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# THE IMPACT OF Japanese-brand Automakers on U.S. Employment

2026 UPDATE



By Thomas J. Prusa, PhD

## ABOUT THE AUTHOR

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## EXECUTIVE SUMMARY

For more than four decades, Japanese-brand automakers have been a major contributor in shaping U.S. manufacturing and have generated and supported millions of U.S. jobs. The Japanese-brand automakers are a significant source of U.S. employment, income, and industrial activity, with a deeply embedded presence in both manufacturing and retail.

In 2025, Japanese-brand automakers and their dealership networks supported approximately 2.34 million U.S. jobs. This includes nearly 480,000 direct jobs in manufacturing operations, research and development, corporate activities, sales/distribution, and dealerships. **These direct jobs supported an additional 946,000 jobs in the automotive supply chain and related industries, as well as 919,000 spin-off jobs generated through employee spending.** Together, these figures highlight the extensive economic linkages created by automotive production and sales.

Other key findings of this report are as follows:

### Automobile Operations-Driven Employment

- Japanese-brand automakers directly employ nearly 109,000 U.S. manufacturing, R&D/design, and other (e.g., headquarters, sales, etc.) workers.
- Another 534,000 U.S. workers are employed in intermediate goods and parts industries (“automotive supplier network”) that supply Japanese-brand automakers’ U.S. vehicle production and other facilities.
- An additional 418,000 U.S. jobs are supported by direct and intermediate employment (often referred to as “spin-off” employment).
- All told, **more than 1 million U.S. jobs are generated by Japanese-brand automakers’ investments in U.S. production facilities, R&D centers, and corporate headquarter activities.**

### Dealer Network-Driven Employment

- Approximately 370,000 U.S. workers are directly employed in the Japanese-brand automakers’ dealer network.
- Another 412,000 U.S. workers are employed in intermediate goods industries associated with the Japanese-brand automakers’ dealer network.

- An additional 501,000 U.S. spin-off jobs are supported by direct and intermediate dealership employment.
- All told, **almost 1.28 million U.S. jobs** are generated by the Japanese-brand automobile companies' dealer network.

**The Japanese-brand automakers and their dealer networks generate roughly \$221 billion in labor compensation and \$161 billion in disposable income for U.S. households.** This footprint reflects decades of sustained investment. Japanese-brand automakers have invested more than \$70 billion in U.S. facilities and now operate 26 manufacturing plants, 41 R&D centers, and 65 distribution facilities across 27 states. Approximately 75 percent of the vehicles they sell in the United States are produced in North America, and these firms account for nearly one-third of total U.S. vehicle production.

The path forward, however, requires navigating an unusually complex intersection of trade policy uncertainty, accelerating technological change, and evolving consumer demand. Recent tariffs on automobiles, steel, and aluminum have increased costs and created uncertainty for production and investment decisions. At the same time, the transition to hybrid and electric vehicles, along with advances in automation and digital technologies, is reshaping the competitive landscape and requiring significant new investment.

Despite these headwinds, the United States remains an attractive location for automotive production due to its large consumer market, skilled workforce, and well-developed supply chains. Japanese-brand automakers are deeply embedded in the U.S. economy, and their continued investment will remain an important driver of American jobs, income, and economic growth.

## I. INTRODUCTION

This study updates previous reports on the economic contribution of Japanese-brand automakers to the U.S. economy. The most recent study was performed in 2023, this report revises those estimates using 2025 data.

The analysis shows the continued growth and economic impact of Japanese-brand automakers in the United States. This report affirms the findings of the previous studies—namely, that Japanese-brand automakers are an essential source of U.S. jobs and job growth. In 2025 more than 2.34 million American jobs were rooted either directly or indirectly in Japanese-brand automakers' U.S. operations.



## II. VALUE OF THE JAPANESE-BRAND AUTOMAKERS TO THE U.S. ECONOMY

The economic performance of the automotive industry, as well as manufacturing more broadly, is essential for the continued development and growth of both the national economy and also regional economies. Manufacturing and automotive industry trends have long been important indicators of the state of the economy, with periods of growth in automotive manufacturing closely linked to periods of growth in the U.S. economy as a whole. Given the size of Japanese-brand automakers, their performance and growth are important indicators for the overall U.S. economy.

Using modeling techniques described in prior work and discussed in the appendix, estimates are derived from the economic contributions associated with the Japanese-brand automakers in the United States.<sup>1</sup> The estimates include both direct employment, intermediate jobs at parts suppliers and other upstream firms, and spin-off jobs that result from the industry’s direct and intermediate activity. The results are presented in three parts: the contributions of Japanese-brand automakers’ manufacturing and supporting operations, those associated with Japanese-brand automakers’ dealership network, and a combination of the two to represent the total impact of the Japanese-brand automakers in the United States.

## A) Manufacturing and Supporting Operations

Summary estimates of the employment contributions of Japanese-brand automotive manufacturing to the private sector of the U.S. economy for 2025 are shown in Table 1.<sup>2</sup> Both blue-collar and white-collar workers employed by the automakers are included in direct employment. The direct employees of automakers include researchers, engineers, managers, and administrative support, as well as workers on the assembly lines. According to data collected by the Japan Automobile Manufacturers Association (JAMA), 108,970 workers were employed in Japanese-brand U.S. automotive manufacturing and related operations (Table 1).<sup>3,4</sup>

Beyond those direct employees working in assembly, stamping, welding, painting, engine, battery and parts plants, R&D centers, and headquarters, many more workers in intermediate and spin-off jobs are supported through automotive production activities. The intermediate employment category captures the jobs necessary to satisfy demands for the materials and services needed to design, produce, distribute, and sell motor vehicles and is sometimes referred to as the “automotive supplier network.” Intermediate employment (suppliers of goods and services) from these automotive manufacturing activities is estimated to be 534,000 jobs, primarily in the industries necessary to produce automobiles – parts manufacturing, primary metal manufacturing, fabricated metal products manufacturing, and plastics and rubber products manufacturing. The sum of direct and intermediate jobs equals 642,970 private sector jobs.

Table 1 also reports the total spin-off jobs effect, also known as the expenditure-induced effect (spending from the people who work in direct and intermediate jobs). The estimate of the expenditure-induced effect is 418,000 jobs which, when added to the 642,970 direct plus intermediate jobs, equals 1,060,970 total jobs.

Total earnings from the 1,060,970 jobs supported by manufacturing-related and supporting operations exceed \$101 billion. From this amount, almost \$15 billion is paid in personal income taxes, and more

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- 1 Thomas J. Prusa, “The Contribution of the Japanese-Brand Automotive Industry to the United States Economy,” 2012; See also, Kim Hill, Debra Maranger Menk, Joshua Cregger, and Michael Schultz, “Contribution of the Automotive Industry to the Economies of All Fifty States and the United States,” Center for Automotive Research, January 2015; Alliance for Automotive Innovation, “The Driving Force: Annual Industry Report”, 2022, at <https://www.autosinnovate.org/resources/papers-reports/Driving%20Force%20Annual%20Report.pdf>; Autos Drive America and the American International Automobile Dealers Association (AIADA), “International Automakers and Dealers in America: Economic Impact Report” 2022, at [https://www.autosdriveamerica.org/economic-impact/2022/ADA\\_2022\\_8.5X11\\_national.pdf](https://www.autosdriveamerica.org/economic-impact/2022/ADA_2022_8.5X11_national.pdf).
  - 2 Employment represents the total number of private sector jobs, including the self-employed.
  - 3 Automakers’ contributing employment data to this study included Hino, Honda, Isuzu, Mazda, Mitsubishi Motors, Nissan, Subaru, and Toyota.
  - 4 As of December 31, 2025.

than \$15 billion is paid in contributions for government social insurance and transfer payments. The U.S. total net disposable income for individuals supported by the Japanese-brand automotive manufacturing industry is estimated at more than \$74 billion.

**Table 1: Private Sector Employment Contributions of Japanese-Brand Automobile Manufacturing and Supporting Operations in the United States, 2025**

<b>Manufacturing and Supporting Operations</b>	
<b>Employment</b>	
Total (Direct + Intermediate)	642,970
<i>Direct</i>	108,970
<i>Intermediate</i>	534,000
Spin-off	418,000
Grand Total (Direct + Intermediate + Spin-off)	<b>1,060,970</b>
<b>Compensation (\$ billions nominal)</b>	
Compensation	\$101.9
Less: transfer payments & social insurance contributions	(\$14.7)
Less: personal income taxes	(\$12.7)
Equals private disposable personal income	<b>\$74.4</b>

\* Numbers may not add due to rounding

The job estimates reported in Table 1 provide an important perspective on the growth of Japanese-brand automakers' U.S. operations. By any metric, the contributions have grown significantly.<sup>5</sup> Of particular note, direct employment has grown by more than 27,000 jobs since 2012, and the total number of jobs tied to Japanese-brand automotive manufacturing has grown by more than 378,000 since 2012.

## **B) Automotive Dealerships**

Table 2 reports the estimated employment contributions by Japanese-brand new vehicle dealer operations for 2025. Employment estimates are broken out by direct employment (people employed directly by dealerships); intermediate employment (people employed by those who provide goods and services, except inventory, to dealerships); and spin-off employment (expenditure-induced employment resulting from spending by direct and intermediate employees).

5 Thomas J. Prusa, "The Contribution of the Japanese-Brand Automotive Industry to the United States Economy – 2012 update," July 30, 2013.

Japanese-brand automakers directly employed (for new vehicle sales) 370,894 workers. As shown in Table 2, there are 412,000 intermediate jobs that support direct employment in the industry (suppliers of goods and services, excluding motor vehicle inventory). Thus, the total employment (direct and intermediate) generated by Japanese-brand automotive dealerships is 782,894 workers.

The spin-off employment associated with spending by the people who work in the direct and intermediate jobs adds another 501,000 jobs, bringing the total jobs associated with Japanese-brand new vehicle dealer operations in the United States (direct plus intermediate plus spin-off) to more than 1.28 million jobs.

Total earnings of the 1.28 million dealer network and supporting operations jobs is \$119 billion. From this amount more than \$15 billion is paid in personal income taxes, and more than \$17 billion is paid in contributions for government social insurance and transfer payments. The U.S. total net disposable income for individuals supported by the Japanese-brand automotive dealer network is estimated at more than \$87 billion.

**Table 2: Private Sector Employment Contributions of Japanese-Brand New Vehicle Dealers (Retail) in the United States, 2025**

<b>New Vehicle Dealers</b>	
<b>Employment</b>	
Total (Direct + Intermediate)	782,894
<i>Direct</i>	370,894
<i>Intermediate</i>	412,000
Spin-off	501,000
Grand Total (Direct + Intermediate + Spin-off)	<b>1,283,894</b>
<b>Compensation (\$ billions nominal)</b>	
Compensation	\$119.7
Less: transfer payments & social insurance contributions	(\$17.3)
Less: personal income taxes	(\$15.3)
Equals private disposable personal income	<b>\$87.2</b>

\* Numbers may not add due to rounding

The jobs numbers reported in Table 2 also show impressive growth of the Japanese-brand automotive dealer network. Since 2012 direct employment has grown by nearly 44,000 jobs, and the total number of jobs tied to the Japanese-brand automotive dealer network has grown by more than 605,000 since 2012.

### C) Total Contribution

Combining the estimates for Japanese-brand automakers' manufacturing and supporting operations with the estimates for Japanese-brand automotive dealer operations yields the "bottom line" for the Japanese-brand automakers. These results for the total U.S. private sector contributions from Japanese-brand automakers' activities are shown in Table 3.

The Japanese-brand automakers and their dealer networks directly employ nearly 480,000 employees – over 108,000 in vehicle production and supporting operations and over 370,000 in their new dealer vehicle networks. In turn, these 480,000 direct jobs support another 946,000 intermediate jobs (such as auto parts, raw and fabricated steel, etc.). All told, nearly 1.43 million direct and intermediate jobs are rooted in the Japanese-brand automakers' U.S. operations.

Table 3 also reports the total spin-off jobs effect, which includes the expenditure-induced effect (spending by people working in direct and intermediate jobs). The estimate of the expenditure-induced effect is 919,000 jobs. By combining this figure with the direct plus intermediate jobs, this study estimates that Japanese-brand automobile companies have a total employment effect of 2,344,864 jobs.

**Table 3: Private Sector Employment Contributions of Japanese-Brand Automakers' U.S. Operations, 2025**

	Manufacturing & Supporting Operations	New Vehicle Dealers	Total
<b>Employment</b>			
Total (Direct + Intermediate)	642,970	782,894	1,425,864
<i>Direct</i>	108,970	370,894	479,864
<i>Intermediate</i>	534,000	412,000	946,000
Spin-off	418,000	501,000	919,000
Grand Total (Direct + Intermediate + Spin-off)	<b>1,060,970</b>	<b>1,283,894</b>	<b>2,344,864</b>
<b>Compensation (\$ billions nominal)</b>			
Compensation	\$101.9	\$119.7	\$221.6
Less: transfer payments & social insurance contributions	(\$14.7)	(\$17.3)	(\$32.0)
Less: personal income taxes	(\$12.7)	(\$15.3)	(\$28.0)
Equals private disposable personal income	<b>\$74.4</b>	<b>\$87.2</b>	<b>\$161.6</b>

\* numbers may not add due to rounding

### III. U.S. AUTOMOTIVE INVESTMENT CLIMATE

Over the last four decades, the Japanese-brand automakers have established a deep-rooted manufacturing presence in the United States, with cumulative investment of more than \$70 billion in U.S. facilities. Their economic footprint is massive. In 2025, approximately 50% of the Japanese-brand automakers' vehicles sold in the U.S. were manufactured in the U.S.<sup>6</sup> Japanese-brand automakers now account for nearly one-third of all U.S. vehicle production, have operations at 26 manufacturing plants, 41 R&D facilities, and 65 distribution centers across 27 states<sup>7</sup>. Japanese-brand automakers directly employ nearly 109,000 Americans and are the economic linchpin for more than 2.3 million American jobs. As evidenced by the data in this report, the Japanese-brand automakers have, in many ways, evolved into an American success story.

Fundamentally, the United States remains a sought-after market for automotive production and sales due to its strength, diversity, and depth. These features have helped Japanese-brand automakers sustain and build upon a multi-decade track record of success. Notably, Japanese-brand automakers are facing numerous economic challenges due to rapid technological change, trade impediments, and policy uncertainty. However, many of the opportunities and challenges apply to all automakers. In this section, I will provide an overview of the challenges facing the U.S. automotive industry, including Japanese-brand automakers.

#### **The U.S. is an Attractive Investment Location**

It is undeniable that the United States remains an attractive location for the production and sale of automobiles. The U.S. has one of the world's largest and wealthiest consumer bases, providing a strong domestic market for vehicles. Additionally, the size of the U.S. market enables automakers to achieve high production volumes and significant product variety at reduced per-unit costs.

#### ***Geographic Clustering & Regional Ecosystems***

The U.S. has a deep, well-developed automotive supply chain. The U.S. has two major geographically distinct automotive ecosystems: the traditional Detroit/Midwest corridor and the Southern automotive corridor (Tennessee, Alabama, South Carolina, Kentucky). These ecosystems create efficiencies because suppliers, manufacturers, and logistics networks are in close proximity, reducing lead times and coordination costs.

#### ***Strong Manufacturing Tradition and Infrastructure***

The United States' historical manufacturing prowess is another asset. Decades of capital investment have made U.S. plants among the most productive in the world. The U.S. has significant investments and production advantages in stamping, casting, and forging capacity for structural components; advanced machining facilities for powertrain and drivetrain parts; and paint and assembly plants with high automation levels. More recently, the U.S. has attracted massive new investment in battery gigafactories (e.g., GM/Samsung SDI, Panasonic, Toyota) and electrified vehicle assembly plants.

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6 Japan Automobile Manufacturers Association internal data.

7 JAMA USA 2024 Impact Report: The Way We Work, <https://www.jama.org/2024-a-high-impact-year-for-japanese-brand-automakers-in-the-u-s/>.

### ***World's Leading Higher Education System***

The strength of the U.S. education system (abundant two- and four-year schools, as well as technical colleges) has long been a key strength for the U.S. economy, in general, and the automobile industry, in particular. For example, the U.S. is home to some of the world's premier engineering and technical universities, many of which have deep historical ties to the automotive industry. These institutions do not just supply graduates; they conduct industry-sponsored research in areas like lightweighting, battery chemistry, autonomous systems, and manufacturing processes, creating a direct pipeline between academia and the shop floor and R&D centers. The United States' network of community colleges and vocational-technical schools also benefit automakers, training precision machinists, computer numerical control (CNC) operators, welders, industrial maintenance technicians, and quality control specialists.

### ***Logistics and Transportation***

The U.S. has one of the most developed multimodal transportation systems in the world, and the automobile industry is one of its heaviest users, from rail and trucking to shipping and air freight. Several interconnected systems working together are a competitive advantage for the U.S. automobile industry.

### ***Legal System and Capital Markets***

The U.S. has a stable legal and regulatory system that encourages investment. Businesses operating in the U.S. can reasonably predict the rules of the road: property rights are enforced, contracts are honored, disputes are settled through established courts, and regulations, while sometimes complex, are generally transparent and consistent.

The U.S. also has the deepest and most liquid capital markets in the world, underpinned by a robust securities regulatory framework (i.e., SEC oversight, disclosure requirements, investor protections). This gives automotive companies, from legacy OEMs to EV startups, access to equity and debt financing, at scale. The legal framework that makes investors trust these markets is a critical enabler of that capital formation.

### **Challenges Remain**

Despite the historic and current strength of the U.S. market, both internal and external pressures have begun to impact the automotive industry, including Japanese-brand automakers, in ways that may not be apparent for years to come.

### ***Trade Policy***

Starting in 2025 and continuing into this year, all automakers operating in the U.S. have endured multiple changes in the tariff environment, causing ongoing uncertainty about various tariffs' scope, level and implementation process. These tariffs are not only imposed on vehicles imported from countries like Japan, Korea and the EU, but also upon critical inputs (parts, steel, aluminum) used in every vehicle manufactured in the U.S. The tariff uncertainty imposes costs on companies and makes supply and investment decisions difficult, slower and riskier. Uncertainty also further complicates the ability to construct three- or four-year production and development plans that are typical and required in an auto industry looking to adapt and innovate quickly. Heading into 2026, automakers who are deeply invested in U.S. manufacturing, such as many Japanese-brand automakers, also face significant, additional uncertainty as to the future of the United States-Mexico-Canada Agreement (USMCA).

## ***Technology Changes***

Layered on top of the trade policy uncertainty is a deeper, structural challenge: the automobile industry is undergoing significant technological change. It involves incorporating artificial intelligence (AI) into vehicles, product development and manufacturing processes as well as the ongoing development of automated and highly automated vehicles. While all these changes are exciting in that they can and have produced benefits already, they also present a new set of challenges, and often costs, to consider.

This rapid technological advancement within the automotive industry also includes the promulgation of hybrid and electric vehicle technology. Today, the more appropriate term might be “energy efficiency” as the choices range from internal combustion engines to hybrids to plug-in hybrids to all-electric vehicles. Several years ago, it appeared as though battery electric vehicle (BEV) technology might quickly become the preeminent propulsion system. However, federal policy changes, the removal of federal BEV sales incentives in 2025 and the need for additional charging infrastructure appears to have slowed adoption. This singular example highlights the difficulty of managing investments and product development priorities when technology and the market advance at a different pace.

## ***Workforce***

Finally, the U.S. has offered investors a healthy supply of engineers, designers, and technicians trained in automotive, mechanical, and electrical engineering. However, automakers manufacturing in the U.S. are now facing increasing shortages of skilled labor as technology advances rapidly in the automotive industry and growth outside of this sector has increased competition for skilled workers. Employer-led solutions, including ones offered by Japanese-brand automakers, to invest in developing the U.S. workforce are very important and can be impactful in the near- and long-term.<sup>8</sup>

Navigating this landscape requires addressing several issues far beyond the scope of this report including various levels of manufacturing complexity, a variety of workforce skills, consumer demand uncertainty, etc. It is a complex balancing act, and arguably one of the hardest strategic challenges automakers have ever faced.

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8 “Employer-Driven Workforce Development: Japanese-Brand Automakers In the U.S. Offer Models of Engagement,” Deanna Ross and Tamar Jacoby ([https://www.jama.org/wp-content/uploads/2025/06/JAMA\\_WorkforcePaper\\_Final.pdf](https://www.jama.org/wp-content/uploads/2025/06/JAMA_WorkforcePaper_Final.pdf)) (June 2025) (accessed April 7, 2026)

## IV. CONCLUSION

This report evaluates the economic contributions of Japanese-brand automakers to the United States economy using updated data through 2025. The findings show that these firms are a major and growing source of U.S. employment and economic activity. In total, Japanese-brand automakers and their dealership networks support approximately 2.34 million jobs, including 480,000 direct employees in manufacturing, research and development, and retail operations. These direct jobs generate substantial ripple effects, supporting an additional 946,000 jobs in the supply chain and 919,000 spin-off jobs through broader economic activity.

JAMA members' steady and robust job growth in the United States—both direct employment and the overall employment tied to JAMA members' activities—is remarkable. When specifically compared with broad manufacturing job trends in the overall economy, the manufacturing job growth tied to the Japanese-brand automakers is particularly impressive. In Figure 1, we plot the manufacturing workers directly employed by Japanese-brand automakers in the U.S. For comparison, we also plot total manufacturing employment (as reported by the U.S. Bureau of Labor Statistics).<sup>9</sup> We normalize both data series, so the 2012 value is 100. As seen, both measures grew pretty consistently until the COVID year of 2020. Since that time, the growth in manufacturing jobs at Japanese-brand automakers has significantly outpaced overall manufacturing job growth.

Direct manufacturing employment by Japanese-brand automakers has grown by over 34% since 2012. By contrast, overall U.S. manufacturing employment has increased by about 5.4% over the same period. The evidence is quite clear: Japanese-brand automakers are leading U.S. manufacturing employment growth and strengthening the country's automotive production base.

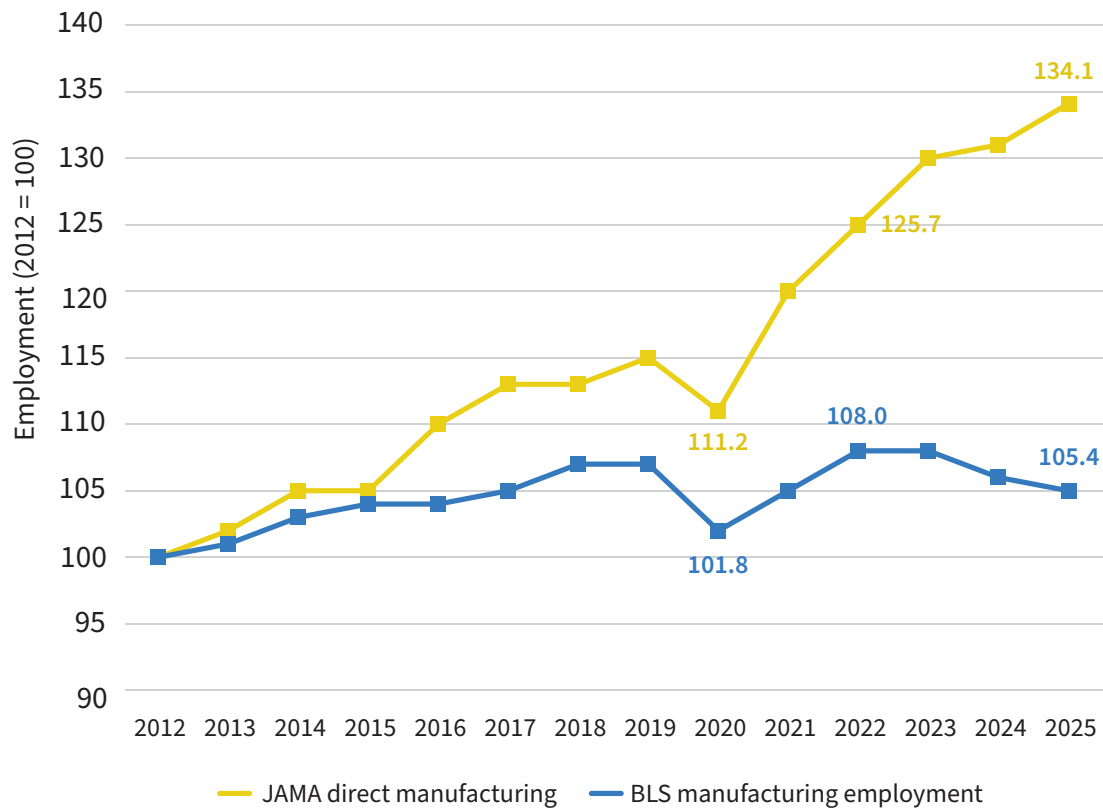


**Japanese-brand automakers are leading U.S. manufacturing employment growth and strengthening the country's automotive production base.**

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<sup>9</sup> U.S. Bureau of Labor Statistics, All Employees, Manufacturing [MANEMP], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/MANEMP> (accessed April 6, 2026).

**Figure 1: Growth in JAMA Direct Manufacturing Employment vs. Overall U.S. Manufacturing Employment**



The impact reflects decades of sustained investment and expansion in the United States. Japanese-brand automakers have invested more than \$70 billion in U.S. manufacturing facilities and now operate a broad footprint that includes 26 manufacturing plants, 41 research and development centers, and 65 distribution facilities across 27 states and today, Japanese-brand automakers account for nearly one-third of total U.S. vehicle production. Since 2012, their economic footprint has expanded significantly, with direct and intermediate employment supported by their operations, increasing by more than one million jobs.

The United States remains an attractive location for automotive production due to its large consumer market, strong educational institutions to develop a skilled workforce, well-developed supply chains, efficient transportation and logistics network and relatively stable legal and regulatory systems. However, looking forward, automakers operating in the U.S. face several challenges including increased costs and uncertainty due to trade policy, rapid technological transformation, and a skilled labor shortage. Over the last four decades of operation in the U.S., Japanese-brand automakers have demonstrated a resiliency through economic and political uncertainty and have become and continue to be key contributors to U.S. economic growth.

## EXHIBIT – STUDY METHODOLOGY

This study provides estimates of the economic contribution associated with Japanese-brand automakers in the United States. The estimates include both direct employment, intermediate jobs at parts suppliers and other upstream firms, and spin-off jobs that result from the industry’s direct and intermediate activity.

Previous versions of this study were based on economic modeling techniques developed by the Center for Automotive Research (CAR) in conjunction with data from CAR, *Ward’s Automotive*, the National Automobile Dealers Association (NADA), JAMA, and other public sources. Beginning with the 2023 update, this study is based on a more recent economic model analysis conducted by IMPLAN. The CAR and IMPLAN models are similar input-output models; they both allow one to estimate job multiplier effects. Data for new vehicle dealerships are sourced from NADA and JAMA; the dealership employment data is used to estimate the impact of Japanese-brand automakers’ U.S. new dealer networks.

One challenge of this study is that the automobile industry has deep upstream and downstream connections. The economic implications of the automotive industry’s activities extend beyond those directly employed in the industry, given the complex manufacturing supply network with many tiers of suppliers across a wide array of industries. A few of the more obvious industries supported by automotive manufacturing include motor vehicle parts, primary and fabricated metal, plastics, and rubber products. Outside of manufacturing, the automotive industry supports jobs in professional and technical services, administration services, wholesale and retail trade, transportation and warehousing, finance and insurance, and management of companies.

The IMPLAN (Impact M for Planning) system is the primary modeling tool behind the economic modeling approach used in this paper. The Input-Output (I-O) modeling approach recognizes that all industries, households, and government in the economy are connected through buy-sell relationships. Therefore, a given economic activity supports a ripple of additional economic activity throughout the economy. The IMPLAN modeling system uses annual, regional data to map these relationships, enabling one to predict how specific economic changes will impact a given regional economy or to estimate the effect of past or existing economic activity.

To estimate the total employment provided by parts suppliers, motor vehicle manufacturers, and new vehicle dealership operations, IMPLAN developed a state-level model with over 500 sectors representing private industries, government enterprises and administrative government sectors. The state-level impacts are aggregated to produce a national-level estimate.

As is standard in these types of input-output macro models, trade and production flows across industries are calibrated to allow calculation of direct and indirect employment effects. For example, the model’s inputs include measures of how much plastic, rubber, steel, aluminum, electronic components, etc., are used per vehicle. In addition, the model is calibrated to include employment measures for each of the related industries. Changes in automobile production will trigger changes in demand for the various inputs and workers.

Employment estimates are broken out by direct employment (people employed directly by automakers and dealerships), intermediate employment (people employed by suppliers to the motor vehicle industry), and spin-off employment (expenditure-induced employment resulting from spending by direct and intermediate employees).

Employment was classified into detailed job categories for the model — motor vehicle and motor vehicle parts manufacturing; management of companies; professional, scientific, and technical services; securities, commodity contracts, and investments; warehousing and storage; administrative services, facilities, and support services, and wholesale trade.

The direct employees of automakers include researchers, engineers, managers and administrative support, as well as workers on the assembly lines. Because the actual manufacturing of parts and assembly of vehicles draws on a deep supply chain for components and materials, manufacturing jobs have large upstream and downstream employment effects.

Our intermediate employment measure includes jobs in numerous manufacturing and non-manufacturing industries. Manufacturing is divided into durable goods and non-durable goods and includes items such as parts manufacturing, primary metal manufacturing, fabricated metal products manufacturing, and plastics & rubber products manufacturing. Non-manufacturing industries include administration and services, finance and insurance, management, professional and technical services, retail and wholesale trade, and transportation and warehousing.

The intermediate category captures the employment necessary to satisfy manufacturers' demands for the materials and services needed to design, produce and sell motor vehicles. This is often referred to as the automotive supplier network. This supply network consists of Tier 1 suppliers who supply parts and services directly to vehicle manufacturers, along with the lower-tier suppliers who supply the basic materials and services up to the Tier 1 group. Some of these companies supply basic commodities and can be several steps removed from the vehicle design and manufacturing process and serve multiple industries.

Spin-off jobs are associated with motor vehicle and parts manufacturing operations. These are expenditure-induced jobs created as a result of spending by the people employed in the direct and intermediate categories. Said differently, when employees use their paychecks to purchase goods (for example: electronics equipment, clothing, food, and even new automobiles), employment is created to supply their demands.

New auto dealerships also have large economic effects. Similar in spirit to the input-output model derived for automobile production, the economic model captures the interconnections from new auto sales throughout the economy. As with automotive production, the job impact includes direct, intermediate, and spin-off jobs. Categories related to intermediate and spin-off jobs include office administrative & business support services; facilities support services; accounting, tax preparation, bookkeeping, and payroll services; advertising and related services; architectural, engineering, and related services; computer systems design and related services; legal services; finance, insurance; transportation and warehousing; truck transportation; and warehousing and storage.



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