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Economic Contribution of the U.S. Automotive Industry.

An Economic Contribution Analysis of
Automobile and Light Duty Motor
Vehicle and Motor Vehicle Parts
Manufacturing in the United States

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About the Authors

The Center for Automotive Research (CAR) is an independent, non-profit organization conducting industry-driven research and analysis. Focusing on critical areas like Energy & Sustainability, Technology, and Labor, Economics, and Policy, CAR has been a trusted resource for the automotive industry for over twenty years. www.cargroup.org

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Introduction

Automotive manufacturing is a critical industry in the United States. This research note examines the economic contribution of automobile and light duty motor vehicle manufacturing and motor vehicle parts manufacturing – quantifying and providing insight into the combined industries’ role in supporting employment, economic output, and tax revenues.

Furthermore, both automakers and suppliers have announced historical investments in across the United States. These investment announcements are tracked in the CAR Book of Deals, which captures public automaker and supplier announced capital investment projects across North America. This research note provides analysis of this proprietary CAR data source, highlighting the automotive industry’s importance to communities across the nation.

Methodology

To assess the economic contribution of light vehicle manufacturing across the United States, CAR conducted a multi-industry contribution analysis of automobile and light duty motor vehicle manufacturing and motor vehicle parts manufacturing¹ utilizing IMPLAN, an economic input output modeling application. This analysis employs a multi-region input-output (MRIO) to model direct, indirect, and induced employment, labor income, value added, output, and local, state, and federal tax revenue contribution. The MRIO methodology limits aggregation bias² and allows for examination of the interconnectedness of multiple regions. The model regions are based on the census regions and divisions of the United States³, with the MRIO implemented at the US division level. Please see the Appendix for table mapping states to divisions and regions. The automotive manufacturing industry contribution findings were determined using a multi-industry MRIO contribution analysis of the economic impact of automobile and light duty motor vehicle manufacturing and motor vehicle parts manufacturing modeled using IMPLAN economic analysis data software, 2022 data year.

The CAR Book of Deals, which tracks publicly announced capital investment projects announced by automakers and tracked suppliers across North America, allows one to look backwards to look forwards – analyzing capital investment announcements to forecast future impacts of the automotive

¹ NAICS 33611 and 3363

² Aggregation bias occurs when combining multiple geographies or industries and results in a loss of detail.

³ https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf

industry. In this research note, CAR has reviewed capital investments announced in 2023 captured by the Book of Deals and summarized the findings by US division and region. Book of Deals data can be used to as inputs into IMPLAN to inform economic impact analyses at such geographies as metropolitan statistical area, congressional district, state, or other custom regions.

Multi-Industry Contribution Analysis

Automotive manufacturing is a critical industry in the United States. Encompassing automobile and light duty motor vehicle manufacturing, as well as motor vehicle parts manufacturing including motor vehicle electrical and electronic equipment, gasoline engine and engine parts, metal stamping, seating and interior trim, steering, suspension components, brake systems, transmission and power train parts, and other motor vehicle parts manufacturing. CAR analyzed the economic contribution of the automotive manufacturing industry, examining the direct, indirect, and induced effects of the industry on US employment, labor income, value added, output, and tax revenue.

Automotive manufacturing in the US supports nearly \$100 billion in local, state, and federal tax revenue. Across the nation, this industry contributes most greatly to the Midwest, followed by the South, in collected tax revenue.

Table 1 shows the total local, state, and federal tax revenue supported by automotive manufacturing within each division and region.

Table 1. Economic contribution, supported tax revenue⁴

US Region	US Division	Local Tax Revenue	State Tax Revenue	Federal Tax Revenue
Midwest	East North Central	\$5,862,000,000	\$9,640,000,000	\$28,191,000,000
	West North Central	\$687,000,000	\$1,126,000,000	\$3,238,000,000
Midwest Total		\$6,550,000,000	\$10,766,000,000	\$31,429,000,000
Northeast	Middle Atlantic	\$1,094,000,000	\$1,141,000,000	\$3,234,000,000
	New England	\$179,000,000	\$275,000,000	\$829,000,000
Northeast Total		\$1,273,000,000	\$1,416,000,000	\$4,063,000,000
South	East South Central	\$1,560,000,000	\$3,527,000,000	\$9,127,000,000
	South Atlantic	\$1,893,000,000	\$2,330,000,000	\$7,409,000,000
	West South Central	\$905,000,000	\$1,164,000,000	\$4,252,000,000
South Total		\$4,357,000,000	\$7,021,000,000	\$20,788,000,000
West	Mountain	\$291,000,000	\$456,000,000	\$1,349,000,000
	Pacific	\$1,506,000,000	\$2,721,000,000	\$5,911,000,000
West Total		\$1,797,000,000	\$3,176,000,000	\$7,260,000,000
US Total		\$13,977,000,000	\$22,380,000,000	\$63,541,000,000

The automotive manufacturing industry directly supports nearly 775,000 jobs across the US. Automobile and light duty motor vehicle manufacturing direct employment is estimated at just over 240,000 while motor vehicle parts manufacturing contributes roughly another 535,000 direct jobs. Figure 1 shows the direct employment by state in the modeled by IMPLAN, 2022 data model. This direct contribution supports a total employment of 3,369,000 across the US, factoring in both indirect and induced employment effects. Among the four US regions noted above, the Midwest region has the highest employment levels supported by automotive manufacturing, with roughly 1.5 million jobs supported by the industry within the East North Central division, inclusive of Indiana, Illinois, Michigan, Ohio, and Wisconsin. The second largest division in terms of automotive manufacturing supported employment is the East South Central region, consisting of Alabama, Kentucky, Mississippi, and Tennessee.

⁴ Direct, indirect, and induced effects

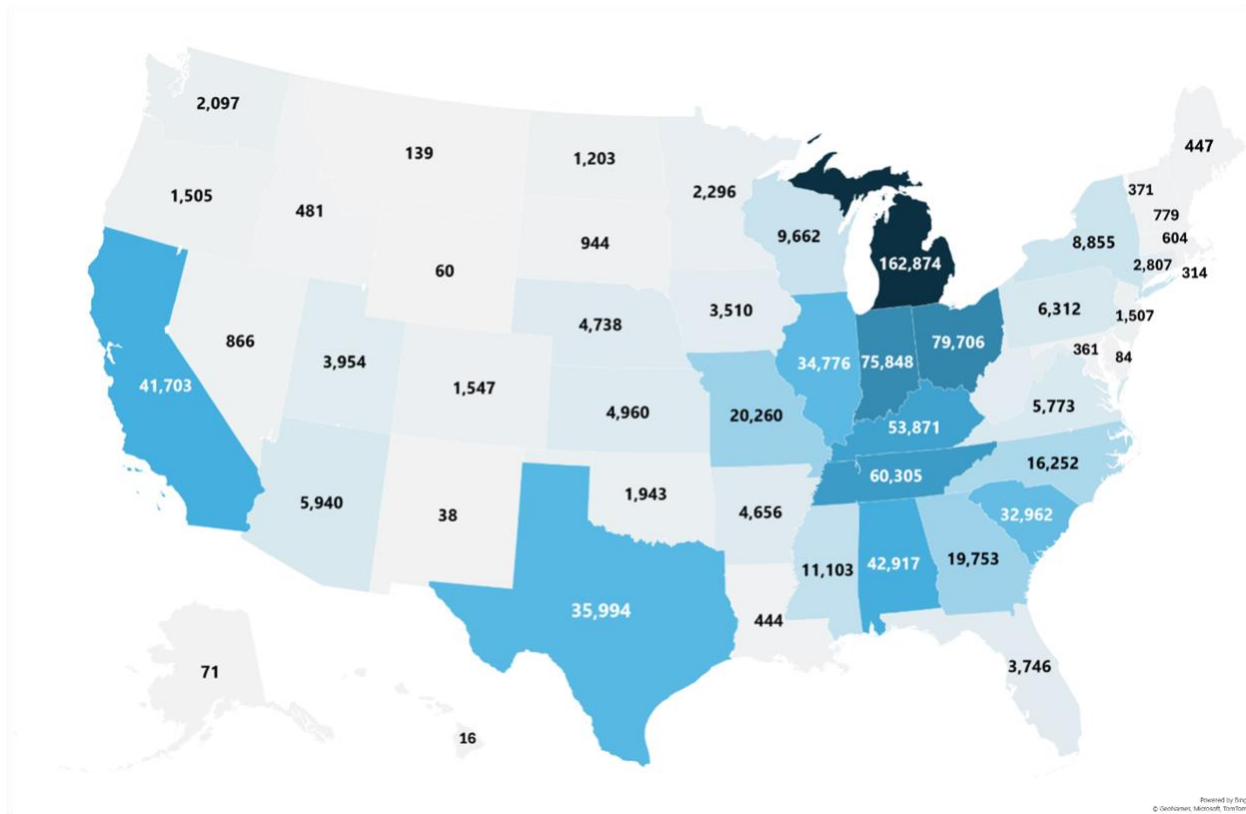


Figure 1. Automobile and light duty motor vehicle manufacturing and motor vehicle parts manufacturing direct employment by state

The 3,369,000 direct, indirect, and induced jobs supported by the US automotive manufacturing industry in turn support nearly \$260 billion in labor income. Labor income consists of all forms of employee compensation, including wages, salaries, and benefits, and proprietor income. This contributes to value added, which includes labor income in addition to other property income and taxes on production and imports. The total value added supported by automotive manufacturing in the US, which can be interpreted as the industry's contribution to gross domestic product, is over \$450 billion. The total output supported by automotive manufacturing in the US, which includes the total value added plus the value of intermediate goods and services, measures over \$1.275 trillion. Total employment, labor income, value added, and output supported by automobile and light duty motor vehicle manufacturing and motor vehicle parts manufacturing by US division is shown in

Table 2.

Table 2. Economic contribution, supported employment, labor income, value added, and output⁵

US Region	US Division	Employment	Labor Income	Value Added	Output
Midwest	East North Central	1,491,000	\$116,087,000,000	\$203,066,000,000	\$573,750,000,000
	West North Central	187,000	\$13,598,000,000	\$23,275,000,000	\$66,958,000,000
Midwest Total		1,677,000	\$129,685,000,000	\$226,341,000,000	\$640,708,000,000
Northeast	Middle Atlantic	152,000	\$12,820,000,000	\$21,120,000,000	\$42,441,000,000
	New England	38,000	\$3,217,000,000	\$5,144,000,000	\$11,155,000,000
Northeast Total		190,000	\$16,037,000,000	\$26,263,000,000	\$53,596,000,000
South	East South Central	534,000	\$38,892,000,000	\$65,138,000,000	\$228,053,000,000
	South Atlantic	408,000	\$28,654,000,000	\$49,987,000,000	\$134,069,000,000
	West South Central	233,000	\$16,815,000,000	\$35,721,000,000	\$89,044,000,000
South Total		1,175,000	\$84,361,000,000	\$150,846,000,000	\$451,166,000,000
West	Mountain	77,000	\$5,382,000,000	\$9,248,000,000	\$24,602,000,000
	Pacific	250,000	\$23,326,000,000	\$39,551,000,000	\$105,814,000,000
West Total		327,000	\$28,709,000,000	\$48,799,000,000	\$130,416,000,000
US Total		3,369,000	\$258,792,000,000	\$452,249,000,000	\$1,275,886,000,000

By considering indirect output, a measure of all output generated due to direct business to business spending, one can see the other industries most supported by automotive manufacturing output in the US. Unsurprisingly, the industry supported the most by automotive manufacturing economic contributions is the manufacturing industry. However, manufacturing only accounts for roughly 27.5% of the indirect output. Nearly three quarters of the total indirect output supported by automotive manufacturing takes place outside of manufacturing, led by wholesale trade, transportation and warehousing, and professional, scientific, and technical services. Indirect output supported by the US automotive manufacturing industry can be seen in

⁵ Direct, indirect, and induced effects

Table 3.

Table 3. Economic contribution, top 10 industries by supported indirect output

Top 10 Industries Supported by Indirect Jobs	Indirect Output	% of Total Indirect Output
Manufacturing	\$109,356,000,000	27.5%
Wholesale Trade	\$106,581,100,000	26.8%
Transportation and Warehousing	\$31,821,300,000	8.0%
Professional, Scientific, and Technical Services	\$24,484,700,000	6.2%
Finance and Insurance	\$20,669,800,000	5.2%
Management of Companies and Enterprises	\$19,261,100,000	4.9%
Administrative and Support and Waste Management and Remediation Services	\$18,613,400,000	4.7%
Real Estate and Rental and Leasing	\$15,740,300,000	4.0%
Information	\$15,493,900,000	3.9%
Utilities	\$10,970,300,000	2.8%
Other Industries	\$24,141,800,000	6.1%

One primary benefit of running a MRIO analysis is that it allows the inter-region effects of trade and commuting to be examined. Figure 2 shows the interconnectedness of the US divisions, depicting the inter-division flow of indirect jobs supported by the direct business to business transactions of the automotive manufacturing industry. This flow diagram shows how intertwined the automotive manufacturing industry is – automotive manufacturing activity in each individual US division supports indirect employment, output, value added, and tax revenue, in each of the other divisions across the nation. The East North Central division benefits from the highest number of indirect jobs supported by direct automotive manufacturing output in other US divisions. The automotive manufacturing industry in the East South Central division supports the most indirect jobs across other US divisions.

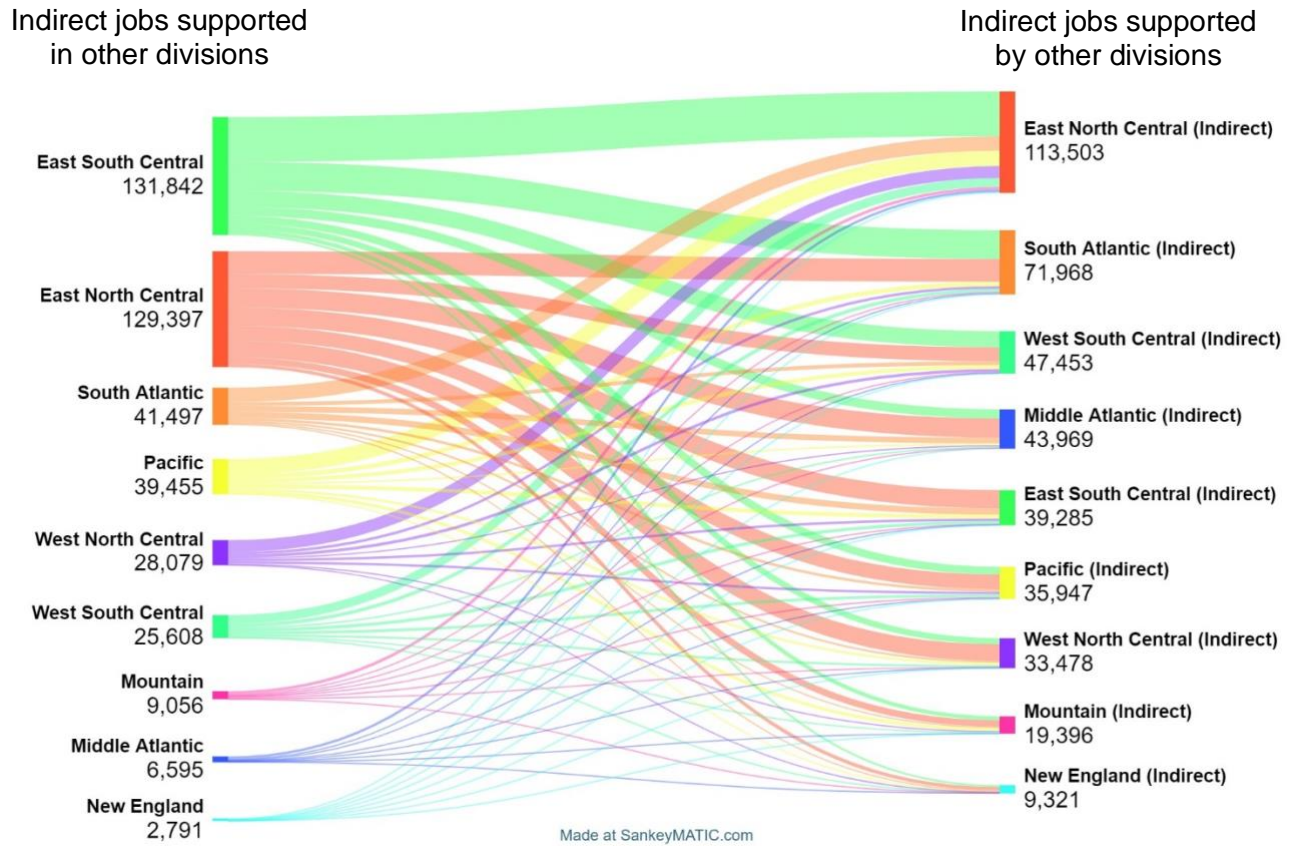


Figure 2. Inter-division connectedness: indirect output from inter-division trade and commuting flows

Book of Deals: 2023 Announced Investment

The prior multi-industry contribution analysis helps to define and examine the current economic contributions of automobile and light duty motor vehicle manufacturing and motor vehicle parts manufacturing in the US. By examining data captured in the Book of Deals, it is possible to analyze recently announced capital investment projects to better understand where the industry is heading in the future (as automotive investments typically amortize over the course of multiple years). In 2023, automakers and tracked suppliers announced over \$84 billion in capital investment projects across the US.

Table 4 shows 2023 capital investment announcement totals across US divisions. Additionally, the number of expected jobs to be newly created as a result of the announced projects are shown. Furthermore, these data are categorized by overarching vehicle technology type – electrification (e.g., electric vehicles, or EVs) versus other (non-EV). In 2023, automakers and tracked

suppliers announced at least \$72.5 billion towards electrification projects, or investments tied to EVs and EV batteries, and over 40,000 new jobs expected to be created in the future as these projects come to fruition.

Table 4. Automaker and tracked supplier announced investment in the US, 2023

Region	Division	Electrification: Investment Announced	Other (Non-EV): Investment Announced	Electrification: Expected New Jobs	Other (Non-EV): Expected New Jobs
Midwest	East North Central	\$28,634,100,000	\$8,286,690,000	16,330	987
	West North Central	\$1,000,000,000	\$100,000,000		200
Midwest Total		\$29,634,100,000	\$8,386,690,000	16,330	1,187
Northeast	Middle Atlantic	\$266,000,000	\$42,000,000	700	550
	New England	\$60,000,000		200	
Northeast Total		\$326,000,000	\$42,000,000	900	550
South	East South Central	\$4,280,100,000	\$1,022,000,000	3,776	1,006
	South Atlantic	\$25,126,600,000	\$763,000,000	17,742	3,638
	West South Central	\$1,270,700,000	\$585,000,000	1,550	50
South Total		\$30,677,400,000	\$2,370,000,000	23,068	4,694
West	Mountain	\$10,370,000,000	\$129,000,000	3,420	
	Pacific	\$1,500,000,000	\$1,000,000,000		
West Total		\$11,870,000,000	\$1,129,000,000	3,420	
Grand Total		\$72,507,500,000	\$11,927,690,000	43,718	6,431

Conclusion

Automotive manufacturing economic contribution supports over 3.3 million jobs across the US through direct, indirect, and induced employment and supports over \$450 billion in gross domestic product. Direct automobile and light duty motor vehicle manufacturing and motor vehicle parts manufacturing employment in each individual US division supports further economic output not only within the same division but, through the interconnectedness of trade and commuting flows, supports further indirect and induced output, jobs, and tax revenue in each and every other US division. This economic contribution will continue to grow as the over \$84 billion announced automaker and supplier capital investment is realized in the coming years, along with the expected creation of over 50,000 new jobs.

Appendix

Table 5. Census Regions and Divisions of the United States

Region	Division	State	Region	Division	State		
Midwest	East North Central	Indiana	Northeast	New England	Connecticut		
		Illinois			Maine		
		Michigan			Massachusetts		
		Ohio			New Hampshire		
		Wisconsin			Rhode Island		
	West North Central	Iowa			Vermont	Middle Atlantic	New Jersey
		Nebraska			New York		
		Kansas			Pennsylvania		
		North Dakota			South	South Atlantic	Delaware
		Minnesota					Division of Columbia
South Dakota		Florida					
Missouri		Georgia					
West	Mountain	Arizona	Maryland				
		Colorado	North Carolina				
		Idaho	South Carolina				
		New Mexico	Virginia				
		Montana	West Virginia				
		Utah	East South Central	Alabama			
		Nevada		Kentucky			
		Wyoming		Mississippi			
	Pacific	Pacific	Alaska	Tennessee			
			California	West South Central	Arkansas		
Hawaii			Louisiana				
Oregon			Oklahoma				
Washington			Texas				

Note: States were combined at the division level for the multi-industry contribution analysis MRIO.