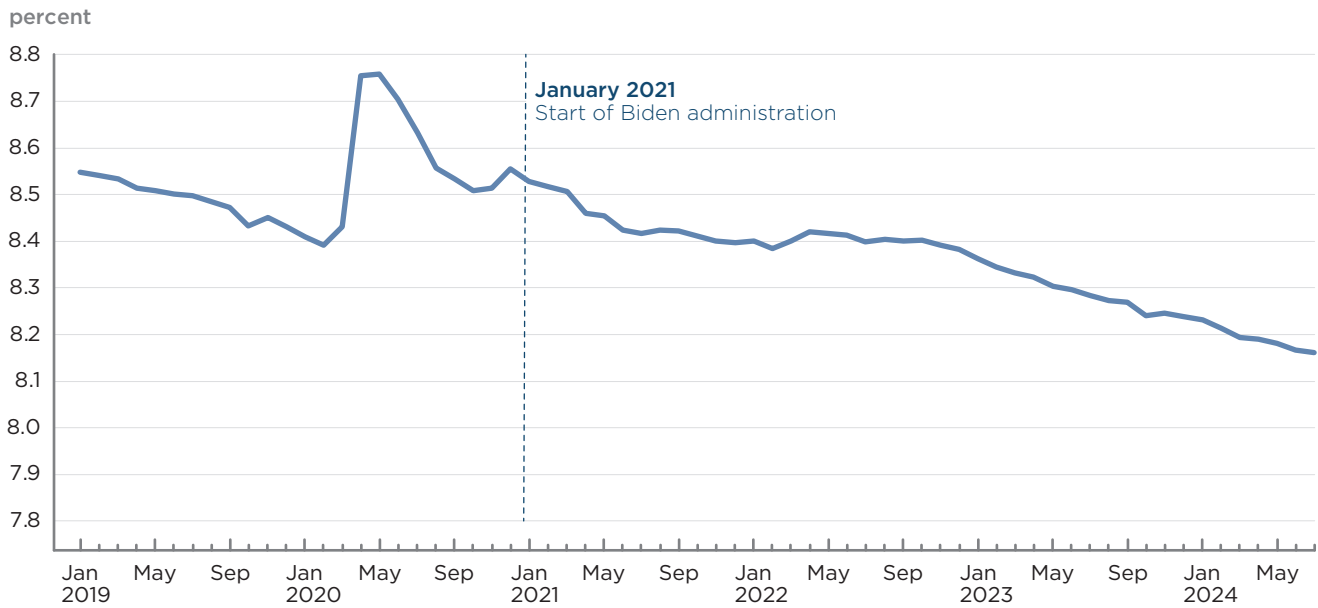
The slow growth in manufacturing employment combined with the sector's declining output share resulted in slower growth in labor productivity growth in manufacturing than in the economy as a whole. In the second quarter of 2024, labor productivity in the business sector, for example, was 12.7 percent higher than in the same period in 2017. In contrast, labor productivity in manufacturing fell by 2.0 percent.¹³ Between 2017 and 2022 (the latest data available), the increase in total factor productivity in manufacturing—the more comprehensive measure of the rise in output relative to all inputs used in manufacturing—was less than 0.1 percent.¹⁴ By contrast, for decades until 2010, faster productivity growth in manufacturing than in the rest of the economy was the norm.¹⁵

13 Bureau of Labor Statistics, *Labor Productivity and Cost Measures: Major Sectors: Nonfarm Business, Business, Nonfinancial Corporate, and Manufacturing*, August 1, 2024.

14 Bureau of Labor Statistics, *Total Factor Productivity and Related Measures, Major Industries*, March 21, 2024.

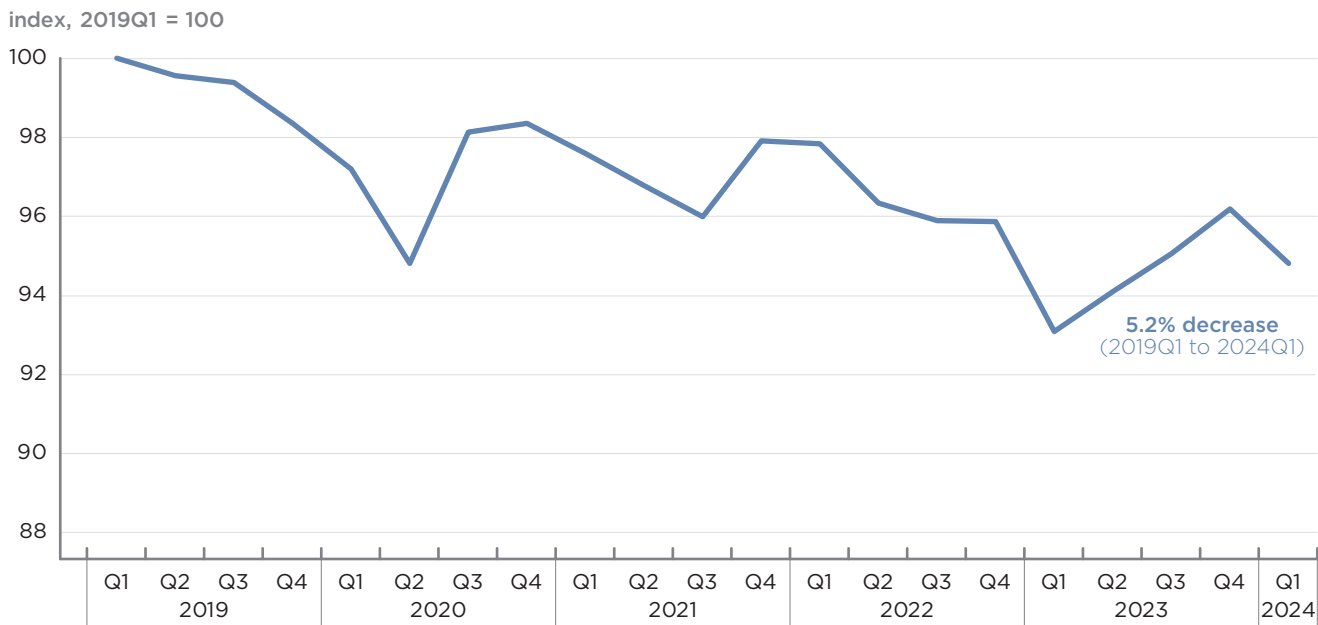
15 For example, output per worker was 2.5 percent faster in manufacturing than in the economy as a whole between 1987 and 2000 and 3.69 percent faster between 2000 to 2010 (Lawrence 2024).

Figure 3
Manufacturing employment as percent of nonfarm employment in the United States, January 2019–July 2024



Source: Federal Reserve Bank of St. Louis, Federal Reserve Economic Data (FRED), <https://fred.stlouisfed.org/series/MANEMP>.

Figure 4
Ratio of real manufacturing output to GDP in the United States, 2019Q1–2024Q1

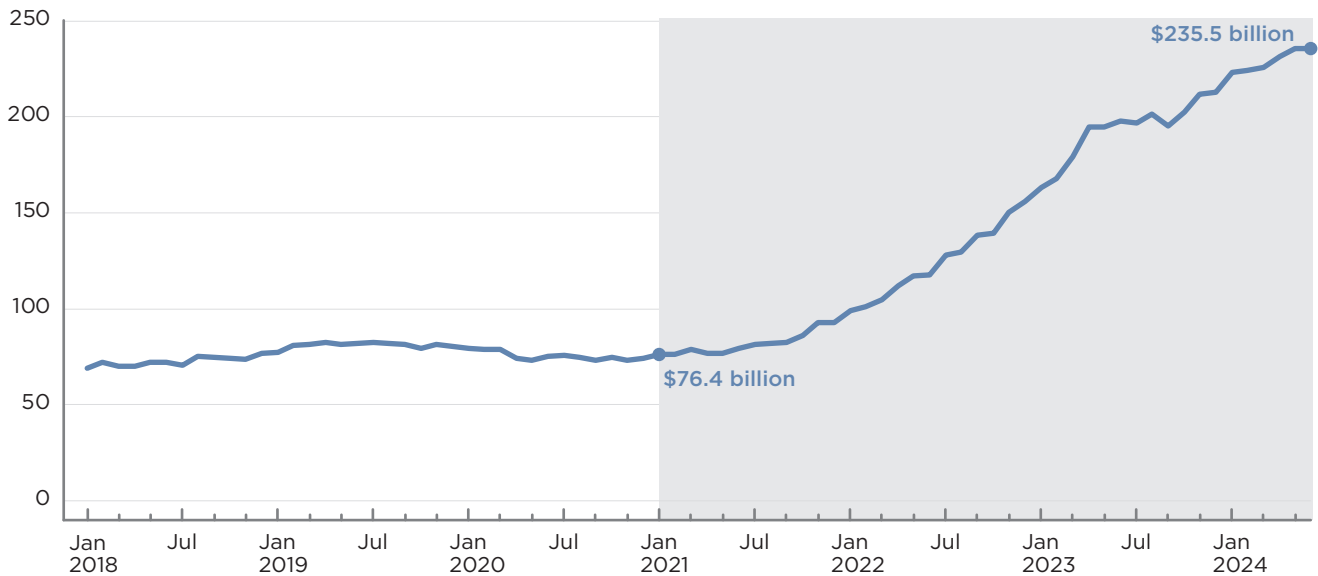


Note: Figures are measured in 2017 chain dollars. Data are seasonally adjusted.

Source: US Bureau of Economic Analysis, Chain-Type Quantity Indexes for Value-Added by Industry.

Figure 5
US spending on manufacturing construction, 2018–24

billions of dollars, annual rate



Note: Figures are seasonally adjusted.

Source: US Census Bureau via Federal Reserve Bank of St. Louis, Federal Reserve Economic Data (FRED).

In sum, in the first three and a half years of the Biden administration, there was no renaissance in manufacturing. Employment growth stagnated after the pandemic recovery, the share of manufacturing in employment and output declined, and manufacturing labor productivity did not rise.

WILL THERE BE A MANUFACTURING RENAISSANCE?

This analysis may be too backward looking. More manufacturing employment could be in the offing: Manufacturing construction spending surged, from an annual rate of \$76.4 billion in January 2021 to \$235.5 billion in June 2024 (figure 5).¹⁶ The major sources of the surge in construction were the computer, electronic, and electrical manufacturing industries.¹⁷

Consistent with this more optimistic narrative, the White House has kept track of announcements by private firms of their investment plans in the clean-tech and high-tech sectors that the Biden programs have emphasized. By July 2024, these announcements had reached a cumulative total of \$897.8 billion since President Biden took office, of which \$738 billion was in manufacturing and \$160 billion in clean power.¹⁸ This figure includes \$395.2 billion in semiconductors, \$176.5 billion in EVs and batteries, \$159.9 billion in clean power, \$80.7 billion

16 Federal Reserve Bank of St. Louis, Federal Reserve Economic Data, [Total Construction Spending: Manufacturing in the United States](#).

17 US Department of Treasury, [Unpacking the Boom in US Construction of Manufacturing Facilities](#).

18 White House, [President Joe Biden: Investing in America](#).

in clean energy manufacturing, \$43.9 billion in heavy manufacturing, and \$41.6 billion in biomanufacturing.

Not all these investments can be attributed to the Biden programs, as some might have been made regardless of the programs. Nonetheless, a significant share was undoubtedly made in response to the benefits firms received or expected to receive through program grants and tax credits by the federal government and the states.

The White House has provided detailed data on these investments by state.¹⁹ These data can be used to provide very rough preliminary estimates of the magnitude and location of the additional manufacturing jobs these investments could generate. A simple approach is to assume that (a) the investments announced represent additions to the net capital stock in manufacturing and increase employment at a rate that matches the average manufacturing labor to capital ratio in 2022 and (b) the employment share of each state will be proportional to its share in the overall value of the announced investments.

The most recent estimate of the net capital stock in manufacturing at the time of this analysis is for 2022, so the analysis uses 2022 data in making the projections. According to the Bureau of Economic Analysis, in 2022, the net capital stock in manufacturing was \$5.479 trillion valued at 2022 prices.²⁰ Excluding clean power, which represents investments in utilities, the \$730.1 billion of announced investments in manufacturing as of July 2024 would be equal to 13.3 percent of the 2022 manufacturing capital stock.²¹ In 2022, about 12.8 million people were employed in manufacturing.²² Assuming a constant capital-labor ratio in manufacturing, these investments would increase demand for manufacturing workers by $0.133 * 12.8 = 1.7$ million. The same methodology suggests that an additional 25,200 workers would be demanded in utilities producing clean energy.²³ Between 2000 and 2023, US employment in manufacturing fell from 17.265 million to 12.943 million, a decline of 4.323 million jobs.²⁴ The estimated 1.7 million manufacturing jobs created would represent 39.3 percent of the manufacturing jobs lost between 2000 and 2022—but this figure overstates the net impact, because it omits displacements and offsetting declines in other industries.

19 The detailed state data by investment category and aggregate investments by state do not correspond exactly to the aggregates by type of investment and of all states. Summing the detailed underlying data yields an aggregate investment of \$887.2 billion rather than the \$897.8 billion reported by the White House. As the difference is very small (for reasons that are unclear), it does not make a significant difference to the calculations in table 1 and 2.

20 Bureau of Economic Analysis, [Current Cost of Private Fixed Assets by Industry](#).

21 The White House announced a total of \$730.1 billion for manufacturing, but the investments in the excluded states are small and mainly in clean power, which is not counted as manufacturing. Alaska (\$8 million) and the District of Columbia (\$5 billion) have investments only in clean power, and Hawaii has investments of \$95 million in clean manufacturing and \$135 million in clean power. The aggregate manufacturing number is therefore distributed over the 48 states in the continental United States.

22 Bureau of Economic Analysis, [Total Full-Time and Part-Time Employment by NAICS Industry](#).

23 Utilities are very capital intensive. In 2022, the net capital stock in utilities was \$3.531 trillion and employment was 556,000. An increase of \$159.9 billion would increase the capital stock by 4.5 percent and employment by just 25,178 jobs. The estimated total employment associated with all the announced investments in manufacturing and clean energy would equal 1.725 million.

24 See Federal Reserve Bank of St. Louis, Federal Reserve Economic Data (FRED), [All Employees, Manufacturing](#).

This approach obviously paints with a very broad brush. The estimates are intended to provide a sense of the order of magnitudes of the potential employment impacts of the investments rather than precise estimates. In fact, capital-labor ratios differ—by industry, firm, and state—and as it will take several years for the investments to be completed, the ratios are likely to change.

The intention here is to capture the long-run additions to manufacturing employment if these investment projects are carried out. These estimates do not include the jobs created in planning, constructing, and equipping the facilities. The estimates also exclude the long-run value-added and employment generated in nonmanufacturing sectors.

It should be emphasized that these estimates take account only of positive prospective additions to employment associated with the investments and ignore factors that could offset this growth, such as employment declines associated with the shutting down of manufacturing production dependent on fossil fuels, declines from auto parts production rendered obsolete by EVs, depreciation of existing manufacturing assets, possible increases in productivity growth from automation, declines in other manufacturing industries and price and employment changes since 2022.

Moreover, some of the investments might not actually be made—because of changes in firm plans; implementation difficulties, such as failure to obtain permits, the federal and state grants the announced investments were predicated upon, and/or sufficiently skilled workers; and changing demand conditions. Since grants are still being made, however, it is also possible that the tabulations could underestimate the ultimate magnitudes of the investments eventually spurred by the programs.

Given that the economy is close to sustainable full employment (the unemployment rate was about 4 percent in August 2024), most of the workers who take jobs in these operations are most likely currently working in other jobs rather than unemployed or out of the labor force. This means that the estimates should be regarded as depicting potential changes in the industrial and geographic composition of employment rather than aggregate employment additions at the national level.

Impacts by State

Some states could experience very substantial percentage increases in demand for manufacturing employment (table 1).²⁵ The states with manufacturing employment gains from the announcements of 30 percent or more are Arizona (139.2 percent increase), Idaho (79.2 percent), West Virginia (57.5 percent), New York (47.8 percent), Oregon (47.3 percent), and New Mexico (46.3 percent). A second group of states are above 20 percent. They include Nevada (28.3 percent), Louisiana (26.4 percent), Texas (25.7 percent), and Georgia (21.3 percent).

The location of these investments represents a redistribution of US manufacturing geographically, as the employment effects are concentrated in

25 Because they use more recent data and a slightly different methodology, the estimates in table 1 here differ from the announcement employment numbers in table 10.1 in my book (Lawrence 2024).

Table 1

Estimated impact of announced investments (as of July 2024) on wage and salary employment in manufacturing in the United States, by state

State	Manufacturing employment, 2022 (no. of jobs)	Total employment, 2022 (no. of jobs)	Percent share of employment in the announcements (as of July 2024)	Cumulative share of announcements (percent)	Estimated additional employment due to announced investments (above 2022 levels)		
					Number of jobs	Share of manufacturing employment (percent)	Share of total employment (percent)
1 Arizona	189,823	3,206,670	15.5	15.5	264,179	139.2	8.2
2 Idaho	73,559	865,816	3.4	18.9	58,277	79.2	6.7
3 West Virginia	46,448	709,777	1.6	20.5	26,714	57.5	3.8
4 New York	423,805	9,601,792	11.9	32.4	202,720	47.8	2.1
5 Oregon	192,959	2,008,171	5.4	37.8	91,216	47.3	4.5
6 New Mexico	28,984	878,478	0.8	38.6	13,417	46.3	1.5
7 Nevada	65,454	1,528,778	1.1	39.7	18,501	28.3	1.2
8 Louisiana	134,072	2,001,020	2.1	41.7	35,444	26.4	1.8
9 Texas	924,919	13,887,510	13.9	55.7	237,313	25.7	1.7
10 Georgia	420,508	4,988,559	5.3	61.0	89,742	21.3	1.8
11 North Carolina	474,624	5,011,689	5.4	66.4	92,007	19.4	1.8
12 Utah	150,327	1,759,886	1.5	67.9	26,194	17.4	1.5
13 South Carolina	261,614	2,307,528	2.2	70.2	38,232	14.6	1.7
14 Ohio	686,149	5,632,510	5.8	75.9	98,123	14.3	1.7
15 Kansas	168,944	1,502,382	1.3	77.2	22,375	13.2	1.5
16 Tennessee	367,734	3,305,841	2.8	80.1	48,064	13.1	1.5
17 Kentucky	252,490	2,062,126	1.9	81.9	32,036	12.7	1.6
18 Indiana	543,813	3,281,893	4.0	86.0	68,694	12.6	2.1
19 Michigan	610,763	4,454,417	3.6	89.6	62,119	10.2	1.4
20 North Dakota	27,457	446,727	0.2	89.8	2,739	10.0	0.6
21 Mississippi	148,555	1,226,196	0.8	90.5	12,903	8.7	1.1
22 Colorado	153,262	3,003,053	0.7	91.3	12,110	7.9	0.4
23 Alabama	273,952	2,154,012	1.2	92.5	20,960	7.7	1.0
24 Arkansas	163,242	1,331,331	0.7	93.1	11,299	6.9	0.8
25 South Dakota	45,254	475,287	0.2	93.3	2,914	6.4	0.6

State	Manufacturing employment, 2022 (no. of jobs)	Total employment, 2022 (no. of jobs)	Percent share of employment in the announcements (as of July 2024)	Cumulative share of announcements (percent)	Estimated additional employment due to announced investments (above 2022 levels)		
					Number of jobs	Share of manufacturing employment (percent)	Share of total employment (percent)
26 Wyoming	9,780	290,384	0	93.4	606	6.2	0.2
27 Oklahoma	129,268	1,743,257	0.3	93.7	5,762	4.5	0.3
28 Rhode Island	40,320	511,841	0.1	93.8	1,781	4.4	0.3
29 California	1,329,773	18,814,316	2.9	96.7	50,144	3.8	0.3
30 Illinois	569,256	6,190,308	0.7	97.4	11,693	2.1	0.2
31 Maine	54,598	651,797	0.1	97.5	1,044	1.9	0.2
32 Washington	268,573	3,750,100	0.3	97.8	5,071	1.9	0.1
33 Maryland	111,705	2,823,994	0.1	97.9	2,089	1.9	0.1
34 Virginia	245,025	4,255,727	0.3	98.2	4,429	1.8	0.1
35 New Jersey	250,888	4,307,291	0.3	98.4	4,387	1.7	0.1
36 Massachusetts	238,450	3,779,020	0.2	98.7	4,033	1.7	0.1
37 Vermont	29,035	316,746	0	98.7	438	1.5	0.1
38 Minnesota	324,192	2,992,223	0.2	98.9	3,462	1.1	0.1
39 New Hampshire	69,914	700,357	0	98.9	746	1.1	0.1
40 Pennsylvania	565,320	6,194,150	0.4	99.3	6,013	1.1	0.1
41 Wisconsin	483,506	3,036,037	0.3	99.6	4,807	1.0	0.2
42 Montana	22,035	526,075	0	99.6	210	1.0	0
43 Delaware	26,303	482,138	0	99.6	245	0.9	0.1
44 Nebraska	103,508	1,051,451	0.1	99.7	893	0.9	0.1
45 Florida	409,195	9,798,386	0.2	99.9	3,415	0.8	0
46 Missouri	282,509	2,997,480	0.1	100.0	1,587	0.6	0.1
47 Connecticut	157,295	1,728,113	0	100.0	816	0.5	0
48 Iowa	223,734	1,627,793	0	100.0	0	0	0
Total	12,772,893	152,993,763	100.0		1,701,962	13.3	1.1

Note: Data are based on 48 states. Alaska, Hawaii, and the District of Columbia are excluded. The estimates in this table differ from the announcement employment numbers in table 10.1 in my book (Lawrence 2024) because of different methodologies and data used.

Sources: US Bureau of Economic Analysis, <https://www.bea.gov/data/employment/employment-by-state>; White House, Investing in America, <https://www.whitehouse.gov/invest> (accessed August 5, 2024).

Table 2
Effect of announced investments on employment, by group of states (percent above 2022 levels)

Group	Share of US manufacturing employment, 2022	Share of total US employment, 2022	Share of US manufacturing job losses, 2000-2022	Share of employment from the announcements	Increase in manufacturing employment	Increase in total state employment
Top 10 states	19.6	25.4	15.1	61.0	41.5	2.6
Next 10 states	27.7	19.1	28.7	28.8	13.8	1.6
Rest of states	52.7	55.5	56.1	10.2	3.7	0.3
Total	100.0	100.0	100.0	100.0	13.3	1.1
Rust Belt	27.1	18.4	32.2	14.8	7.3	0.9
States Biden won in 2020	53.6	57.7	63.5	50.2	12.5	0.9
Swing states in 2020	22.0	18.2	24.2	31.6	19.1	1.9

Source: Table 1 and CNN 2020 Presidential Election Results, <https://www.cnn.com/election/2020/results/president>.

western and southern states not traditionally specialized in manufacturing. The 10 states with the largest percentage increase in manufacturing employment in the announcements accounted for 19.6 percent of manufacturing employment in 2022 and 25.4 percent of overall US employment (table 2).

The new investment is not especially focused on the places in which manufacturing jobs have been lost. The top 10 states with the largest percentage growth in manufacturing employment accounted for just 15.1 percent of the US manufacturing jobs lost between 2000 and 2022.²⁶ But in these states the share of manufacturing employment associated with the announcements would account for 61 percent of the additional manufacturing jobs, and the impact on manufacturing employment demand in these states could be substantial. On average, manufacturing employment in these states could increase 41.5 percent.

The next 10 states, which account for 27.7 percent of US manufacturing employment in 2022, would obtain 28.8 percent of the additional employment share due to the announcements, and their average manufacturing employment would increase 13.8 percent. These states accounted for 28.7 percent of the manufacturing jobs lost between 2000 and 2022.

By contrast, the remaining states—which accounted for 52.7 percent of manufacturing employment in 2022, 55.5 percent of total US employment in 2022, and 56.1 percent of the manufacturing jobs lost between 2000 and 2022—make up just 10.2 percent of the share of additional employment associated with the announcements. On average, this would represent manufacturing employment increases of just 3.7 percent in the rest of the states. These announcements will thus have very small impacts in states accounting for more than half of US employment, and their impact will not be concentrated in the states in which most of the manufacturing losses occurred after 2000.

26 Bureau of Economic Analysis, *SAEMP27N Full-Time and Part-Time Wage and Salary Employment by NAICS Industry*.

Consider, for example, the effect on the Rust Belt (defined here as Illinois, Indiana, Michigan, Ohio, Pennsylvania, and Wisconsin). These states are disproportionately dependent on manufacturing jobs. In 2022, these states had 27.1 percent of US employment in manufacturing but just 18.4 percent of US employment overall. The Rust Belt's employment share of the announcements is just 14.8 percent, and demand for manufacturing employment in these states due to the announcements is projected to increase by just 7.3 percent, far less than the 13.3 percent increase in overall manufacturing demand in the United States (table 2).²⁷ The announced investments are projected to create 251,448 jobs, equal to 17.3 percent of the 1.45 million manufacturing jobs these states lost between 2000 and 2022. For the Rust Belt, these investments will not represent a rebirth.

Electoral Considerations

Most Republicans opposed the IRA, which was responsible for the clean-tech dimension of these investments, and only 24 House Republicans supported the CHIPS Act. Despite Republicans' lack of support, the announced investments have not been biased toward states that voted for either presidential candidate in 2020. The states that President Biden won in 2020 accounted for 53.6 percent of manufacturing employment in 2022 and 63.5 percent of the manufacturing job decline between 2000 and 2022. The employment share of these states from the announced investments would equal 50.3 percent (see table 2).

Investments are more concentrated in swing states (defined as states in which the margin of victory in the 2020 election was less than 3 percent). Three of these states (Arizona, Nevada, and Georgia) are among the top 10 in terms of percentage increases in manufacturing employment tied to the announcements; North Carolina, another swing state, with a 19.4 percent increase in manufacturing employment tied to the announcements, ranked 11th (table 1). Together these four states, which are sometimes the focus of an electoral strategy emphasizing swing Sun Belt states, have 49 votes in the electoral college.

The manufacturing employment increases associated with the announcements are smaller in Rust Belt swing states, such as Michigan (10.2 percent), Pennsylvania (1.1 percent), and Wisconsin (1.0 percent), which together account for 44 electoral college votes.

Whether these investments will have a political impact remains to be seen. The investments could increase support for politicians who voted for the programs, in which case Democrats would benefit. But they could also increase support for incumbents, in which case the effects could be more balanced. If these investments are to help the administration politically, they point to focusing on their relatively large effects in the marginal western and southern states rather than Rust Belt states, especially Pennsylvania and Wisconsin.

27 According to the US Treasury, a disproportionate number of announced investments in clean energy projects are being located in regions of the country that experienced more pronounced losses in manufacturing employment in the 1990s and early 2000s (US Department of Treasury, "New US Department of the Treasury Analysis: Inflation Reduction Act Driving Clean Energy Investment to Underserved Communities, Communities at the Forefront of Fossil Fuel Production," [Press Release](#), November 29, 2023). But it is important to explore not simply the dollar value of these investments but also the jobs they will create, because clean power plants are very capital intensive and produce relatively few jobs.

It is also possible that the political impact of these policies could differ from their economic impact. Autor et. al (2024) report that while the economic impact of President Trump's tariffs on China had few positive effects, they did strengthen Republican support politically. Thus similarly, the expressive role of these programs in demonstrating concern for workers could ultimately be more powerful than the purely economic impact.

Effect on Total Employment

The manufacturing employment estimates of the investment announcements equal only 1.1 percent of total US employment (table 1). The largest percentage impacts occur in Arizona (8.2 percent), Idaho (6.7 percent), Oregon (4.5), and West Virginia (3.8 percent). Even in these states, the aggregate employment effects are still relatively small, however. Moreover, except for New York (at 2.1 percent), the increases in employment in the remaining states are all less than 2.0 percent—and in 24 of the states they are less than 0.5 percent. These investments would not, therefore, fundamentally change the aggregate sectoral employment composition of US employment. Taking account of the negative impact on fossil fuel-related employment, their impact would increase the manufacturing employment share by considerably less than 1 percent.

LONG-TERM OUTLOOK FOR MANUFACTURING EMPLOYMENT

Every year, the Bureau of Labor Statistics reports detailed projections of US employment by industry and occupation for the decade to come.²⁸ Its September 2023 report—which presumably took account of the anticipated impacts of the Biden programs passed a year earlier, as well as most of the announced investments that were made over the subsequent year—forecasts that between 2022 and 2032, manufacturing employment would decline by 113,500 to 12.7 million while aggregate employment would increase by 4.7 million (table 3).²⁹ Using a comprehensive measure of the labor force that includes self-employed workers, these projections imply that the manufacturing employment share would fall from 7.8 percent in 2022 to 7.5 percent in 2032. The calculations of the employment impact of the new investments ignore offsetting effects, but even if we assume that they increase manufacturing employment by the full 1.7 million jobs and that they have all been overlooked in the BLS projections, these investments would increase the manufacturing employment share to 8.5 percent—just 0.7 percentage points more than it was in 2022. But these official projections of manufacturing employment growth provide evidence that this would overstate the manufacturing employment in the future. In the BLS projections, implicitly, any employment increases attributable to the Biden programs would be more than offset by employment declines in other manufacturing industries.

The BLS report projects employment growth in manufacturing in only six industries, which together would add 218,500 jobs, of which more than half

28 It uses a comprehensive measure of the US labor force that includes not only nonfarm wage and salary workers but also workers in agriculture and the self-employed.

29 Bureau of Labor Statistics, [Employment Projections 2022-2032](#), September 6, 2023.

Table 3
Projected changes in US employment between 2022 and 2032, by sector

Sector (NAICS code)	Change in number of jobs (thousands)
Total	4,665.5
Manufacturing (31-33)	-113.4
Food manufacturing (311)	81.2
Beverage and tobacco manufacturing (312)	34.4
Textile mills and textile product mills (313, 314)	-22.0
Apparel, leather and allied product manufacturing (315, 316)	-27.7
Wood product manufacturing (321)	-4.7
Paper manufacturing (322)	-44.1
Printing and related support activities (323)	-63.4
Petroleum and coal products manufacturing (324)	-1.7
Chemical manufacturing (325)	21.6
Plastics and rubber products manufacturing (326)	-5.9
Nonmetallic mineral product manufacturing (327)	-8.1
Primary metal manufacturing (331)	-28.5
Fabricated metal product manufacturing (332)	-7.1
Machinery manufacturing (333)	8.2
Computer and electronic product manufacturing (334)	29.8
Electrical equipment, appliance, and component manufacturing (335)	43.3
Transportation equipment manufacturing (336)	-87.7
Furniture and related product manufacturing (337)	-29.8
Miscellaneous manufacturing (339)	-1.3

NAICS = North American Industry Classification System

Note: Figures are for wage and salary earners and self-employed earners.

Source: US Bureau of Labor Statistics, Employment Projections, [Employment by major industry sector](#).

would be in food and beverages and tobacco. Employment in other industries that were projected to grow included electrical equipment (by 43,300); computers and electronics (by 29,800 mainly because of 30,800 jobs in semiconductors); and chemicals (by 21,600, mainly because of an additional 19,100 jobs in pharmaceuticals).

These additional jobs were insufficient to offset the declines in 13 other industries, which total around 332,000. They included losses of 96,900 jobs in

motor vehicle parts, which constituted the bulk of the 87,700 jobs projected to be lost in transportation equipment manufacturing, presumably because of EVs. Employment was also expected to fall in printing (63,400 jobs lost), paper (44,100), furniture (29,800), primary metals (28,500), textiles (22,000), and apparel (7,700). Thus, although, with the notable exception of transportation, the sectors targeted by the Biden program with the CHIPS Act were expected to show some employment growth, these gains were offset by more pervasive jobs losses in the rest of manufacturing.

These estimates of manufacturing employment growth could be too low, but the analysis points to the perils in proclaiming a manufacturing “renaissance” based on selective anecdotes from a few industries and projects rather than a comprehensive consideration of the entire sector.

CONCLUSION

Although it will spur rapid manufacturing employment growth in nontraditional locations, the Biden programs have not created a broad renaissance in US manufacturing, and they are unlikely to do so in the future. The effects of the programs on the Rust Belt states that experienced large manufacturing employment losses since 2000 are likely to be modest, and the impact will not significantly change the sectoral composition of the US labor market.

Manufacturing still has an important role to play in providing the goods necessary to rebuild US infrastructure, promote the digital revolution, and ease the transition to a decarbonized US economy. But because of its relatively small overall employment share—and the growing bias toward hiring more educated workers—the sector no longer provides noncollege workers with the opportunities it used to. Although the Biden programs may achieve important social objectives, they are therefore unlikely to improve the opportunities for most workers without college degrees or help most of the country’s disadvantaged places.

Additional announcements are likely as grants from the Biden programs are awarded. The results from updated numbers are unlikely to change the central conclusion of this analysis, however. Even if additional announcements were to increase the manufacturing employment estimates used here by an additional 50 percent, manufacturing’s role in overall US employment would remain very modest. Additional policies with a focus far wider than manufacturing are needed to improve the prospects of non-college-educated workers and left-behind communities.³⁰

REFERENCES

- Autor, David, Beck Anne, Dorn David, and Hanson Gordon. 2024. *Help for the Heartland? The Employment and Electoral Effects of the Trump Tariffs in the United States*. NBER Working Paper 32082. Washington: National Bureau of Economic Research.
- Bistline, John, Neil Mehrotra, and Catherine Wolfram. 2023. Economic Implications of the Climate Provisions of the Inflation Reduction Act. *Brookings Papers on Economic Activity* (Spring). Washington: Brookings Institution.

³⁰ For proposals for some these policies, see chapter 11 of Lawrence (2024).

Langdon, David, and Rebecca Lehrman. 2012. *The Benefits of Manufacturing Jobs*. Washington: US Department of Commerce.

Lawrence, Robert Z. 2020. *Trade Surplus or Deficit? Neither Matters for Changes in Manufacturing Employment Shares*. PIIE Working Paper 20-15. Washington: Peterson Institute for International Economics.

Lawrence, Robert Z. 2024. *Behind the Curve: Can Manufacturing Still Provide Inclusive Growth?* Washington: Peterson Institute for International Economics.



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