

Chapter 4 Transport Equipment Sector

4-1 Automobiles (Four-wheel Vehicles)

4-1-1 Supply and demand trends

(1) Overview

As Japan's economy continues down the road to recovery, the Japanese automobile industry has attracted considerable media attention due to the favorable performance of its players. Japanese automakers have implemented a number of measures, such as the "Nissan Revival Plan," designed to recover and strengthen global competitiveness. Nevertheless, conditions in the

global market remain severe and numerous problems continue to mount, such as those concerning the environment, safety, and crude oil prices.

In this section, we will attempt to determine the direction in which Japanese automobile industry is headed based on current trends and conditions that exist within the industry.

(2) Domestic production, sales, and registrations

The number of automobiles manufactured by Japanese automakers has hovered around 10 million units per year for the past three years, and annual output shows signs of increasing. Diagram 4-1-1, which shows domestic production according to vehicle type, indicates that output, which was in decline in 2001, began to recover thereafter and reached 10.51 million units in 2004. This recovery can be attributed to an increase in production of passenger cars.

An examination of the breakdown of passenger cars shows that production of large passenger cars is increasing. For example, production has steadily risen since 2000, and increased from roughly 3.75 million units in 2003 to 4.04 million units in 2004. Part of the reason for this increase in production is 1) the recovering trend in the Japanese economy, which has driven demand for large passenger cars, and 2) the unveiling of new car models in 2004.

Production of small passenger cars, which has been in decline since 2002, decreased from roughly 3.43 million units in 2003 to 3.31 million units in 2004. This decline is considered to be the result of a dearth of new models being introduced.

Production of midget passenger cars in 2004 reached approximately 1.37 million units. Although production had been in decline since the 2002-2003 period, output rose by roughly 76,000 units in 2004; this rebound can be attributed to the introduction of new models.

Production of trucks in 2004 amounted to roughly 1.73 million units – a decrease of about 16,000 units compared to 2003 figures. Implementation of environmental restrictions on vehicles with diesel engines drove purchases of new vehicles in 2003 and in turn created a temporary spike in production. This is likely the reason behind the decline in 2004.

An examination of the breakdown of trucks shows that production of large trucks in 2004 amounted to roughly 770,000 units – almost the same as in 2003. The same may be said for small and midget trucks. Overall, production of trucks appears to be in decline.

Bus production, which changed little from 2003, totaled roughly 60,000 units in 2004. While production of small buses in 2004 seems to have decreased somewhat, this may also be attributable to the same environmental restrictions that created a spike in large truck production in 2003.

Diagram 4-1-1 Automobile production in Japan by vehicle type

(Unit: 1 unit)

	Passenger Cars				Trucks			
	Large	Small	Midget	Subtotal	Large	Small	Midget	Subtotal
2000	3,376,447	3,699,893	1,283,094	8,359,434	649,180	483,282	594,356	1,726,818
2001	3,460,006	3,378,915	1,278,642	8,117,563	595,403	445,270	560,863	1,601,536
2002	3,671,026	3,637,501	1,309,830	8,618,357	679,964	380,303	512,373	1,572,640
2003	3,753,446	3,434,662	1,290,220	8,478,328	773,027	449,462	524,427	1,746,916
2004	4,044,563	3,309,147	1,366,675	8,720,385	769,953	446,536	514,202	1,730,691

	Buses			Total
	Large	Small	Subtotal	
2000	8,035	46,509	54,544	10,140,796
2001	11,205	46,887	58,092	9,777,191
2002	11,141	55,180	66,321	10,257,318
2003	11,406	49,668	61,074	10,286,318
2004	12,286	48,156	60,442	10,511,518

Source: Japan Automobile Manufacturers Association, Inc. (JAMA) statistics

Diagram 4-1-2 Automobile production in Japan by automaker

(Unit: 1 unit)

	Toyota	Nissan	Mazda	Mitsubishi	Mitsubishi Fuso	Isuzu	Daihatsu	Honda
2000	3,429,209	1,324,427	778,140	997,270	-	257,539	679,383	1,223,924
2001	3,354,424	1,270,288	729,279	834,749	-	215,929	638,887	1,284,707
2002	3,485,171	1,392,439	773,418	871,304	-	231,053	599,541	1,386,379
2003	3,520,317	1,471,595	801,084	749,371	132,745	244,575	641,236	1,170,941
2004	3,680,946	1,439,007	818,730	639,883	120,118	218,352	679,485	1,242,528

	Fuji	Nissan Diesel	Hino	Suzuki	GM Japan	Other	Total
2000	469,080	25,581	47,978	907,905	0	360	10,140,796
2001	462,883	24,153	53,435	907,528	492	437	9,777,191
2002	436,355	26,768	54,170	999,880	241	599	10,257,318
2003	450,062	38,848	83,122	980,731	1,012	679	10,286,318
2004	491,792	40,107	93,837	1,045,735	-	998	10,511,518

Source: Japan Automobile Manufacturers Association, Inc. (JAMA) statistics

Based on the data shown in Diagram 4-1-2, we may conclude that Japanese automakers in general are enjoying increased production. Nissan, on the other hand, actually saw production decrease slightly from 1.47 million units in 2003 to 1.44 million units in 2004; this may be the result of a temporary suspension of operations at three of its plants in November 2004. The Mitsubishi Group experienced a sharp decline in production due to a series of recalls.

Diagram 4-1-3 shows automobile sales and registration data by vehicle type. Although sales were down in 2002, they recovered in 2003 and rose to roughly 5.85 million units in 2004, a

30,000-unit increase over the 2003 sales. An examination of the breakdown of automobile sales shows that passenger car sales in 2004 increased by roughly 50,000 units for an approximate total of 4.77 million units. Specifically, sales of large passenger cars (approx. 1.36 million units) and midget passenger cars (approx. 1.37 million units) increased while sales of small passenger cars (approx. 2.04 million units) decreased. Although the introduction of new models had a positive effect on large and midget passenger cars, the effect on small passenger car sales was relatively low.

Sales of trucks in 2004 fell slightly to around 1.07 million units. The Law Concerning Special Measures to Reduce the Total Amount of Nitrogen Oxides and Particulate Matter Emitted from Motor Vehicles in Specified Areas (Automotive NOx and PM Law) and driving restrictions on diesel vehicles in the Tokyo metropolitan area created a sales spike in 2003.

Trends in bus sales were similar to those of truck sales. Sales in 2004 fell roughly 3,000 units to a total of around 18,000 units. This may also be attributed to the Automotive NOx and PM Law diesel restrictions enacted in 2003, which created a short-term spike in sales.

Diagram 4-1-3 Automobile sales & registrations in Japan by vehicle type

(Unit: 1 unit)

	Passenger Cars				Trucks			
	Large	Small	Midget	Subtotal	Large	Small	Midget	Subtotal
2000	770,220	2,208,387	1,281,265	4,259,872	84,626	1,015,313	586,660	1,686,599
2001	741,489	2,274,996	1,273,198	4,289,683	83,038	943,591	574,227	1,600,856
2002	674,094	2,460,103	1,307,157	4,441,354	76,035	739,502	518,843	1,334,380
2003	1,229,907	2,194,194	1,291,819	4,715,920	208,752	373,259	509,044	1,091,055
2004	1,358,281	2,037,767	1,372,083	4,768,131	186,588	361,449	519,067	1,067,104

	Buses			Total
	Large	Small	Subtotal	
2000	4,333	12,238	16,571	5,963,042
2001	4,420	11,512	15,932	5,906,471
2002	4,729	11,630	16,359	5,792,093
2003	5,862	15,341	21,203	5,828,178
2004	5,098	13,049	18,147	5,853,382

Note: After January 2003, classification of sales statistics was changed from chassis-based to registration-number based. There is no continuity between chassis- and registration-number-based statistics.

Source: Japan Automobile Manufacturers Association, Inc. (JAMA) statistics

Diagram 4-1-4 Automobile sales & registrations by Japanese automaker

(Unit: 1 unit)

	Toyota	Nissan	Mazda	Mitsubishi	Mitsubishi Fuso	Isuzu	Daihatsu	Honda
2000	1,763,595	729,737	313,304	543,369	-	69,849	549,171	754,827
2001	1,713,271	731,628	281,352	487,655	-	60,573	542,024	854,035
2002	1,675,213	773,741	263,081	416,387	-	54,727	504,596	892,868
2003	1,704,717	825,090	277,783	367,039	87,504	86,104	541,855	715,119
2004	1,759,003	826,879	280,583	255,240	73,293	80,979	577,809	743,133

	Fuji	Nissan Diesel	Hino	Suzuki	GM Japan	Other	Total
2000	300,814	16,494	32,355	614,075	0	275,452	5,963,042
2001	287,264	16,326	34,361	622,057	118	275,807	5,906,471
2002	255,375	15,694	33,210	626,090	522	280,589	5,792,093
2003	243,824	22,245	47,874	626,873	1,226	280,928	5,828,178
2004	278,423	19,704	50,902	662,135		245,299	5,853,382

Notes: 1. After January 2003, classification of sales statistics was changed from chassis-based to registration-number based. There is no continuity between chassis- and registration-number-based statistics.

2. As of January 2004, registered vehicle sales data will no longer be categorized by automaker but instead by vehicle brand. (Cars manufactured overseas by companies that have up until January 2004 been included in the "Other" category will be included in registered vehicle statistics for Japanese automakers.) There is no continuity between pre- and post-2004 statistics. "Other" indicates sales for brands that are not otherwise displayed.

Source: Japan Automobile Manufacturers Association, Inc. (JAMA) statistics

The data in Diagram 4-1-4 shows that passenger cars also performed well in the area sales, and that, with the exception of Hino, sales of commercial vehicles suffered. The Mitsubishi Group in particular saw sales of its automobiles drop significantly as a result of a series of recalls. Toyota, on the other hand, continued to enjoy favorable sales, which accounted for 30% of overall industry sales and registrations; in fact, combined sales of the three Toyota Group companies accounted for more than 40% of overall industry sales.

Diagram 4-1-5 ranks Japanese five top models based on sales and vehicle registrations. It should be pointed out that, although production and sales of large passenger cars were on

the increase, they did not appear in the top five. In other words, while demand is diversifying across a broad range of vehicle types, it is at the same time concentrating around small and midget passenger cars. In fact, the top-ranking models in Diagram 4-1-5 are midget passenger cars. The Suzuki Wagon R and the Honda Life are thought to have ranked high because new models were unveiled in 2004. The Toyota Corolla and the Honda Fit are thought to have ranked lower in 2004 than 2003 because consumers are still waiting for new models to be introduced.

Diagram 4-1-5 Top five models based on domestic sales and vehicle registrations

(Unit: 1 unit)

	2004			2003		
	Model	Maker	No. of Registrations	Model	Maker	No. of Registrations
1	Wagon R	Suzuki	211,929	Corolla	Toyota	198,904
2	Move	Daihatsu	186,780	Move	Daihatsu	187,545
3	Corolla	Toyota	173,301	Fit	Honda	182,285
4	Life	Honda	159,055	Wagon R	Suzuki	177,151
5	Fit	Honda	149,503	Wish	Toyota	158,658

Note: Shadowed models are midget passenger cars.

Source: The "Toyota Outlook 2004" report, published by Toyota Motor Corporation.

As discussed above, the Japanese auto market is expanding due to increased production and sales of large passenger cars. While it is unlikely that the market will explode anytime in the foreseeable future, Japanese automakers will continue to implement strategies for expanding sales of highly profitable large passenger cars. Toyota, for example, has introduced its luxury brand, Lexus, into the Japanese market and developed a

sales network. Nissan, too, will in the near future introduce its own high-end brand, Infiniti, in an effort to capture a larger segment of the market. It will be very interesting to see how far Japanese automakers will be able to boost sales of large passenger cars in the future. Industry watchers expect to see a heated competition develop with European luxury car manufacturers.

(3) Exports & imports

Diagram 4-1-6 shows export data for the years 2000 through 2004. Overall, exports totaled roughly 4.96 million units and continued an increasing trend. An examination of the breakdown by region shows that, in addition to

Europe, exports to developing markets such as Central and South America and Africa are on the rise, which is likely due to economic growth in these regions. Exports to North America, how-

ever, continued to decline for the second year in a row.

While exports to Europe had been in a slump up, this year's increase is thought to have been a result of the efforts of Japanese auto-makers to capture a larger portion of the market; consequently, Japanese cars are gaining popularity in the region.

In Central America, the Free Trade Agreement (FTA) between Japan and the United Mexican States is considered to have helped boost exports to that region. Before the FTA was established, Japanese automakers thought themselves to be at a disadvantage with respect to their overseas rivals; the FTA enabled them to compete with their rivals on equal footing, and consequently helped to increase exports to Central America.

The increase of exports to South America may be attributed to economic growth in the re-

gion. As Brazil is a member of BRICs and therefore expected to experience economic growth in the future, industry watchers will be paying close attention to market trends there.

Diagram 4-1-7 shows import data for the years 1999 through 2004. Overall, imports totaled roughly 300,000 units and have continued to increase slightly since 2003. An examination of the breakdown by country shows that imports from Europe are on the rise. While sales of such passenger cars as Volkswagen and Mercedes-Benz have flattened out, BMW and other makers have seen Japan sales increase. Imports from other regions have either flattened out or are in decline. Therefore, the slight overall increase of imports may be attributed to increased imports of European cars.

Diagram 4-1-6 Japanese car exports by region

	Asia	Middle East	Europe		North America	
			EU		United States	
2000	410,599	295,176	973,076	1,136,083	1,669,047	1,836,941
2001	351,227	381,965	780,750	895,415	1,606,998	1,795,816
2002	426,692	419,274	837,639	949,699	1,841,635	2,076,296
2003	524,094	439,587	988,523	1,159,706	1,594,152	1,786,382
2004	510,939	457,406	1,036,127	1,275,229	1,559,607	1,726,465

	Central America	South America	Africa	Asia-Pacific	Other	Total
2000	124,267	174,534	110,218	357,739	9,337	4,454,894
2001	109,390	184,166	98,524	341,808	7,778	4,166,089
2002	142,807	144,358	144,979	385,455	9,166	4,698,726
2003	153,912	118,385	146,269	418,202	9,802	4,756,339
2004	186,930	157,914	182,451	448,671	11,658	4,957,663

Note: Statistics for the 25 European Union nations were compiled from May 2004.

Source: Japan Automobile Manufacturers Association, Inc. (JAMA) statistics

Diagram 4-1-7 Foreign car imports by region

	Asia/ Middle East	Europe		North America		Central America	Africa	Asia- Pacific/ Other	Total
		EU		United States					
1999	1,112	196,908	196,977	51,595	56,428	4,840	16	1,888	261,261
2000	1,710	203,038	213,166	46,194	50,939	17,536	5,716	1,684	290,751
2001	8,293	198,677	215,880	33,967	38,606	17,681	13,397	122	293,979
2002	12,852	202,402	215,921	31,302	34,562	14,574	18,346	98	296,353
2003	21,395	181,022	187,122	26,100	28,585	11,755	40,201	111	289,169
2004	14,679	208,097	208,137	26,790	28,237	8,249	37,105	119	296,526

Note: Statistics for the 25 European Union nations were compiled from 2004.

Source: Automobile Yearbook, Japan Automobile Manufacturers Association, Inc. (JAMA) and other publications

Even more than the recovering trend in the Japanese economy, the increase of imports from Europe to Japan is thought to be the result of European automakers' efforts to expand sales of their cars in the Japanese market; these efforts were undertaken before Japanese automakers began developing their own luxury car dealer

networks. Once these Japanese dealer networks had been established, Lexus and Infiniti would be able to recover a share of the market from their European rivals, which had theretofore held a considerable share. Industry watchers believe that this will have an adverse effect on European car imports in the future.

4-1-2 Maintaining a strong position in global market

Japanese automakers are taking aggressive measures to boost production on a global scale. In addition to increasing the output at existing overseas plants in Europe, North America, and Asia, they are also working to establish new production bases and expand output at existing plants in India, Russia, South America, and other developing markets. All of these efforts are designed to solidify the dominant position of Japanese automakers in the global market.

Toyota, for example, has announced that it will build a new manufacturing plant in Canada that will enable the company to boost its annual North American output to as much as 2.50 million units when it becomes operational. The company is also has plans to boost production in emerging markets. As part of its Innovative/International Multipurpose Vehicle (IMV) Project, Toyota is now increasing production at its Southeast Asian plants in Thailand and Indonesia, and is manufacturing the same car models at its plants in Argentina and South Africa. In China, the company has already begun manufac-

turing cars at plants in Tianjin, Sichuan, and other regions, and has announced that it will set up new operations in Guangzhou as well. It has also announced that it will soon start manufacturing cars in Russia, and will establish joint manufacturing operations with Daihatsu in India. Thus, Toyota is expanding its global production activity. Other Japanese automakers are taking the same global measures. Local production of Japanese automakers in the global market seems to be more critical.

Toyota also announced that it would be raising the prices of its cars in the U.S. market. While this move is often attributed to the rising cost of raw materials, others attribute it to an effort on Toyota's part to help America's struggling "Big Three" automakers to recover from their slump. While many have criticized Toyota for the price increase, others defend it by saying the company, as an automaker and representative of Japanese global corporations, is simply trying to prevent any new trade friction with the U.S. from occurring.

Toyota is also making plans to manufacture its Prius hybrid car overseas. It has already announced its intention to start producing them in the U.S. and China. As environment-related issues continue to mount, the move is seen as one of Toyota's contributions toward alleviating the burden on the natural environment.

As the strength of Japanese automakers in the global market continues to rise, they have

4-1-3 Future prospects and challenges

The introduction of environmentally-friendly technology, "intelligent" cars, globally competitive pricing, and other measures are all increasingly important challenges that Japanese automakers are working on. As for the introduction of environmentally-friendly technology, industry watchers are anticipating the implementation of the world's strictest emission restrictions in 2009, and automakers are working to develop cars that will be able to comply with these new restrictions. Fuel cell cars have yet to gain in popularity and will likely remain so until a myriad of issues are resolved, thereby allowing them to be used as standard cars. Existing engine systems must be modified to enable better mileage. Improvements must be made in exhaust purification and hybrid systems, which will drive up R&D costs.

The worldwide cost increase of crude oil is having an adverse effect on auto sales and the procurement of raw materials. Resin as well, which requires petroleum to manufacture, are expected to become more expensive in the future and further drive up the cost of auto parts. The price increase of crude oil will give much impact on auto sales in the future.

For the Japanese auto industry, which has been able to boost production as a result of improvements in the Japanese economy, the rising cost of oil poses a serious problem and could cause auto sales to drop. This challenge, combined with environmental challenges, has created the necessity for Japanese automakers to

begin to take on more diverse roles. As we have seen in the case of Toyota, now more than ever is the time for Japanese automakers to fulfill social responsibilities and take on more roles in the global auto industry. This situation says a lot about the international recognition of Japanese automakers as global market leaders.

develop more environment-friendly, fuel-efficient cars. Meeting this challenge will help them to strengthen their competitive edge.

As more and more Japanese cars are manufactured overseas each, the importance of overseas manufacturing plants grows. The output of these plants will certainly increase in the future, and consumers overseas now demand the same cost and level of quality of Japanese cars manufactured overseas as those produced in Japan. Consequently, Japanese automakers are now expected to show greater commitments to the overseas communities they now operate in. In fact, Japanese automakers have in recent years begun to introduce new car models in Japan and abroad almost simultaneously; in the past, new car models were first unveiled in Japan and then introduced into international markets only after all issues discovered in the Japanese market had been resolved. Now, when a new model is unveiled simultaneously worldwide, any problems that are subsequently discovered must be dealt with by the Japanese parent company's respective local subsidiaries or submitted to the parent company for troubleshooting. As a result, overseas plants must possess the ability to solve problems on their own, which, in itself, is also a priority for Japanese automakers – training their overseas human resources. Doing so requires a strong commitment to these overseas communities and a transfer of technology.

Japanese automakers have always operated with the fundamental philosophy of "introduce

products in demand by global customers in a timely manner,” and simultaneous market introduction is one way of fulfilling this goal. In order to make this possible, not only the Japanese automakers but their parts suppliers and overseas employees as well must improve their respective abilities. This is another reason why

they must step up efforts to further raise the levels of their overseas plants and boost the capacity of their manufacturing partners. This will greatly enable Japanese automakers to maintain a strong position in the global market as “global players.”

4-2 Auto Parts

4-2-1 Supply and demand trends

(1) Overview

As Japanese automakers have steadily increased their output, so, too, have Japanese auto parts manufacturers. They have also seen their sales and profits rise – a trend that many of them expect to continue in 2005. Still, the soaring cost of crude oil has driven up the cost of raw materials; this and other factors threaten to reverse this upward trend. To survive in this severe market environment, many auto parts manufacturers are trying to reduce costs, promote globalization efforts, and develop products that meet higher environmental and safety standards. From this perspective, severe conditions in the industry have not changed.

(2) Production trends

As Diagram 4-2-1 shows, auto parts production continued to increase in 2004, which seems to indicate that the upward trend of recent years will continue in the future. Compared to 2003 figures, statistics from 2004 indicate across-the-board growth. Out of 43 auto parts categories, the highest growth was noticed in the cylinder liner, bushing, and bearing metal categories; however, sharp declines were evident in the oil filter, window regulator, and heating system categories.

As mentioned in the previous section, domestic auto production continues to enjoy an upward trend; in particular, the introduction of

Global conditions have also contributed to growth in Japanese auto parts industry. Some examples are the low level of growth in the U.S. economy and falling car prices in the Chinese market. Auto parts manufacturers are being pressed to adopt a broad range of global strategies in order to support Japanese automakers and their aggressive efforts to boost overseas production. Thus, the Japanese auto parts industry under such severe global competition is supporting the Japanese auto industry, by implementing various measures.

new car models helped to boost production of large and midget passenger cars. Additionally, sales of large scooters in the motor cycle category have continued to rise as well. These factors are thought to have contributed to an increase in production of auto parts. Furthermore, the auto parts industry is expected to enjoy favorable conditions in the future due to the unveiling of new and updated small passenger car models and to further passenger car production increases. However, increased production of truck and bus parts is not expected in the future because fewer environment-friendly trucks and buses are being introduced into the market.

Diagram 4-2-1 Auto parts production statistics

(Unit: million yen)

	2000	2001	2002	2003	2004
Overall	6,055,973	5,870,395	6,466,030	6,708,419	7,016,323
Auto parts	4,567,296	4,517,472	5,097,922	5,291,938	5,553,407
Related auto parts	1,012,295	899,499	889,252	941,074	953,265
Electric internal-combustion equipment	363,500	346,749	376,245	377,503	397,539
Motorcycle parts	112,882	106,675	102,611	97,904	112,112

Source: "Auto Parts Monthly" magazine, Japan Auto Parts Industries Association (JAPIA)

Diagram 4-2-2 shows a breakdown of auto parts shipments from 1999 to 2003. These statistics show that the ratio of shipments of parts for use in assemblies has been in decline since 2001; these parts accounted for 73.7% of all parts shipped in 2003. The ratio of shipments of

parts for use by other parts manufacturers, however, has been on the rise since 1999; these parts accounted for 16.8% of all parts shipped in 2003. Based on these results, it may be concluded that the production of modular parts continues to rise.

Diagram 4-2-2 Breakdown of auto parts shipments

(Unit: %)

	1999	2000	2001	2002	2003
Assembly	76.1	76.5	75.5	74.6	73.7
Maintenance	10.5	9.8	10.3	10.0	9.4
Other parts manufacturers	13.4	13.6	14.1	15.3	16.8

Source: "Auto Parts Shipment Trend Survey," 1999–2003, Japan Auto Parts Industries Association (JAPIA)

(3) Export and import trends

As Diagram 4-2-3 shows, exports of auto parts continue to enjoy an upward trend. Shipments to overseas regions in which Japanese auto parts manufacturers operate – North America, Asia, and Europe – accounted for the highest monetary values. Furthermore, the value of shipments to the developing markets of South America and Africa increased as well due to growth in those regions' auto industries. These results seem to suggest that, although the volume of shipments to the well-established mar-

kets of North America and Europe, in addition to the emerging markets of Asia, South America, and Africa, may be expected to continue to rise in the future, drastic increases in import revenues cannot be expected due to increased local production overseas. As emerging overseas auto markets continue to grow and Japanese auto parts makers expand manufacturing operations into these markets, the rate at which revenues from exports to these regions grow is expected to steadily level out.

Diagram 4-2-3 Revenues from exports of Japanese auto parts by region

(Unit: million yen)

Region	2000	2001	2002	2003	2004
Asia	928,893	948,627	1,124,631	1,352,922	1,793,441
Middle East	109,910	127,526	152,030	152,611	190,208
Europe	759,768	748,294	823,450	857,151	1,075,234
North America	1,753,876	1,722,489	1,863,050	1,816,492	2,241,257
Central America	114,703	107,483	100,345	88,383	115,052
South America	88,028	102,639	96,667	94,786	145,789
Africa	101,990	93,508	94,036	108,212	157,489
Oceania	108,012	110,267	112,098	113,403	123,066
Total	3,965,180	3,960,833	4,366,307	4,583,960	5,841,536

Source: Statistics data on the website (www.japia.or.jp), Japan Auto Parts Industries Association (JAPIA)

The monetary value of auto parts imports, too, has been on the rise in recent years. Industry watchers believe this trend indicates that more and more Japanese auto parts manufacturers are

implementing "global optimum procurement" practices to reduce costs. An examination of the breakdown of import values by region shows that imports from Asia account for roughly 55%

of the total value of imports. If the values of imports from Asia, North America, and Europe are added together, the sum accounts for 97% of the total value of imports. In the future, the monetary value of auto parts imports from North America, Europe, and Asia in particular is ex-

pected to account for an even larger portion of the total value of imports. Industry watchers also believe that growth in overseas auto parts manufacturing industries will further drive auto parts imports in Japan.

Diagram 4-2-4 Revenues from imports of auto parts by region

(Unit: million yen)

Region	2000	2001	2002	2003	2004
Asia	280,938	346,895	413,374	456,755	595,837
Middle East	198	225	97	196	183
Europe	110,383	126,432	159,029	215,789	297,270
North America	198,710	208,776	264,748	213,812	153,074
Central America	2,648	4,205	8,141	14,341	18,236
South America	1,454	1,293	1,838	1,509	1,858
Africa	1,079	1,989	2,336	2,006	2,256
Oceania	13,582	9,955	10,935	8,144	6,894
Total	608,992	699,770	860,498	912,552	1,075,608

Source: Statistics data on the website (www.japia.or.jp), Japan Auto Parts Industries Association (JAPIA)

4-2-2 Overview of overseas operations

In November 2004, JAPIA published the results of its survey on the overseas operations of Japanese auto parts makers. According to the results, Japanese auto parts makers have established 1,323 companies abroad – a number that has increased year by year for the past three years as auto parts makers take more aggressive steps to boost overseas production. On a single-year basis, including cumulative results, more

and more of these overseas operations are becoming profitable, which indicates stable growth.

This trend is evident in Asia as well, where business performance is improving. Asia continues to be a vital region for Japanese auto parts manufacturing operations. It should be pointed out that, according to Diagram 4-2-5, the ratio of exports of auto parts manufactured by Japanese plants in Asia, which has enjoyed an upward trend in the past, has begun to decline.

Diagram 4-2-5 Export ratio of auto parts manufactured by Japanese plants in Asia
(Weighted average percentage based on sales revenues)

	Asia Total			ASEAN			China		
	2001	2002	2003	2001	2002	2003	2001	2002	2003
Export ratio	36.6	37.9	32.3	39.3	44.0	40.4	59.9	56.1	36.1
To Japan	12.7	17.7	13.7	11.9	16.2	14.6	25.8	45.9	24.7
To other nations	23.9	20.1	18.7	27.4	27.8	25.8	34.1	10.1	11.4

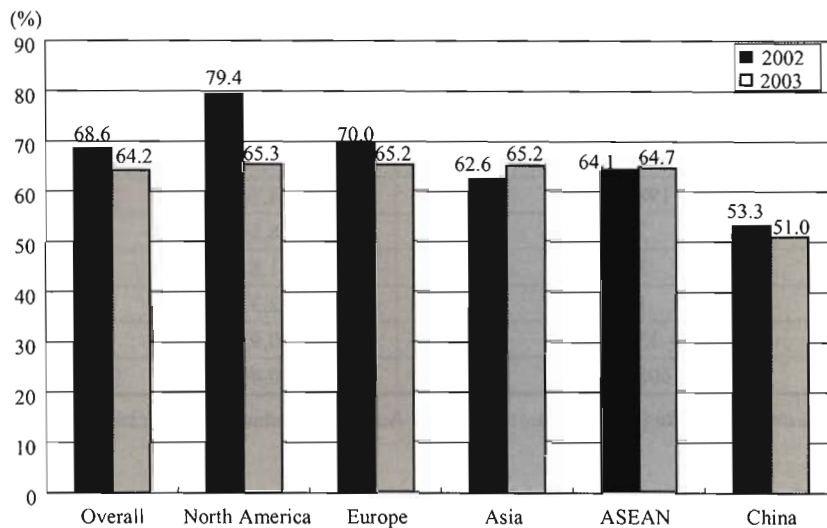
Source: "Overseas Operations Survey Report," Japan Auto Parts Industries Association (JAPIA), November 2004 (p. 2)

Demand has continued to grow in the ASEAN and Chinese auto markets over the past several years. Consequently, sales of auto parts

manufactured by Japanese-owned plants in these regions are gradually shifting away from exports and toward domestic markets. Shipments of auto

parts manufactured by Japanese-owned plants to the domestic markets in which they were produced continues to account for roughly half of total shipments. However, as overseas production continues to increase, Japanese auto parts makers have expressed their desire to procure a larger portion of parts from overseas, and are

also being encouraged by others to do so. Nevertheless, Diagram 4-2-6 shows that the ratio of parts procured by Japanese automakers from overseas did not increase dramatically between 2002 and 2003; instead, with the exception of Asia (including ASEAN), the ratio of parts procured from all other regions actually dropped.



Notes:

1) Overseas procurement ratio = (sales – import procurement cost) / sales

2) Imports within EU, NAFTA, and ASEAN are not considered “imports.”

3) Number of companies included in the 2002 survey:

- Total = 425 - North America = 134 - Europe = 55 - Asia = 203 - ASEAN = 106 - China = 58

4) Number of companies included in the 2003 survey:

- Total = 482 - North America = 134 - Europe = 60 - Asia = 249 - ASEAN = 128 - China = 76

Source: “Overseas Operations Survey Report,” Japan Auto Parts Industries Association (JAPIA), November 2004 (p. 17)

Diagram 4-2-6 Ratio of auto parts procured overseas by Japanese auto parts makers

Statistics concerning the expansion of auto parts manufacturing operations into overseas locations, which is being driven by the aggressive efforts of automakers to expand their own operations into emerging markets, indicate a trend that has not been observed in the past. For example, the eight new plants that were built in Europe in 2003 were all built in former Eastern-bloc countries, and 44 new plants were built in China – which ranked above all other regions. Aggressive measures to expand operations into these emerging markets are expected to accelerate in the future. Japanese automakers are already working to expand production and build

new plants in the emerging markets of South America, South Africa, Russia, China, and India, and Japanese auto parts makers are doing the same in order to accommodate automakers’ needs. As Japanese automobile production continues to expand on a global scale, auto parts makers will need to take more aggressive steps to boost their own production capacity overseas.

As the Chinese auto industry continues to grow and Japan enters into free trade agreements with other nations, Japanese automakers operating in ASEAN nations are working diligently to boost production to accommodate the increased needs that these developments bring about. The

ASEAN auto market, which fell into a slump after the currency crisis of 1997, has gradually recovered; in fact, in the past few years, the number of automobiles produced has exceeded post-1997 peak levels.

Efforts by Japanese auto parts makers to boost production in overseas regions have, in turn, enabled Japanese automakers in the same regions to boost their own production. Additionally, these efforts are being focused on Thailand, which has the most integrated auto industry in the ASEAN nations. As observed in the mission of Toyota's IMV project, ASEAN production bases are becoming an increasingly important part of Japanese automakers' global strategies. Consequently, overseas auto parts plants are

working aggressively to supply these automakers with parts that are equal in quality, cost, and availability to those manufactured in Japan. In particular, Japanese-owned auto parts makers in Thailand are now supplying a broader range of parts to the global market, and are implementing efficient production systems that were developed in Japan. This may be attributed to aggressive measures taken by Japanese parent companies to educate and train their human resources abroad, and to the favorable performance of Japanese production systems. In addition to the ASEAN region, these same trends are expected to develop in other regions around the world where Japanese-owned auto parts plants are located.

4-2-3 Future prospects and challenges

Some of the challenges that face the Japanese auto parts industry today are 1) establishing a global production network to meet the needs of expanded automobile production, 2) developing products and production technology that lessen the burden on the natural environment, 3) implementing modular technology, and 4) implementing "intelligent" car technology.

The ability to supply parts for use in environment-friendly products is vital to the Japanese auto industry. Environmental problems pose challenges to the entire world, and Japanese automakers are working to develop more hybrid cars in an effort to secure their positions in the global market. Furthermore, "intelligent" car technology, which requires more highly-advanced electronic components, is becoming more common. This means that Japanese automakers will need to develop new partnerships in order to develop next-generation technology, which, in turn, means that Japanese auto parts makers will have to cope with increased competition.

One of the greatest challenges in recent years is the soaring cost of crude oil, which has

driven up the cost of raw materials and made it increasingly difficult for auto parts makers to remain profitable despite having implemented numerous cost-saving measures in cooperation with automakers. Still, automakers are expected to continue to pursue further cost reduction activities, and to require the same of their parts suppliers. To meet automakers' demands, auto parts makers will have to 1) find ways to procure raw materials at cheaper prices, 2) implement new cost-saving development techniques and production systems, 3) and substitute certain parts and assemblies with others.

Rising crude oil costs will also force automakers to manufacture more fuel-efficient cars as consumers faced with higher gasoline prices start to demand more efficient alternatives. An urgent need for the development of more fuel-efficient engines and reduction of car body weight exists.

Japanese auto parts makers' constant efforts to overcome these challenges have without a doubt help them to strengthen their competitive ability. Industry watchers expect this trend to continue in the future.

4-3 Aircraft

4-3-1 Supply and demand trends

(1) Overview

The September 11th terrorist attacks on the United States, the war in Iraq, the outbreak of SARS, and other developments have created many future uncertainties for the global community. These events have had an adverse effect on Japanese and international air travel business. Recently, however, the air travel industry has started to rebound due in large part to remarkable economic growth in Asia.

Significant growth in the discount air travel sector is driving Southeast Asian and Indian airline companies¹ to purchase more aircraft. Over the next 20 years, starting in FY 2004, roughly 25,000 new commercial aircraft are expected to be sold in the global market².

(2) Production trends

Diagram 4-3-1 shows aircraft industry production statistics³ (sales revenues) for the years 1982 through 2004. The data shows that in 2004, sales revenues experienced an increase for the first time since 2000, and rose 6.6% over the previous year to a total of ¥971.5 billion. An

In the civil aircraft sector, Airbus S.A.S. is now selling new A380 super-jumbo passenger jets, and has begun developing its mid-size A350 passenger jet. In 2008, Boeing plans to put into service a new mid-size, next-generation passenger jet that features a carbon-fiber composite airframe. This jet was developed through a partnership with Mitsubishi Heavy Industries, Ltd., Kawasaki Heavy Industries, Ltd., and Fuji Heavy Industries Inc., which handled roughly 35% of the R&D burden; this collaboration is expected to stimulate industrial growth in Japan.

examination of the breakdown by product shows that compared to 2003 figures sales of airframes in 2004 increased 12.3% to ¥599.0 billion, sales of engines increased 1.5% to ¥251.2 billion, and sales of other aircraft-related equipments fell 11.2% to ¥121.2 billion.

(3) Export and import trends

In 2004, the export value of aircraft engine, airframe, and parts fell 14.3% over the previous year to ¥229.7 billion, and the import value fell 16.3% to ¥753.9 billion (see Diagram 4-3-2). The “three principles of arms export” were re-

laxed at the end of 2004, which removed some restrictions on international sales and made it possible for Japanese companies to sell military-use aircraft for commercial use abroad.

¹ Indian airline companies are predicted to place new orders for more than 200 planes in 2005.

² Based on Boeing's “2005 Current Market Outlook,” which predicts demand for 25,700 new commercial aircraft between 2005 and 2024.

³ Data compiled by the Society of Japanese Aerospace Companies using “Machinery Statistics” provided by the Ministry of Economy, Trade and Industry. Data includes both production revenues and repair revenues.

(4) 2005 outlook

According to a survey of the 28 member companies of the Society of Japanese Aerospace Companies (see Diagram 4-3-3), the production value of aircraft to be manufactured in 2005 is expected to increase by ¥42.6 billion over the previous year to ¥997.8 billion.

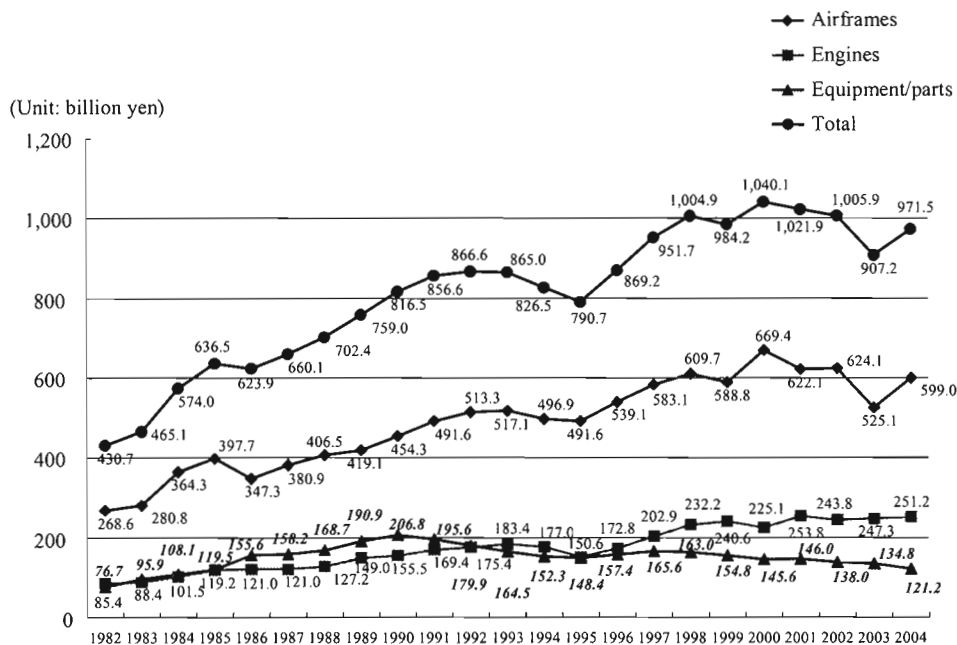
Airframe-related production was adversely affected by a reduction in the number of F-2 airframes; still, combined with parts production, the total value is expected to increase by ¥25.7 billion to ¥ 588.8 billion.

In the aircraft engine sector, increased demand for engine parts is expected to increase the value of production by ¥17.2 billion over 2004 figures to ¥ 267.6 billion. The production value of accessories is expected to drop by ¥0.3 billion to ¥141.4 billion.

The value of exports in 2005 is predicted to increase by ¥66.5 billion to ¥343.2 billion. Airframe-related exports are expected to increase

by ¥38.9 billion to ¥167.7 billion, and engine exports are expected to increase by ¥28.4 billion to ¥159.1 billion. Accessory exports are expected to drop by ¥0.8 billion to ¥16.4 billion.

The upward trends in so many sectors are considered to be the result of recovering demand for commercial aircraft. The total monetary value of aircraft orders placed in 2004 is expected to increase by ¥34.5 billion to ¥961.3 billion. For airframe-related orders alone, the value is expected to increase by ¥18.4 billion to ¥556.7 billion; for engine orders alone, the value is expected to increase by ¥10.7 billion to ¥260.6 billion; for accessory orders alone, the value is expected to increase by ¥5.4 billion to ¥144.0 billion.



Source: Data by The Society of Japanese Aerospace Companies

Diagram 4-3-1 Aircraft industry production statistics (sales revenues)

Diagram 4-3-2 Value of aircraft-related imports & exports

(Unit: million yen)

	Exports	Imports
Aircraft engines (pistons)	71	244
Aircraft engines (pistons) parts	2,146	2,152
Aircraft engines (turbines, etc.)	1,406	138,002
Aircraft engines (turbines, etc.) parts	99,623	178,482
Gliders, hang gliders, hot air balloons, blimps, and engineless aircraft	370	197
Helicopters (total)	421	8,374
2,000 kg and under	421	4,892
Over 2,000 kg	-	3,482
Airplanes and other aircraft (total)	252	298,608
2,000 kg and under	52	376
2,001 kg to 15,000 kg	200	1,943
Over 15,000 kg	-	296,289
Parts (total)	125,416	124,710
Propellers	-	713
Helicopter blades	646	2,030
Propellers, blades, and their components (excluding helicopter blades)	41	1,604
Other airplane and helicopter components	120,648	97,486
Hot air balloon, blimp, and glider components	-	-
Landing gear and associated components	2,941	18,206
Other	1,140	4,671
Parachutes, rotochutes, and their components	12	1,078
Aircraft launching gear, deck-arrestor gear, and other similar devices and their components	2	175
Ground flying trainers and other components	5	1,887
Total	229,724	753,909

Source: Data by The Society of Japanese Aerospace Companies

Diagram 4-3-3 FY 2005 aircraft production & export forecasts

		Production value (¥billion)					Export value (¥billion)		
		2003 actual	2004 forecast	2005 forecast			2003 actual	2004 forecast	2005 forecast
Airframe-related	Airframes	208.4	225.6	202.3	Airframe-related	Airframes	0.1	0.6	0
	Parts	297.9	337.5	386.5		Parts	161.8	128.2	167.7
	Subtotal	506.3	563.1	588.8		Subtotal	161.9	128.8	167.7
Engine-related	Engines	69.5	65.0	65.5	Engine-related	Engines	14.4	13.0	18.5
	Parts	171.4	185.5	202.1		Parts	108.7	117.7	140.6
	Subtotal	240.9	250.5	267.6		Subtotal	123.1	130.7	159.1
Accessories		145.4	141.7	141.4	Accessories		17.6	17.2	16.4
Total		892.6	955.3	997.8	Total		302.6	276.7	343.2

Source: "Aircraft Production/Export/Order Forecast," The Society of Japanese Aerospace Companies

Diagram 4-3-4 Financial performance of top five Japanese aircraft companies (consolidated)

(Unit: billion yen, %)

		March 2000	March 2001	March 2002	March 2003	March 2004	y/y
Mitsubishi Heavy Industries	Sales	3,045.0	2,863.9	2,593.8	2,373.4	2,590.7	9.2%
	Aerospace division	522.2	472.0	506.7	392.2	407.9	4.0%
	Operating profits	74.8	78.6	115.3	66.6	14.7	-77.9%
	Ordinary profits	63.2	67.9	78.1	29.7	12.5	-57.9%
	Operating profit margin	2.5%	2.7%	4.4%	2.8%	0.6%	-
Kawasaki Heavy Industries	Sales	1,060.4	1,144.5	1,239.5	1,160.2	1,241.5	7.0%
	Aerospace division	136.1	161.0	154.8	173.7	188.2	8.3%
	Operating profits	4.4	31.3	30.5	22.2	24.7	11.3%
	Ordinary profits	-3.5	14.2	16.2	12.1	21.0	73.6%
	Operating profit margin	0.4%	2.7%	2.5%	1.9%	2.0%	-
Ishikawajima- Harima Heavy Industries	Sales	1,114.8	1,082.4	1,019.0	1,047.4	1,089.0	4.0%
	Aerospace division	233.9	232.9	243.8	241.4	238.3	-1.3%
	Operating profits	39.9	27.2	24.6	-23.2	10.6	-
	Ordinary profits	28.0	18.7	9.6	-42.4	4.2	-
	Operating profit margin	3.6%	2.5%	2.4%	-2.2%	1.0%	-
Fuji Heavy Industries	Sales	1,311.8	1,362.4	1,372.3	1,439.4	1,446.4	0.5%
	Aerospace division	65.6	66.3	63.0	56.6	59.5	5.1%
	Operating profits	81.6	88.4	67.5	50.3	42.0	-16.5%
	Ordinary profits	71.5	78.2	58.5	56.6	43.5	-23.1%
	Operating profit margin	6.2%	6.5%	4.9%	3.5%	2.9%	-
ShinMaywa Industries	Sales	134.3	142.2	139.5	130.6	127.9	-2.1%
	Aerospace division	25.0	33.9	38.5	28.8	20.8	-27.8%
	Operating profits	3.2	2.8	3.2	6.4	6.0	-6.3%
	Ordinary profits	2.3	1.8	2.4	5.9	6.1	3.4%
	Operating profit margin	2.4%	2.0%	2.3%	4.9%	4.7%	-

Data: Statements of accounts published by featured companies, March 2005

4-3-2 Business conditions & industry trends

(1) Business conditions

As Boeing gets ready to start manufacturing the new 787 jet, Mitsubishi Heavy Industries, Kawasaki Heavy Industries, and Fuji Heavy Industries are building new plants to manufacture airframes for Boeing, and aircraft engine manufacturers Ishikawajima-Harima Heavy Industries and Kawasaki Heavy Industries are working to upgrade their production and testing facilities.

Mitsubishi Heavy Industries, which will manufacture airframes for Boeing, has seen mid-size and small aircraft-related orders increase; as a result, its aerospace-related sales revenues increased 4.0% over the previous year to ¥407.9 billion. The company intends to invest ¥80.0

billion in its joint development partnership with Boeing, and also plans to develop Japan's first commercial jet (70–90 passenger capacity) in the near future.

Kawasaki Heavy industries saw its sales revenues increase 8.3% over the previous year to ¥188.2 billion. This was due in part to an increase in private-sector demand (e.g. Boeing), an increase in military-sector demand for jumbo jet development, and the improved performance of its consolidated subsidiary, NIPPI Corporation. The relaxation of the “three principles of arms export” made it possible for the company to sell patrol and transport aircraft for commercial use

abroad. Consequently, the company is expected to increase exports in the future.

Aircraft engine manufacturer Ishikawajima-Harima Heavy Industries has fallen on hard times due to military cutbacks. Its sales revenues fell slightly below previous-year figures to ¥238.3 billion, while its sales profits rose 39.3% to ¥13.0 billion. New partnerships with Boeing and Airbus for the next project of mid-size aircraft engine are expected to drive sales further in coming years.

Fuji Heavy Industries delivered fewer military aircraft, but still saw sales of its patrol and transport aircraft increase over the previous year.

(2) Future prospects and challenges

It is said that automobiles are comprised of roughly 30,000 parts, and that aircraft are comprised of roughly 300,000 parts. The aircraft industry is one in which the ripple effect of technology has a considerable effect; it is a tightly-knit, broad-based industry that relies on advanced technologies⁴ from other fields.

Manufacturers in the Japanese aircraft industry have asserted their presence by becoming involved in joint international projects to develop new supersonic passenger jets⁵, midsize passenger jets, and aircraft engines. They have also started to sell regional jets and former military aircraft for commercial use abroad. Consequently, industry watchers expect to see that Japanese small and medium manufacturers will enter the aircraft and their parts industry in the future.

In October 2004, the Okayama Prefecture Industrial Promotion Foundation and parts manufacturers within the prefecture joined to-

Sales of vertical tail parts for use in Airbus A380 jets in particular helped sales to increase 4.6% to ¥59.5 billion.

ShinMaywa Industries saw private-sector sales increase due to higher demand for parts (as a result of increased production at Boeing) and rotor blades of small business jets. The company's aerospace division increased its sales 27.6% over the previous year to ¥20.8 billion. The relaxation of the "three principles of arms export" made it possible for the company to start selling rescue flying-boats developed for Japan's Self-Defense Forces overseas for use in fighting fires in the future.

together to establish "WingWin Okayama," a consortium designed to win aircraft parts orders for highly specialized small and medium enterprises. A similar organization called the "Next-generation Aircraft Parts Supply Network" was established in Osaka; this group is comprised of small and medium enterprises that specialize in processing and cutting technology. Both of these organizations also help specialized small and medium enterprises expand into new fields by resolving any issues that might prevent them from doing so.

Needless to say, the Japanese aircraft industry will need to boost its R&D capacity and technological prowess in order to become a leading industry. Furthermore, comprehensive efforts in the private sector (e.g. improvement of social environment and consolidation of a legal system) will be required to increase air traffic, which in turn should drive growth in the aircraft industry.

⁴ Those relating to design and production of airframes, engines, parts, etc. of aircraft includes technologies related to composite materials, heat-resistant alloys, lightweight and compact auxiliary devices, high-precision processing, high-precision image reception, numerical fluid dynamics, plate metals and molds, digital control devices, hydraulic systems, landing systems, coatings, environmental burden reduction, and fuel cells.

⁵ In June 2005, the Society of Japanese Aerospace Companies and the French Aerospace Industries Association (GIFAS) entered into a three-year partnership to develop engine noise-reduction technology and technology that will make it possible to use composite materials in the structure of supersonic aircraft.