

**The Contributions of Japanese-Brand
Automakers to the United States Economy:**

2017 Update

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** All statements, findings, and conclusions in this report are those of the author and do not necessarily reflect those of the Japan Automobile Manufacturers Association.

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Automakers to the United States Economy:
2017 Update**

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Executive Summary

For the last 37 years, the Japanese-brand automotive industry has been a major contributor in shaping U.S. manufacturing and has generated and supported millions of U.S. jobs. As of late 2017, Japanese-brand automakers directly employed more than 92,000 workers while their dealer network employed more than 355,000 workers. The consistent *growth* of Japanese-brand automakers' U.S.-based employment is even more notable. In *every* year since our original 2011 study, direct and indirect employment supported by Japanese-brand automobile producers and dealers has grown. For instance, **since 2011 Japanese-brand automobile producers and dealers increased their direct employment by 27.6%** and 12.7%, respectively. The total number of jobs generated by Japanese-brand automobile companies and their dealership networks has grown by 18.8% since 2011. Today more than 1.52 million U.S. jobs are supported by the Japanese-brand automobile companies' U.S. production facilities, R&D/design centers, headquarters, sales/distribution and dealer networks – an increase of more than 240,000 jobs since our original study in 2011. The industry generates over \$109 billion in worker compensation, which in turn results in more than \$16 billion in personal income taxes to the federal government.

The key findings of this report are as follows:

- **Automobile Production-Driven Employment**
 - Japanese-brand automobile companies directly employ over 92,000 U.S. manufacturing, R&D/design, and other (e.g. headquarters, sales, etc.) workers.
 - Another 250,000 U.S. workers are employed in intermediate goods and parts industries (“automotive supplier network”) that supply the Japanese-brand automakers’ U.S. vehicle production and other facilities.
 - An additional 439,000 U.S. jobs are supported by direct and intermediate employment (often referred to as “spin-off” employment).
 - All told, **more than 781,000 U.S. jobs are generated by the Japanese-brand automobile companies’ U.S. production facilities, R&D centers and headquarters.**

- **Dealer Network-Driven Employment**
 - Approximately 355,000 U.S. workers are directly employed in the Japanese-brand automobile companies’ dealer network.
 - Another 116,000 U.S. workers are employed in intermediate goods industries associated with the Japanese-brand automakers’ dealer network.
 - An additional 267,000 U.S. spin-off jobs are supported by direct and intermediate dealership employment.
 - All told, **more than 738,000 U.S. jobs are generated by the Japanese-brand automobile companies’ dealer network.**

- In total, the **Japanese-brand automobile companies’ U.S. facilities and dealer networks contribute to more than 1.52 million private sector U.S. jobs.** The Japanese-brand automobile companies remain among the largest job creators in the United States.

- **Total annual compensation via the jobs created by Japanese-brand automobile companies in the United States exceeds \$109 billion.**

- Personal income taxes from these jobs are estimated to be nearly \$16 billion.

I. Introduction

This study updates previous reports on the economic contribution of the Japanese-brand automotive industry to the U.S. economy. Earlier studies estimated the employment and economic impact for each year 2011 through 2015; this report revises those estimates using 2017 data.

The analysis shows the continued growth and significance of the Japanese-brand automotive industry in the United States. This report affirms the findings of the previous studies – namely, that the Japanese-brand automotive companies are an important source of U.S. jobs and job growth. In 2017 more than 1.52 million American jobs were rooted either directly or indirectly in the Japanese-brand automotive companies' U.S. operations. These jobs are estimated to have contributed more than \$109 billion in labor compensation in 2017.

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 important 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 the Japanese-brand automobile producers, 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.¹ The estimates include both direct employment and payroll, intermediate jobs at parts suppliers and other upstream firms, and spin-off jobs and compensation that result from the industry's direct and intermediate activity. The results are presented in three parts: the contributions of Japanese-brand automotive manufacturing, those associated with Japanese-brand new vehicle retail activities, and a combination of the two to represent the total impact of the Japanese-brand automakers in the United States.

A) Vehicle Manufacturer Activities

Summary estimates of the employment and income contributions of Japanese-brand automotive manufacturing to the private sector of the U.S. economy for 2017 are shown in Table 1.² Both blue-collar and white-collar workers employed by the manufacturing firms 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, 92,710 workers were employed in Japanese-brand U.S. automotive manufacturing and related operations (Table 1).^{3,4}

Beyond those direct employees working in assembly, stamping, welding, painting, engine, and parts plants, R&D centers and headquarters, there are many more workers in intermediate and spin-off jobs that are supported through automotive production activities. The intermediate employment category captures the jobs

¹ Thomas J. Prusa, "The Contribution of the Japanese-Brand Automotive Industry to the United States Economy," May 6, 2013; 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.

² Employment represents the total number of private sector jobs, including the self-employed. Compensation in the private sector consists of wage and salary disbursements, fringe benefits, and net incomes of owners of unincorporated businesses.

³ Automakers' contribution employment data to this study included Hino, Honda, Isuzu, Mazda, Mitsubishi, Nissan, Subaru, and Toyota.

⁴ As of December 31, 2017.

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 250,000 jobs, primarily in the industries necessary to produce automobiles – parts manufacturing, primary metal manufacturing, fabricated metal products manufacturing, and plastics and rubber products manufacturing.⁵ The sum of direct and intermediate jobs equals 342,710 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 the direct and intermediate jobs). The estimate of the expenditure-induced effect is 439,000 jobs which, when added to the 342,710 direct plus intermediate jobs, equals 781,710 total jobs.

⁵ Estimates of intermediate and spin-off employment are rounded to the nearest thousand; income and tax receipt numbers are also rounded. Sub-totals may not sum to total due to rounding.

Table 1: Private Sector Contributions of Japanese-Brand Automobile Manufacturing in the United States, 2017

		2011-2017	
		<u>Change</u>	<u>Pct Change</u>
Employment			
Total (Direct + Intermediate)	342,710	+68,687	25.1%
<i>Direct</i>	92,710	+20,037	27.6%
<i>Intermediate</i>	250,000	+48,650	24.2%
Spin-off	439,000	+87,684	25.0%
Grand Total (Direct + Intermediate + Spin-off)	781,710	+156,371	25.0%
Compensation (\$ billions nominal)			
Compensation	\$55.55	+\$14.55	35.5%
Less: transfer payments & social insurance contributions	(\$7.15)	(\$2.19)	43.7%
Less: personal income taxes	(\$7.62)	(\$1.80)	31.1%
Equals private disposable personal income	\$40.77	+\$10.66	35.4%

Compensation in the private sector associated with the total jobs (direct plus intermediate plus spin-off) amounts to \$55.5 billion. This estimate of compensation is prior to deductions for personal income taxes and contributions to social insurance programs and does not subtract transfer payments. Transfer payments and social insurance contributions amount to \$7.15 billion and personal income tax revenues amount to \$7.62 billion. Disposable personal income, or personal income after taxes and subtraction of transfers and contributions, is estimated to be \$40.77 billion.

B) Automobile Dealerships

Table 2 reports the estimated employment contributions by Japanese-brand new vehicle dealer operations for 2017. Employment estimates are broken out by direct employment (people employed directly by dealerships); intermediate employment (people employed by those who provide goods and services, excepting inventory, to dealerships); and spin-off employment (expenditure-induced employment resulting from spending by direct and intermediate employees).

Japanese-brand automotive dealerships directly employed (for new vehicle sales) 355,720 workers. As can be seen in Table 2 there are 116,000 intermediate jobs that support direct employment in the industry (suppliers of goods and services, not including motor vehicle inventory). Thus, the total employment (direct and intermediate) generated by Japanese-brand automotive dealerships is 471,720 workers.

The spin-off employment associated with spending by the people who work in the direct and intermediate jobs adds another 267,000 jobs, bringing the total jobs associated with Japanese-brand new motor vehicle retail operations in the United States (direct plus intermediate plus spin-off) to more than 738,000 jobs.

Table 2: Private Sector Contributions of Japanese-Brand New Vehicle Dealers (Retail) in the United States, 2017

		2011-2017	
		<u>Change</u>	<u>Pct Change</u>
Employment			
Total (Direct + Intermediate)	471,720	+53,638	12.8%
<i>Direct</i>	355,720	+40,137	12.7%
<i>Intermediate</i>	116,000	+13,501	13.2%
Spin-off	267,000	+30,469	12.9%
Grand Total (Direct + Intermediate + Spin-off)	738,720	+84,108	12.8%
Compensation (\$ billions nominal)			
Compensation	\$53.71	+\$14.90	38.4%
Less: transfer payments & social insurance contributions	(\$7.36)	(\$3.24)	77.9%
Less: personal income taxes	(\$8.98)	(\$3.24)	56.4%
Equals private disposable personal income	\$37.36	+\$8.52	29.5%

** numbers may not add due to rounding*

The bottom panel of Table 2 reports the estimates for compensation in the private sector associated with total jobs (direct plus intermediate plus spin-off), which amounts to nearly \$54 billion. The estimate of compensation is prior to deductions for personal income taxes and contributions to social insurance programs, and does not include transfer payments. As shown, a reduction in transfer payments and social insurance contributions of \$7.36 billion is associated with new Japanese-brand vehicle dealer activity, and personal income tax revenues are increased by \$8.98 billion. The implication for disposable personal income, or personal income after taxes and subtraction of transfers and contributions, is an increase of \$37.36 billion in the domestic economy.

C) Total Contribution

Combining the estimates for Japanese-brand automotive production with the estimates for Japanese-brand vehicle dealer operations yields the “bottom line” for the Japanese-brand automakers as a whole. These results for the total U.S. private sector contributions from Japanese-brand automaker activities are shown in Table 3.

The Japanese-brand automobile manufacturers and their dealer networks directly employ more than 448,000 employees –over 92,000 in the production and distribution of their U.S.-built automobiles and over 355,000 in their new dealer vehicle networks. In turn, these 448,000 direct jobs support another 366,000 intermediate jobs (such as auto parts, raw and fabricated steel, etc.). All told, over 814,000 direct and intermediate jobs are rooted in the Japanese-brand automobile companies’ U.S. production and sales.

Table 3 also reports the total spin-off jobs effect, which includes the expenditure-induced effect (spending from the people who work in the direct and intermediate jobs). The estimate of the expenditure-induced effect is 706,000 jobs. By combining this figure with the direct plus intermediate jobs, this study estimates the Japanese-brand automobile companies have a total employment effect of 1,520,430 jobs.

Compensation in the private sector associated with total jobs (direct plus intermediate plus spin-off) amounts to more than \$109 billion. As mentioned earlier, the estimate of compensation is prior to deductions for personal income taxes and contributions to social insurance programs, and does not include transfer payments. As shown in the bottom panel of Table 3, a reduction in transfer payments of more than \$14 billion is associated with automotive manufacturing activity, and personal income tax revenues are increased by more than \$16 billion. On net, disposable personal income, or personal income after taxes and including transfers, is increased by more than \$78 billion in the domestic economy.

Table 3: Private Sector Contributions of Japanese-Brand Automobile Activity, 2017

	<u>Production</u>	<u>New Vehicle Dealers</u>	<u>Total</u>
Employment			
Total (Direct + Intermediate)	342,710	471,720	814,430
<i>Direct</i>	92,710	355,720	448,430
<i>Intermediate</i>	250,000	116,000	366,000
Spin-off	439,000	267,000	706,000
Grand Total (Direct + Intermediate + Spin-off)	781,710	738,720	1,520,430
Compensation (\$ billions nominal)			
Compensation	\$55.55	\$53.71	\$109.25
Less: transfer payments & social insurance contributions	(\$7.15)	(\$7.36)	(\$14.52)
Less: personal income taxes	(\$7.62)	(\$8.98)	(\$16.60)
Equals private disposable personal income	\$40.77	\$37.36	\$78.14

* *numbers may not add due to rounding*

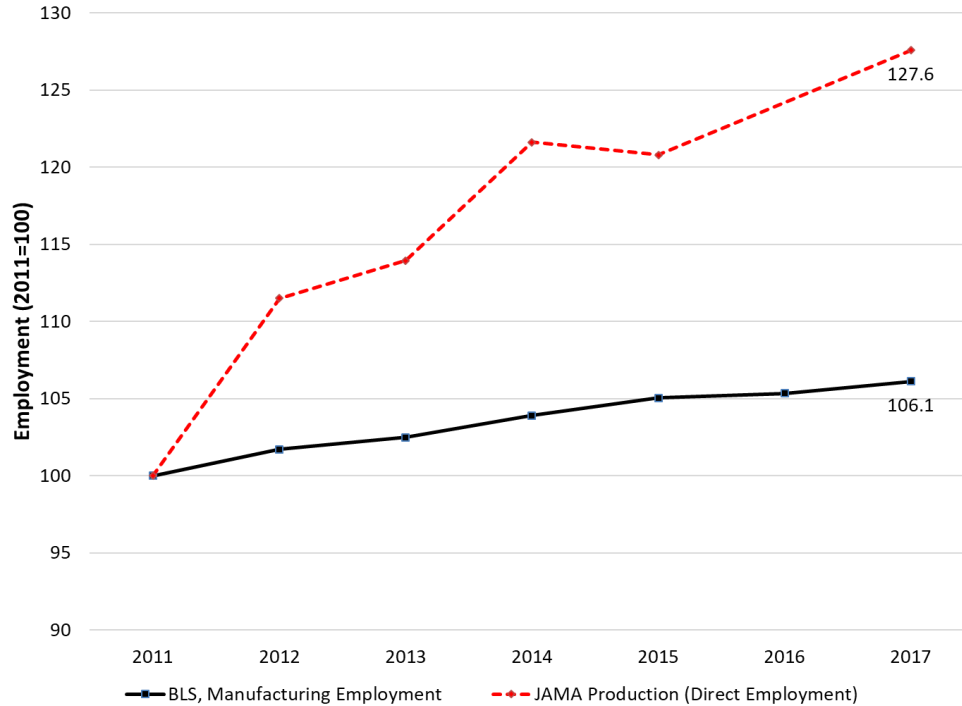
III. Concluding Comments

This study highlights the continued economic importance of the Japanese-brand automakers' U.S.-based production. Consistent with the findings of our previous studies, we again find that Japanese-brand automakers' economic contributions grew in 2017: today more than 1.52 million U.S. jobs are tied to Japanese-brand automakers.

The steady and robust job growth by the Japan Automobile Manufacturers Association (JAMA) member companies – both direct employment and also the overall employment tied to JAMA members’ activity – is quite remarkable, especially when compared with broad job trends in the overall economy. In Figure 1 we plot the production workers directly employed by Japanese-brand automobile companies in the U.S. (e.g., manufacturing, R&D/design, headquarters, sales, etc.). For comparison, we also plot total manufacturing employment (as reported by the U.S. Government).⁶ We normalize both data series so the value for 2011 is 100. As seen, direct employment by Japanese-brand automobile companies has grown by more than 27.6% since 2011. By contrast, overall U.S. manufacturing employment has increased 6% over the same period. The old saying “a picture is worth 1,000 words” has never been more true – in this case, Japanese-brand automakers are leading U.S. manufacturing employment growth and strengthening the country’s automotive production base.

⁶ All Manufacturing employees, Bureau of Labor Statistics, <http://data.bls.gov/>.

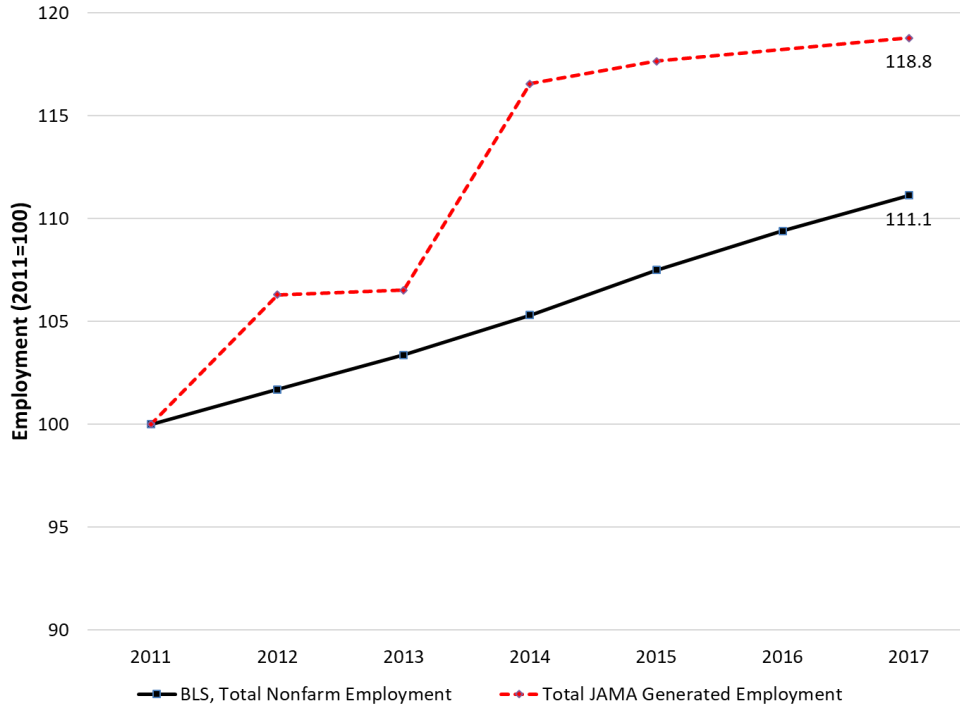
Figure 1: Growth in Direct Production Employment



An important lesson from this series of “contributions” studies is that Japanese-brand automobile companies’ activity in the U.S. goes far beyond the factory floor. Most obviously, there is the direct employment in automobile dealerships. As described above, there are also thousands of intermediate and spin-off jobs generated by Japanese-brand automobile companies’ activities in the U.S. In Figure 2 we plot total employment and compare it with the trend in overall U.S. employment.⁷ We again normalize both data series so the value for 2011 is 100. As seen, we see that the growth in overall jobs related to JAMA member company activity exceeds the growth in overall U.S. employment. Since 2011 total employment generated by Japanese-brand automobile companies’ activities has grown by nearly 19% whereas overall U.S. employment has grown by about 11%.

⁷ Total nonfarm employees, Bureau of Labor Statistics, <http://data.bls.gov/>.

Figure 2: Growth in Total Employment



Employment is not the only reflection of the growing impact of Japanese-brand automobile companies' activity in the U.S. For instance, I estimate total compensation in 2017 was over \$109 billion. This represents a 36.9% increase in compensation since 2011. This is more than twice the growth in compensation for all U.S. workers.⁸

In every respect the last seven years have been a very strong period for both the Japanese-brand automobile companies and also the overall U.S. economy. As the comparison with the BLS official employment statistics has shown, Japanese-brand automobile companies are playing a leading role in the growth of the U.S. economy.

⁸ Bureau of Economic Analysis, Compensation of Employees by Industry, <http://www.bea.gov> .

Exhibit – Contributions of Japanese-Brand Automakers to the United States Economy

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

The study is based on economic modeling techniques developed by CAR in conjunction with data from CAR, *Ward's Automotive*, the National Automobile Dealers Association, the Japan Automobile Manufacturers Association and other public sources. Data for new vehicle dealerships is sourced from the National Automobile Dealers Association and the Japan Automobile Manufacturers Association; the dealership employment data is used to estimate the impact of the Japanese-branded automakers' U.S. new dealer networks.

One challenge of this study is the automobile industry has deep upstream and downstream connections. The economic implications of the automotive industry's activities extend beyond people directly employed in the industry, due to 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 and services, wholesale and retail trade, transportation and warehousing, finance and insurance, and management of companies.

The Center for Automobile Research (CAR) was the primary force behind the economic modeling approach used in this paper. CAR has spent more than two

decades developing and refining models to measure the economic impact of automobile production and automobile sales. To estimate the total employment and compensation provided by parts suppliers, motor vehicle assemblers and new vehicle dealership operations, CAR developed a state-level model with over 150 related industrial sectors. The state-level impacts are aggregated to produce an estimate for the national economy.

As is standard in these type of input-output macro models, trade and production flows across industries are calibrated to allow one to calculate 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 measures of employment in 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 automotive companies), 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 a 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 assemblers along with the lower-tier suppliers who supply the basic materials and services 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 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 auto 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.