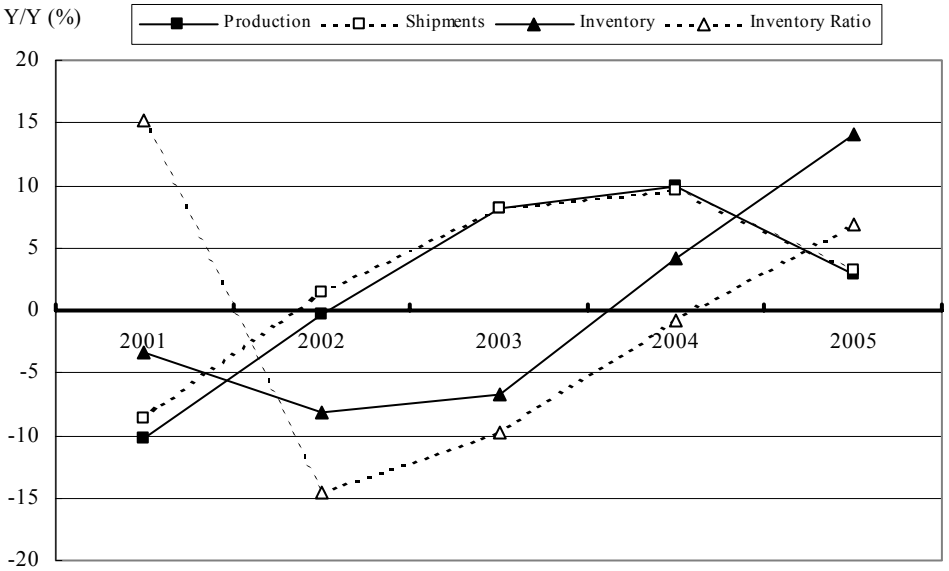
Chapter 1　Japanese Machine Industry Trends

1-1. Trends in Machine Industry Production & Shipments

(1) Trends Over the Past Five Years

Machine industry production (excluding steel ship and rail car manufacturing sectors) in 2005 rose 2.9% over the previous year. This trend can be attributed to production increases across all machine industry sectors: general machinery, transportation machinery, electrical machinery, electronics parts/devices, and precision instruments. Production of information and telecommunications equipment, on the other hand, did not improve over the previous year. Overall industry shipments, too, rose by 3.2% over the previous year.

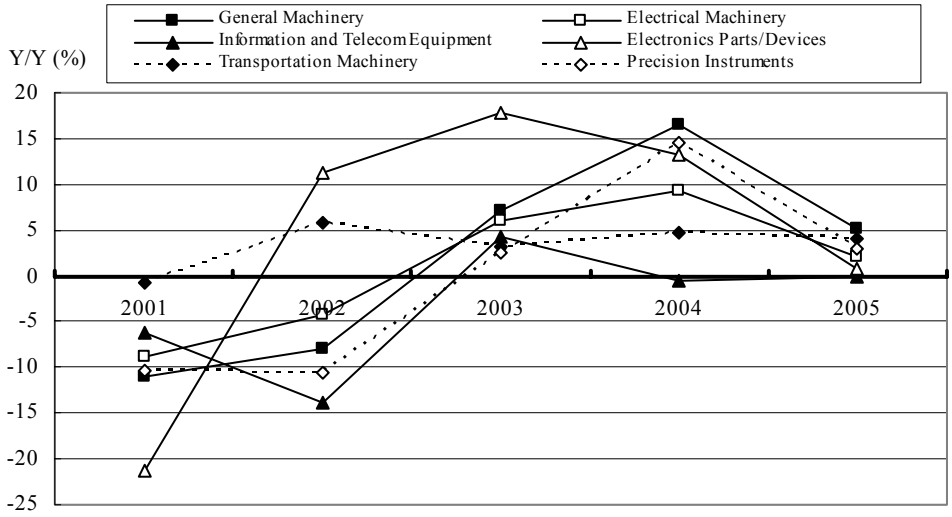
Diagram 1-1 shows production indexes, shipment indexes, inventory indexes, and inventory ratios for the years 2001 through 2005; these figures do not take steel ship and rail car production/shipments/inventory into account. The chart indicates that production started to recover in the years following 2001, and that the production index in 2004 rose to +10 – a significantly high level. However, the 2005 production index rose only to +2.9. The shipment index followed almost the same trend as production, rising only to +3.2 in 2005. The inventory index, on the other hand, switched from a negative to a positive number in 2004, and rose to +14.1 in 2005. The inventory ratio, too rose year-on-year since 2002 and recorded +6.9 in 2005.



Source: “Annual Report on Machinery Statistics” (METI)

Diagram 1-1. Machine Industry Index Trends (Year-on-year)

Diagram 1-2 shows machine industry production index trends by industry sector. The chart indicates that indexes in all areas of the machine industry in 2005 decreased from the previous year. Specifically, an index of +5.2 was calculated for general machinery, +2.0 for electromechanical equipment, and +3.0 for precision instruments. Furthermore, an index of +4.1 was calculated for transportation machinery. These figures indicate that indexes in these areas have stabilized. The electronic parts/device production index fell to +0.8. The information and telecommunications equipment index, unlike other key sectors, fell to -0.2 for the second year in a row.



Source: "Annual Report on Machinery Statistics" (METI)

Diagram 1-2. Sector-specific Production Index Trends (Year-on-year)

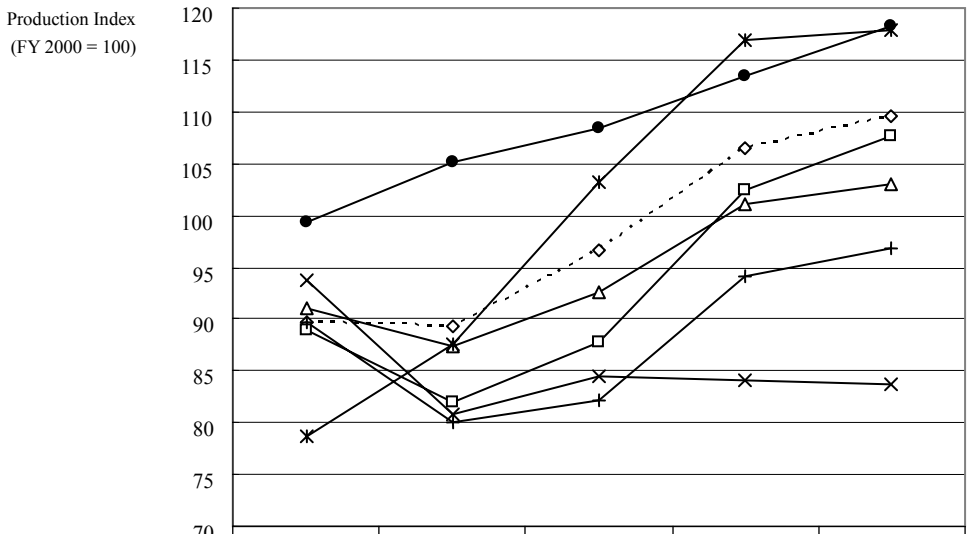
Diagrams 1-3 and 1-4 show overall and industry-specific production and shipment index trends (excluding the steel ship and rail car manufacturing sectors). Indexes for 2000 have been set to 100.

As Diagram 1-3 indicates, the overall machine industry production index reached 106.4 in 2004, showing the first sign in four years of an upward trend; the index increased again the following year to 109.5.

A closer look at individual sectors reveals that the transportation machinery production index reached 118.2 in 2005, continuing a two-year upward trend. The electronic parts/devices sector, too, has maintained a high index over the past two years; its 2005 index reached 117.8. The general machinery sector saw its production index rise sharply over the past two years to a respectable 107.7, and the electrical machinery sector saw its own index rise to an acceptable 103.0. On the other hand, the production index in the information and telecommunications equipment sector fell to 83.8 from the previous year. Although the precision instruments sector showed signs of recovery in previous years, its production index only reached 96.9 in 2005.

Next, let us take a look at shipment indexes from 2001 to 2005, with indexes for 2000 set at 100 points. As shown in Diagram 1-4, the overall machine industry index reached 113.3 in 2005, indicating a two-year recovery trend. The shipment index for the electronics parts/devices sector reached a high 129.5, surpassing the 124.6-point mark it reached in 2004. The transportation machinery sector also saw its shipment index rise for the second year in a row to 116.4 (113.0 in 2004). The general machinery and electrical machinery sectors also continued to experience upward trends with shipment indexes of 111.2 and 108.2, respectively.

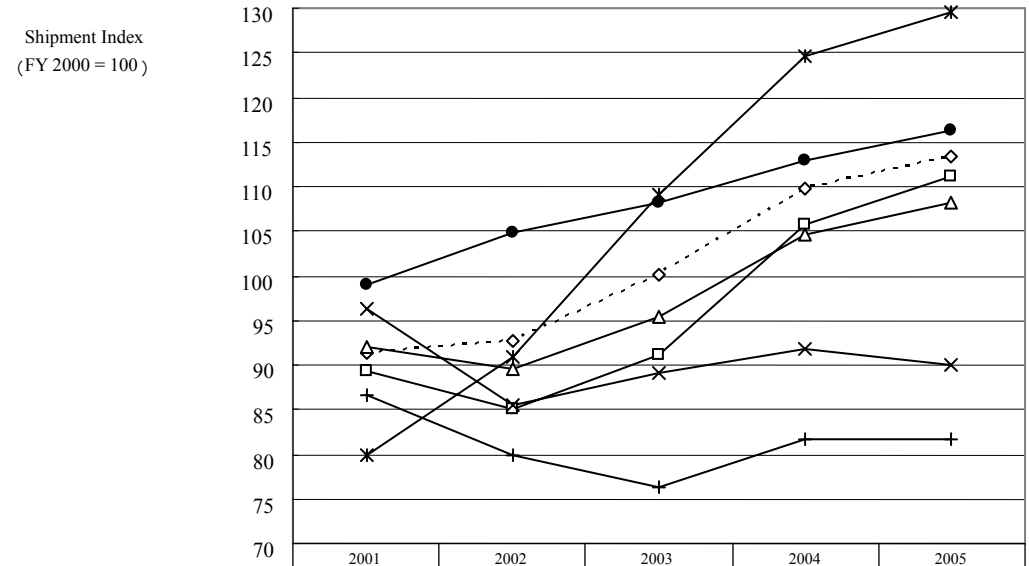
On the other hand, the 2005 shipment index for the information and telecommunications equipment sector fell 1.8 points from the previous year to 90.1. The 2005 index for the precision instruments sector rose only slightly over the previous year to 81.7, continuing to indicate poor performance.



	2001	2002	2003	2004	2005
Overall Machine Industry (excluding steel ship and rail car manufacturing sectors)	89.7	89.4	96.7	106.4	109.5
General Machinery	89	81.9	87.8	102.4	107.7
Electrical Machinery	91.1	87.3	92.5	101	103
Information/Telecom Equipment	93.8	80.9	84.4	84	83.8
Electronics Parts/Devices	78.7	87.6	103.2	116.9	117.8
Transportation Machinery (excluding steel ship and rail car manufacturing sectors)	99.3	105.2	108.5	113.5	118.2
Precision Instruments	89.6	80.1	82.1	94.1	96.9

Source: "Annual Report on Machinery Statistics" (METI)

Diagram 1-3. Machine Industry Production Index Trends (FY 2000 = 100)



	2001	2002	2003	2004	2005
Overall Machine Industry (excluding steel ship and rail car manufacturing sectors)	91.3	92.7	100.2	109.8	113.3
General Machinery	89.3	85	91.2	105.8	111.2
Electrical Machinery	92.1	89.6	95.4	104.6	108.2
Information/Telecom Equipment	96.4	85.6	89.1	91.9	90.1
Electronics Parts/Devices	80	90.8	109.1	124.6	129.5
Transportation Machinery (excluding steel ship and rail car manufacturing sectors)	99	104.9	108.3	113	116.4
Precision Instruments	86.7	80	76.3	81.6	81.7

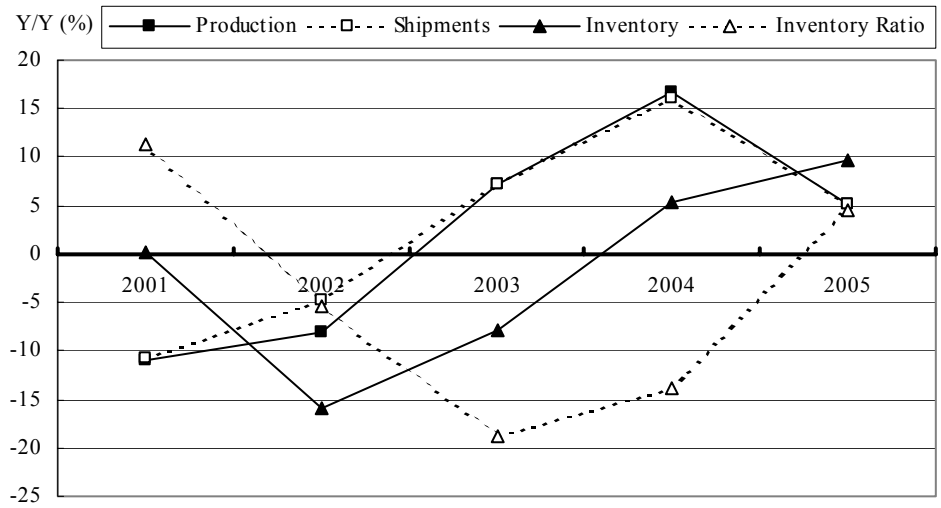
Source: "Annual Report on Machinery Statistics" (METI)

Diagram 1-4. Machine Industry Shipment Index Trends (FY 2000 = 100)

(2) General Machinery Sector Trends

The general machinery sector includes these fields: engineering and construction machinery, special industrial machinery, conveyance machinery, industrial robotics, agricultural machinery, machine tools, metal working machinery, textile machinery, office machines, refrigerating machines and appliances, molds/dies, and other general machinery. Production in this sector in 2005 rose 5.2% over the previous year, resulting in a consecutive three-year upward trend. While production of office machines and special industrial machinery declined, production of metal working machinery, engineering and construction machinery, and conveyance machinery increased; this is what has made the three-year upward trend possible.

Diagram 1-5 shows year-on-year trends in general machinery sector production/shipment/inventory indexes and inventory ratios. As the chart indicates, the production index has remained positive since 2003; while the index rose to +16.6 in 2004, it fell to +5.2 in 2005. Shipment indexes followed a similar trend. The inventory index in 2004 was +5.4; in 2005, it increased again to +9.7. The inventory ratio in 2004 was -13.8; in 2005, however, it rose to +4.6.

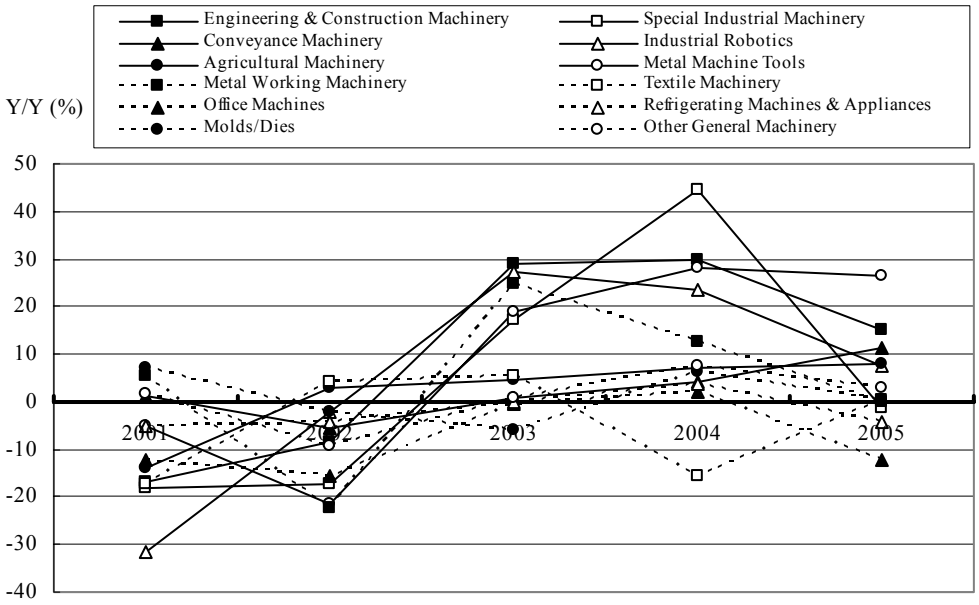


Source: "Annual Report on Machinery Statistics" (METI)

Diagram 1-5. General Machinery Sector Index Trends (Year-on-year)

Diagram 1-6 shows sub-sector-specific production indexes for the general machinery sector. As the chart indicates, the metal working machinery production index was a very high +26.3 points, the second-highest index after 2004. The 2005 index for engineering and construction machinery was +14.9 – not quite as high as the previous year's index, but still respectable. The 2005 index for conveyance machinery rose above the previous year's index to +11.1.

The office machines sub-sector, on the other hand, saw its production index fall sharply to -12.4. Additionally, the special industrial machinery sub-sector, which had a production index of +44.6 in 2004, saw its index plunge to -1.1 in 2005. The production index for refrigerating machines and appliances also fell to -4.3, indicating a downward trend. The agricultural machinery sub-sector has continued to show signs of recovery since 2002. The textile machinery index, which fell to -15.6 in 2004, indicated an upward trend in 2005.



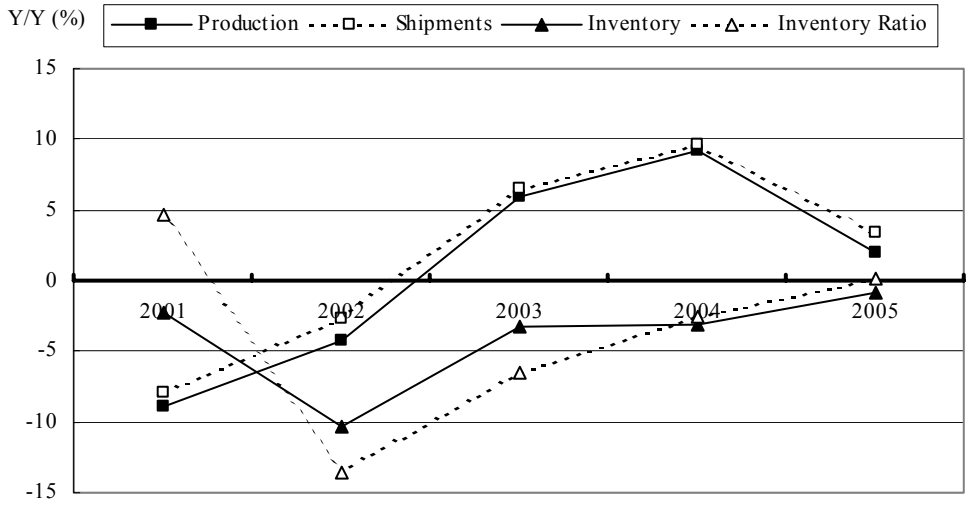
Source: "Annual Report on Machinery Statistics" (METI)

Diagram 1-6. General Machinery Sub-sector-specific Production Index Trends (Year-on-year)

(3) Electrical Machinery Sector Trends

The electrical machinery sector includes these fields: rotating electrical machinery, stationary electrical machinery, switching and controlling equipment, consumer electrical machinery, wiring/lighting equipment, associated electronic equipment, and electrical measuring instruments, and cells/batteries.

Diagram 1-7 shows year-on-year trends in electrical machinery sector production/shipment/inventory indexes and inventory ratios. As the chart indicates, both production and shipment indexes have been in an upward trend since 2002; in 2004, both indexes approached +10. In 2005, however, the production index fell to +2.0 and the shipment index fell to +3.4. Although the inventory index continued to remain negative, it rose to -0.8 in 2005 and promises to continue to increase in the future. The inventory ratio turned positive for the first time in four years, reaching +0.1.

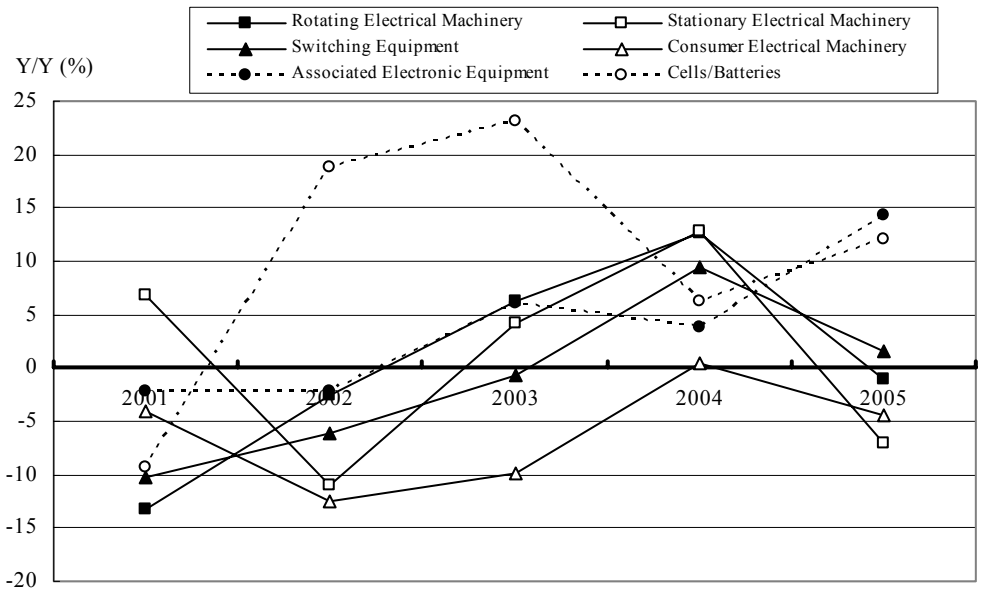


Source: "Annual Report on Machinery Statistics" (METI)

Diagram 1-7. Electrical Machinery Sector Index Trends (Year-on-year)

Diagram 1-8 shows sub-sector-specific production indexes for the electrical machinery sector (excluding wiring/lighting equipment). As the chart indicates, the production index of associated electronic equipment was a considerably high +14.3, indicating the potential for future growth. The 2005 production index for batteries was +12.0; this index has remained positive since 2002.

Stationary electrical machinery, consumer electrical machinery, and rotating electrical machinery all had minus indexes; the index for stationary electrical machinery fell particularly sharply from +12.8 in 2004 to -7.1 in 2005. Likewise, the index for rotating electrical machinery dropped from +12.6 in 2004 to -1.1 in 2005.



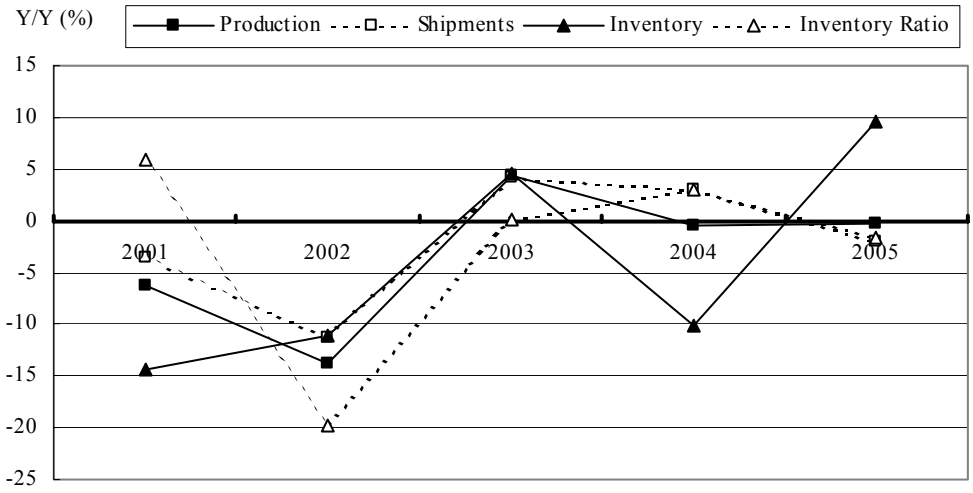
Source: "Annual Report on Machinery Statistics" (METI)

Diagram 1-8. Electrical Machinery Sub-sector-specific Production Index Trends (Year-on-year)

(4) Information & Telecommunication Equipment Sector Trends

The information and telecommunication equipment sector includes these fields: telecommunications equipment, consumer electronic machinery, and electronic computers.

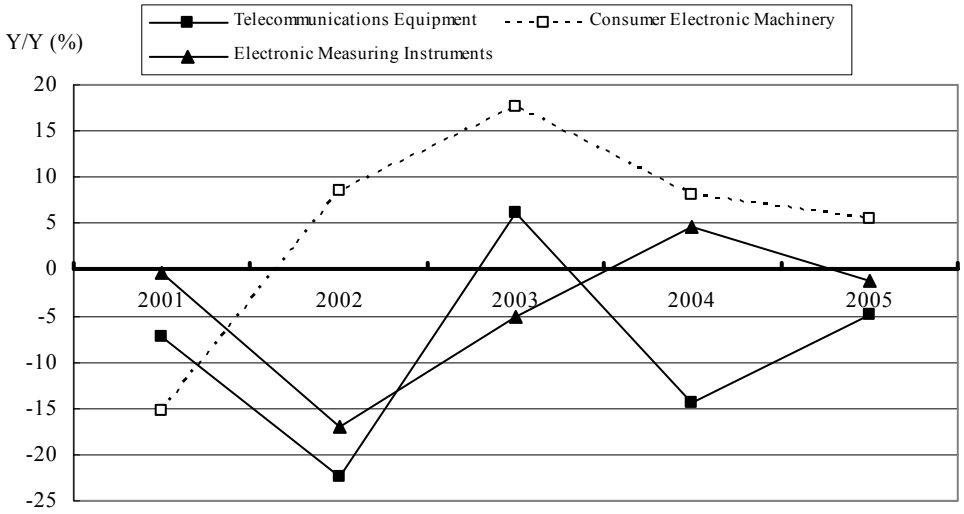
Diagram 1-9 shows year-on-year trends in information and telecommunication equipment sector production/shipment/inventory indexes and inventory ratios. As the chart indicates, the production index in this sector has been negative for the past two years (-0.2 in 2005). While the shipment index stayed positive in 2003 and '04, it dropped to -2.0 in 2005. Furthermore, the inventory index rose sharply from a minus figure in 2004 to +9.5 in 2005; similarly the inventory ratio fell from a plus figure in 2004 to -1.7 in 2005.



Source: "Annual Report on Machinery Statistics" (METI)

Diagram 1-9. Information & Telecommunications Equipment Sector Index Trends (Year-on-year)

Diagram 1-10 shows sub-sector-specific production indexes for the information and telecommunications equipment sector. As the chart indicates, the production index for telecommunications equipment in 2005 was -4.9, a vast improvement over the 2004 index, but still negative. Moreover, the production index for electronic computers in 2004 was +4.6; in 2005, the index dropped to -1.1. Consumer electronic machinery was the only sub-sector not to turn negative (+5.4 in 2005).

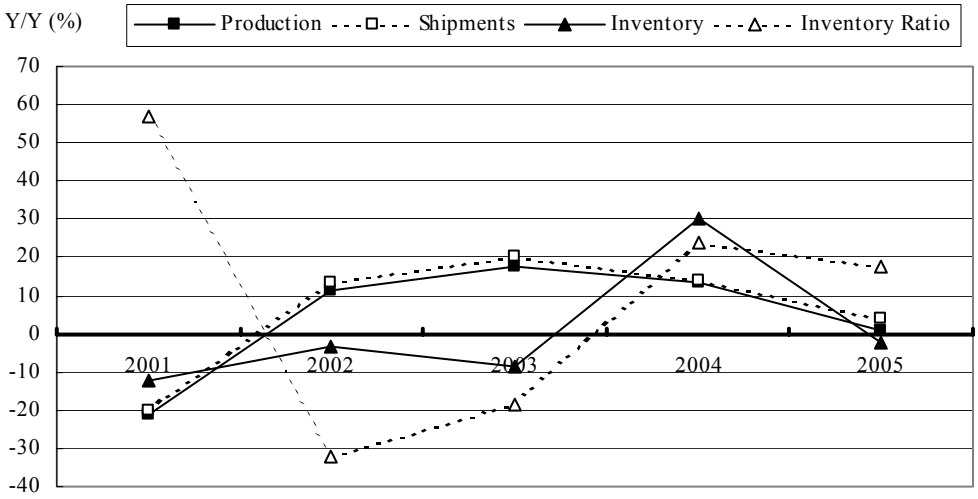


Source: "Annual Report on Machinery Statistics" (METI)

Diagram 1-10. Information & Telecommunications Equipment Sub-sector-specific Production Index Trends (Year-on-year)

(5) Electronic Parts/Device Sector Trends

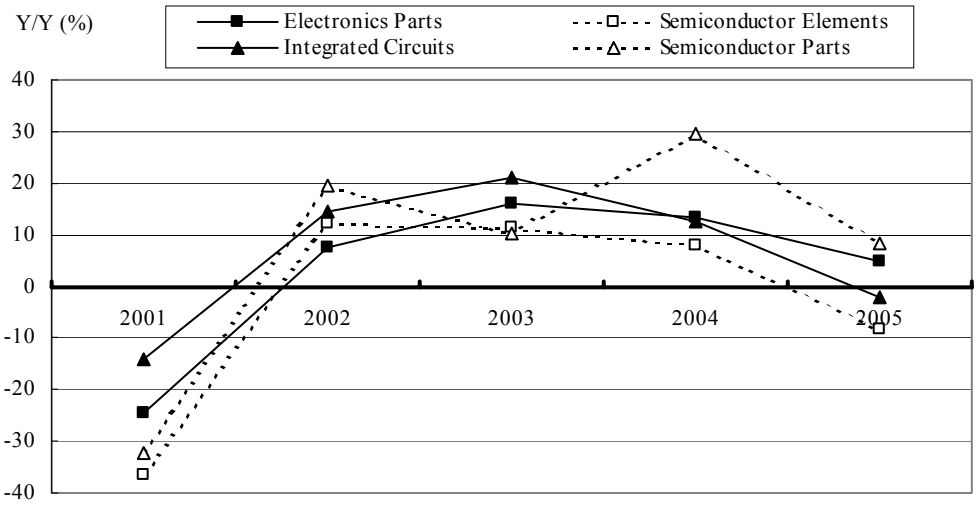
Diagram 1-11 shows year-on-year trends in electronic parts/device sector production/shipment/inventory indexes and inventory ratios. As the chart indicates, the 2005 production index (+0.8) dropped sharply from 2004. Similarly, the 2005 shipment index (+3.9) fell sharply below the 2004 index (+14.2). Furthermore, the 2005 inventory index (-2.3) fell far below the previous year's index (+30.4). On the other hand, the inventory ratio remained at a high level in both 2004 and '05.



Source: "Annual Report on Machinery Statistics" (METI)

Diagram 1-11. Electronic Parts/Device Sector Index Trends (Year-on-year)

Diagram 1-12 shows sub-sector-specific production indexes for the electronic parts/device sector. As the chart indicates, production across all sub-sectors experienced a downward trend in 2005. This trend was most evident in the fields of semiconductor parts and semiconductor elements. The production index for semiconductor parts fell to +8.3 in 2005 from +29.7 in 2004; likewise, the index for semiconductor elements fell sharply to -8.2 in 2005 from +8.1 in 2004. Additionally, the production index for integrated circuits fell from +12.7 in 2004 to -2.2 in 2005, and electronics parts fell from +13.4 in 2004 to +5.0 in 2005.

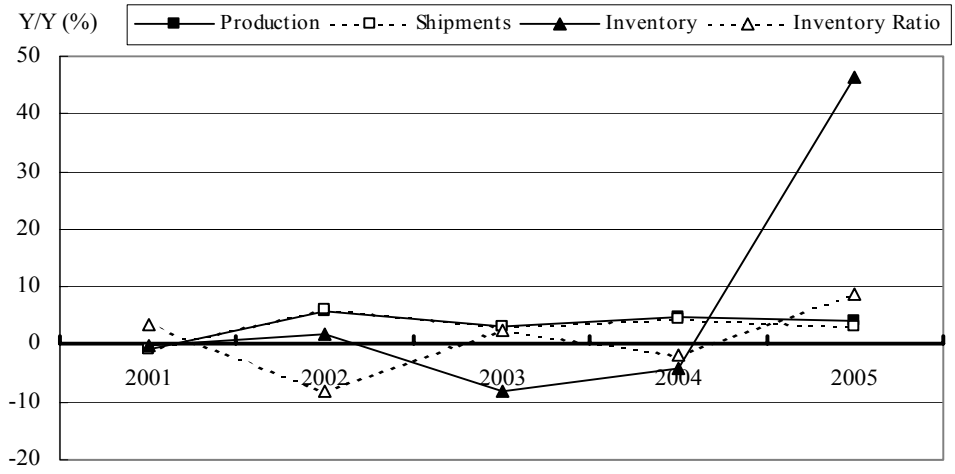


Source: "Annual Report on Machinery Statistics" (METI)

Diagram 1-12. Electronics Parts/Device Sub-sector-specific Production Index Trends (Year-on-year)

(6) Transportation Machinery Sector Trends

Diagram 1-13 shows year-on-year trends in transportation machinery sector production/shipment/inventory indexes and inventory ratios. As the chart indicates, the production index fell slightly from +4.6 in 2004 to +4.1 in 2005, showing stable performance. In the same way, the shipment index fell from +4.3 in 2004 to +3.0 in 2005. The inventory index, on the other hand, soared dramatically from a minus number in 2004 to +46.3 in 2005; the inventory ratio, too, rose from -1.7 in 2004 to +8.7 in 2005.

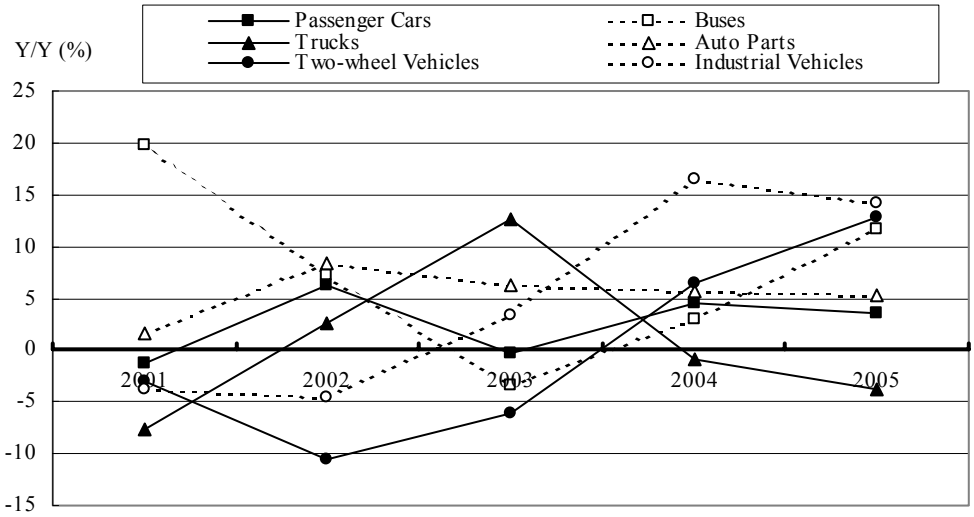


Source: "Annual Report on Machinery Statistics" (METI)

Diagram 1-13. Transportation Machinery Sector Index Trends (Year-on-year)

Diagram 1-14 shows sub-sector-specific production indexes for the transportation machinery sector. As the chart indicates, the index for industrial vehicles is a considerably high +14.2 and has remained high for the past two years. The bus production index rose sharply from +3.0 in 2004 to +11.6 in 2005, and the two-wheel vehicle index jumped from +6.4 in 2004 to +12.8 in 2005.

Although the production index for passenger cars has remained at a comparatively low level, it was still positive at +3.5. The index for auto parts dropped slightly from +5.6 in 2004 to +5.3 in 2005. The index for trucks, on the other hand, turned negative in 2004 and dropped further in 2005 to -3.7.

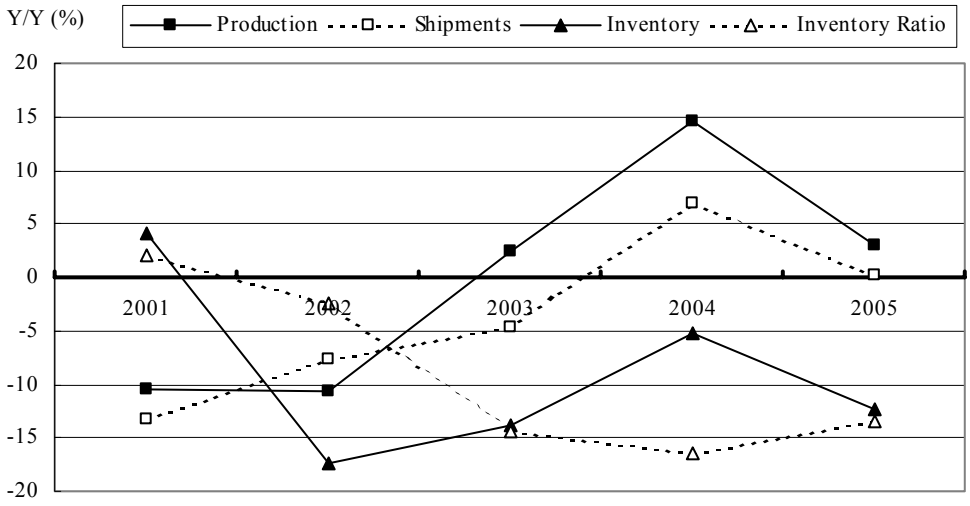


Source: "Annual Report on Machinery Statistics" (METI)

Diagram 1-14. Transportation Machinery Sub-sector-specific Production Index Trends (Year-on-year)

(7) Precision Instrument Sector Trends

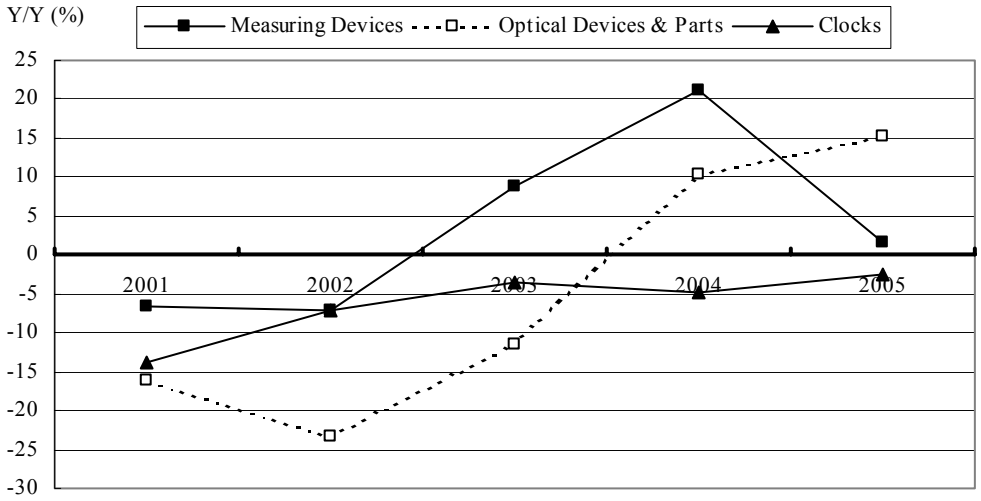
Diagram 1-15 shows year-on-year trends in precision instrument sector production/shipment/inventory indexes and inventory ratios. As the chart indicates, the production index dropped more than ten points between 2004 (+14.6) and 2005 (+3.0). The shipment index, too, dropped significantly from +6.9 in 2004 to +0.1 in 2005. The inventory index fell further into negative in 2005 (-12.3), returning to a level close to the 2003 index. Moreover, the inventory ratio, which was negative in 2004, remained negative in 2005 (-13.5).



Source: "Annual Report on Machine Statistics" (METI)

Diagram 1-15. Precision Instrument Sector Index Trends (Year-on-year)

Diagram 1-16 shows sub-sector-specific production indexes for the precision instrument sector. As the chart indicates, the production index for optical devices and parts continued an upward trend and reached +15.3 in 2005. On the other hand, the index for measuring devices dropped considerably from +21.2 in 2004 to +1.6 in 2005, and clocks, which show promise of future recovery, still had an index of -2.6 in 2005.



Source: "Annual Report on Machinery Statistics" (METI)

Diagram 1-16. Precision Instrument Sub-sector-specific Production Index Trends (Year-on-year)

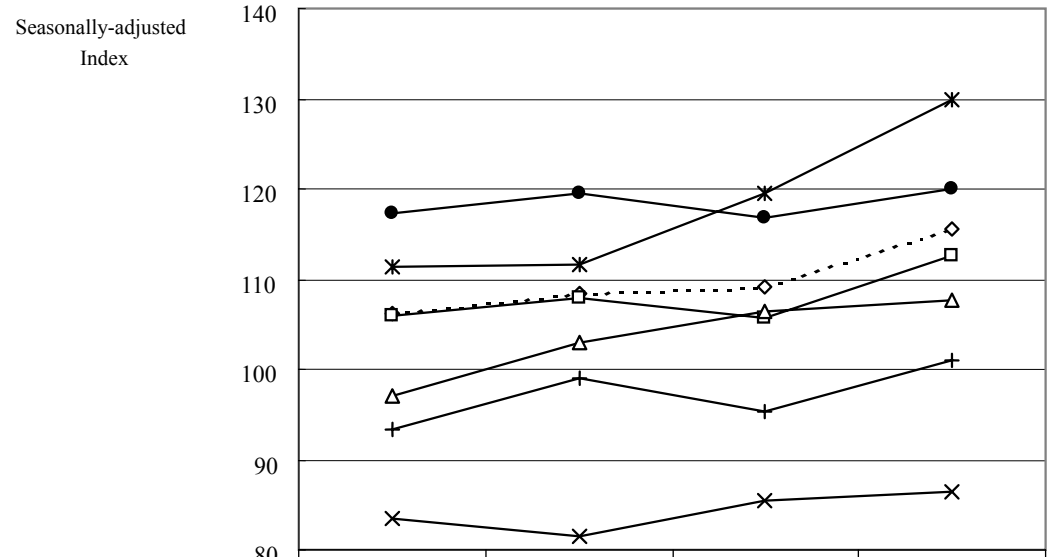
1-2. Machine Industry Index Trends in 2005

(1) Production Index Trends in 2005

Diagram 1-17 shows production indexes (seasonally adjusted; FY 2000=100) for machine and other major industry sectors in each quarter of fiscal 2005. As the chart shows, the overall machine industry production index (excluding steel ship and rail car manufacturing) remained relatively high throughout all four quarters of 2005; it reached a particularly high level (115.5) in the fourth quarter.

The transportation sector (excluding steel ship and rail car manufacturing) production index hovered around 120 and, as it did in 2004, boosted overall machine industry performance. Similarly, the electronics parts/device production index maintained a high level throughout 2005, but began to increase significantly in the third quarter; by the fourth quarter, it had reached 130.0. Like the transportation sector, the favorable performance of the electronics parts/device sector also boosted overall machine industry performance.

The general machinery production index rose sharply during the fourth quarter of 2005 to a high of 112.5. The electrical machinery index remained around 100 throughout 2005, indicating an upward trend, and the index for precision instruments rose to 100.9 (close to the 2000 index) in the fourth quarter. The production index for information and telecommunications equipment remained low, hovering around 85.



	1Q	2Q	3Q	4Q
Overall Machine Industry (excluding steel ship and rail car manufacturing)	106.1	108.5	109.2	115.5
General Machinery	106	108	105.7	112.5
Electrical Machinery	97.1	102.9	106.4	107.7
Information & Telecommunications Equipment	83.5	81.5	85.4	86.3
Electronics Parts/Devices	111.3	111.6	119.4	130
Transportation Machinery (excluding steel ship and rail car manufacturing)	117.2	119.6	116.9	120.1
Precision Instruments	93.4	99	95.4	100.9

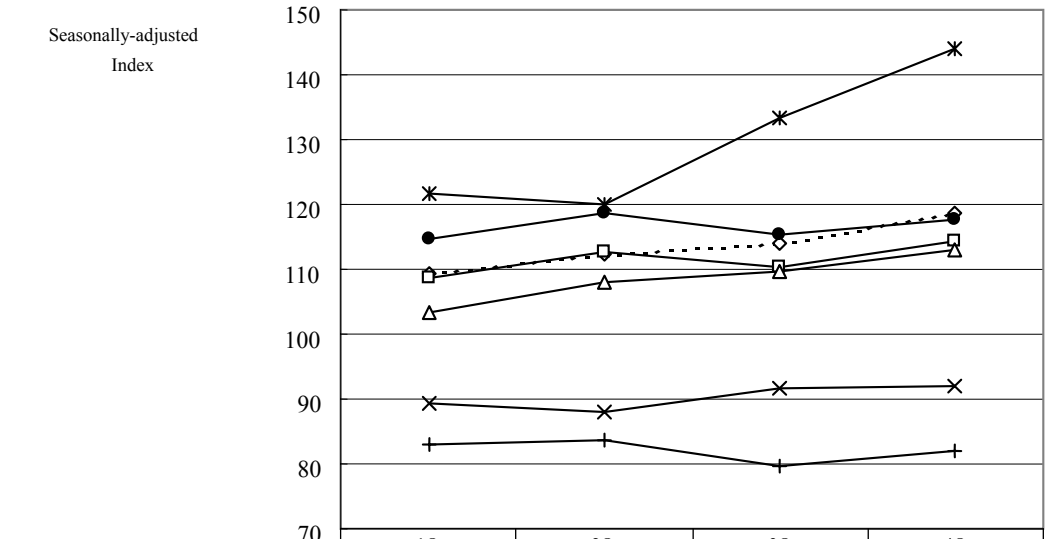
Source: "Annual Report on Machinery Statistics" (METI)

Diagram 1-17. Fiscal 2005 Machine Industry Production Quarterly Index Trends

(2) Shipment Index Trends in 2005

Diagram 1-18 shows shipment indexes (seasonally adjusted; FY 2000=100) for each machine industry sector in each quarter of fiscal 2005. As the chart shows, the overall machine industry shipment index (excluding steel ship and rail car manufacturing) remained at 112.0 or above through the last three quarters of 2005, reaching 118.7 in the final quarter. Electronics parts/devices showed particularly good performance throughout the entire year, reaching 133.4 and 144.1 in the third and fourth quarters, respectively. Performance in this sector boosted overall machine industry shipment performance.

The shipment index for the transportation machinery sector (excluding steel ship and rail car manufacturing) remained at a relatively high level throughout the year; the solid performance of this sector is similar to that of the industrial machinery and electrical machinery sectors. In contrast to the favorable performance of these sectors, the shipment indexes for precision instruments and information and telecommunications equipment remained at low levels. In particular, the shipment index for precision instruments plummeted to 79.9, indicating a serious situation. The index for information and telecommunications equipment rose above 90 in the third and fourth quarters; still, these results indicate that the sector lacks the strength to make a strong comeback in the near future.



	1Q	2Q	3Q	4Q
Overall Machine Industry (excluding steel ship and rail car manufacturing)	109.4	112.2	114.1	118.7
General Machinery	108.8	112.7	110.5	114.4
Electrical Machinery	103.4	107.9	109.8	113
Information & Telecommunications Equipment	89.5	88	91.8	92.1
Electronics Parts/Devices	121.6	119.9	133.4	144.1
Transportation Machinery (excluding steel ship and rail car manufacturing)	114.6	118.7	115.4	117.8
Precision Instruments	83	83.8	79.8	82

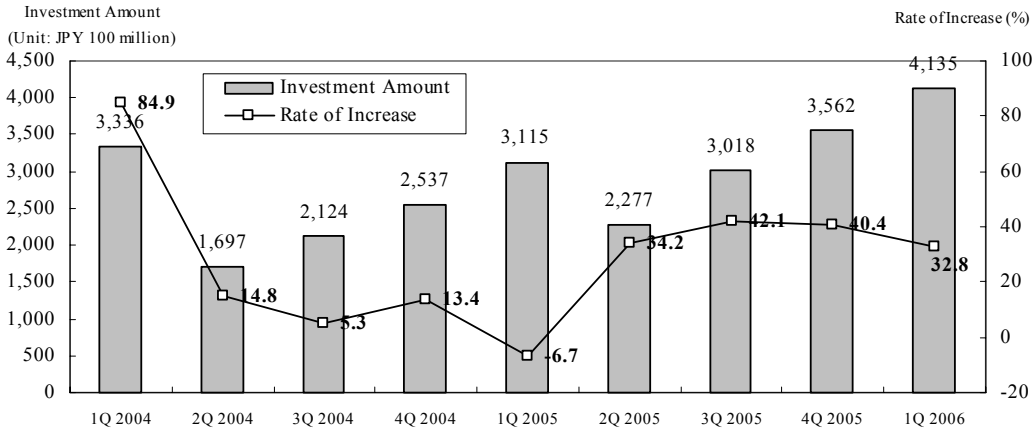
Source: "Annual Report on Machinery Statistics" (METI)

Diagram 1-18. Fiscal 2005 Machine Industry Shipment Quarterly Index Trends

1-3. Capital Investment in the Machine Industry

(1) Capital Investment in the General Machinery Sector

Diagram 1-19 shows capital investments in the general machinery sector between the first quarters of 2004 and '06. As the graph shows, investment in the first quarter of 2004 totaled JPY 333.6 billion and then dropped to JPY 311.5 billion in the first quarter of 2005; these figures indicate a trend of large and cyclical investments. By the first quarter of 2006, the total amount of investments reached JPY 413.5 billion, indicating that the sector has made aggressive capital investments once in four quarters.

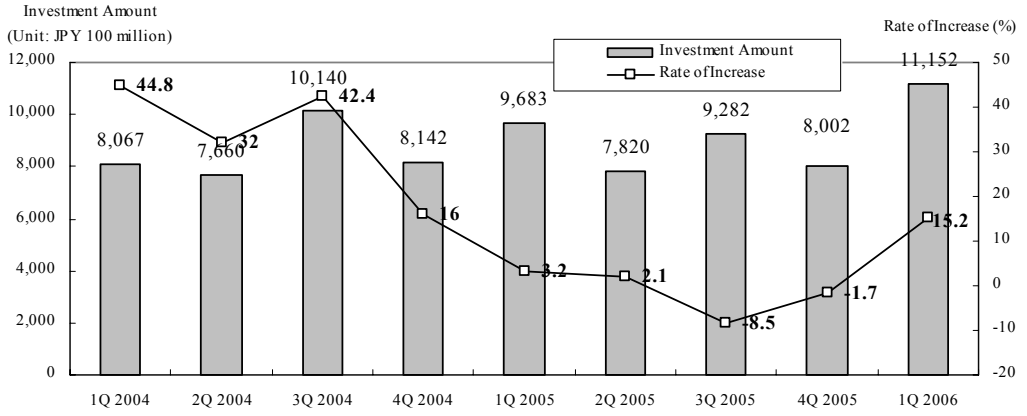


Note: "Rate of increase" is based on a comparison to the previous year.
Source: "Corporation Statistics Survey" (MOF)

Diagram 1-19. Capital Investment in the General Machinery Sector

(2) Capital Investment in the Electrical Machinery Sector

Diagram 1-20 shows capital investments in the electrical machinery sector between the first quarters of 2004 and '06 (statistics in and after 2Q 2004 include capital investments in both electrical machinery and information and telecommunications equipment sectors). As the graph shows, aggressive capital investments were made in 3Q 2004, 1Q 2005, 3Q 2005, and 1Q 2006; aggressive, cyclical investments were made every second quarter. The amount of investment reached JPY 1.115 trillion in the first quarter of 2006, showing an aggressive capital investment trend just like the general machinery sector mentioned before

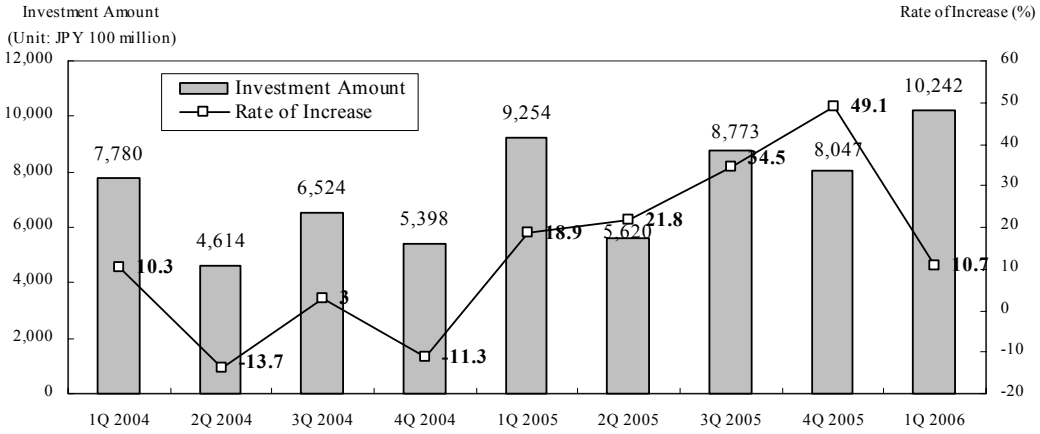


Note: "Rate of increase" is based on a comparison to the previous year.
Source: "Corporation Statistics Survey" (MOF)

Diagram 1-20. Capital Investment in the Electrical Machinery Sector

(3) Capital Investment in the Transportation Machinery Sector

Diagram 1-21 shows capital investments in the transportation machinery sector between the first quarters of 2004 and ’06. According to the graph, aggressive investments were made in the first quarters of 2004, ’05, and ’06, indicating a 12-month cycle. At the same time, total investments made in the third quarters of 2004 and ’05 surpassed those made in previous and following quarters, underscoring midterm attempts to bolster operations and indicating shortened investment cycles. At any rate, the total amount of capital investments made in the first quarter of 2006 JPY 1.0242 trillion indicates that this sector is taking aggressive measures to make capital investments.



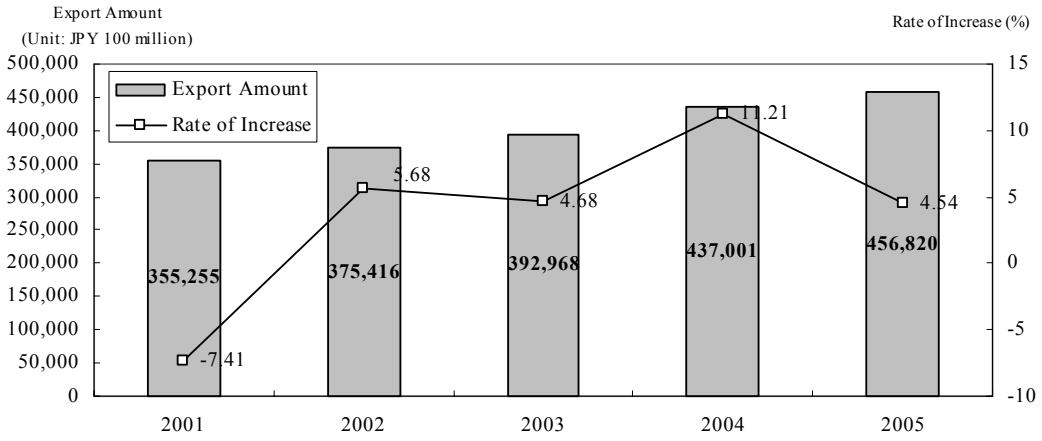
Source: “Corporation Statistics Survey” (MOF)

Diagram 1-21. Capital Investment in the Transportation Machinery Sector

1-4. Machine Industry Exports

(1) Overall Exports

Diagram 1-22 shows machine and device industry (general machinery, electrical machinery, transportation machinery, precision instruments) export amount and growth rate (year-on-year) for the past five years. As the graph shows, exports have increased since 2001, reaching JPY 45.7 trillion in 2004; even though imports slowed slightly since then, they still almost reached JPY 45.7 trillion in 2006, showing a steady increase in the export of machines and devices.



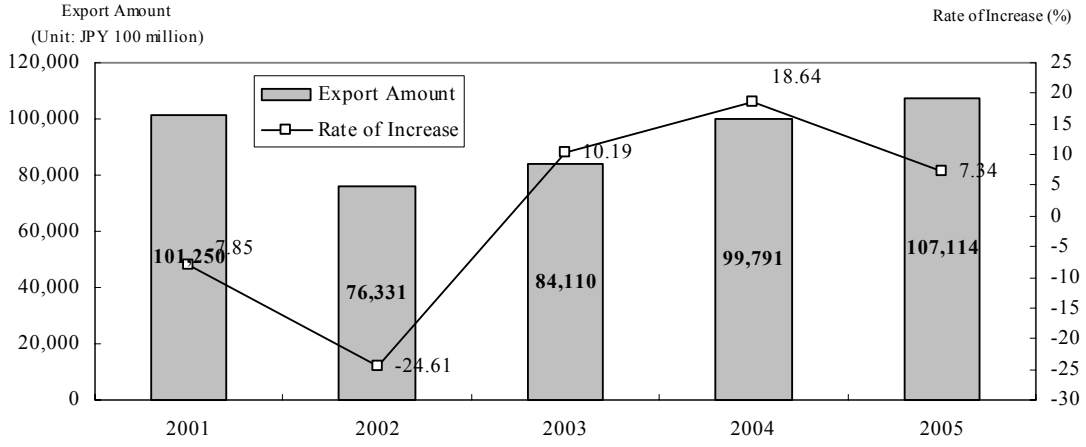
Note: "Rate of increase" is based on a comparison to the previous year.

Source: "Trade Statistics Database" (JETRO)

Diagram 1-22. Machines and Devices Exports

(2) General Machinery Exports

Diagram 1-23 shows trends in general machinery exports over the past five years. As the graph indicates, the amount of exports in 2002 (JPY 7.6331 trillion) fell sharply (-24.6%) compared to previous year figures; however, exports rebounded and reached almost JPY 1 trillion in 2004. In 2005, exports reached JPY 10.7 trillion, surpassing 2001 figures of JPY 10.125 trillion and indicating that imports in this sector were in an upward trend.

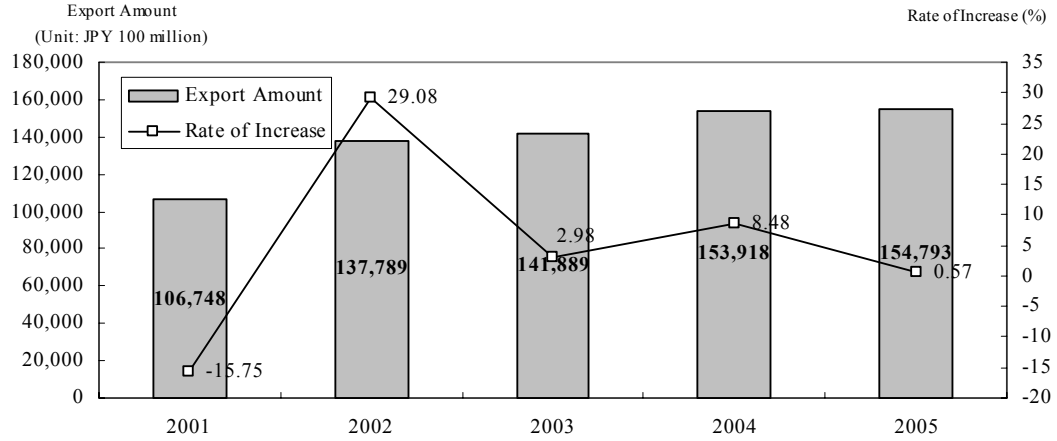


Source: "Trade Statistics Database" (JETRO)

Diagram 1-23. General Machinery Exports

(3) Electrical Machinery Exports

Diagram 1-24 shows electrical machinery exports over the past five years. As the graph indicates, the monetary amount of exports in this sector has remained above the JPY 10-trillion mark each year since 2001; the monetary amount of exports increased year-on-year up until 2005. However, the rate of increase of exports in this sector is considered to have reached a peak in 2002, when it was about 30%; since then, the rate of increase has continued a downward trend. In 2005, the rate of increase fell to 0.57%, showing the possibility of reduced momentum in export.

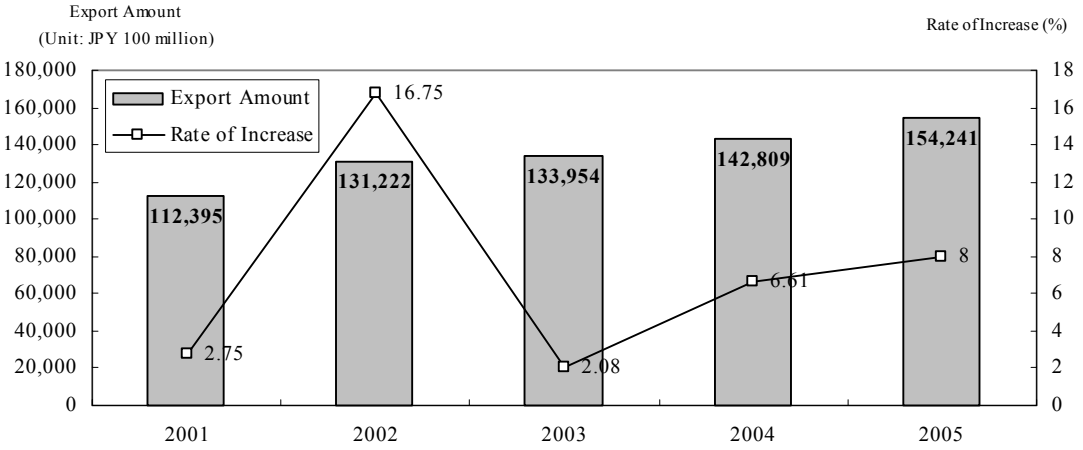


Source: "Trade Statistics Database" (JETRO)

Diagram 1-24. Electrical Machinery Exports

(4) Transportation Machinery Exports

Diagram 1-25 shows transportation machinery exports over the past five years. As the graph indicates, the rate of increase peaked to reach 16.75% in 2002; since then, exports have continued to show stable growth. In 2005, the monetary amount of exports surpassed JPY 15.4 trillion.

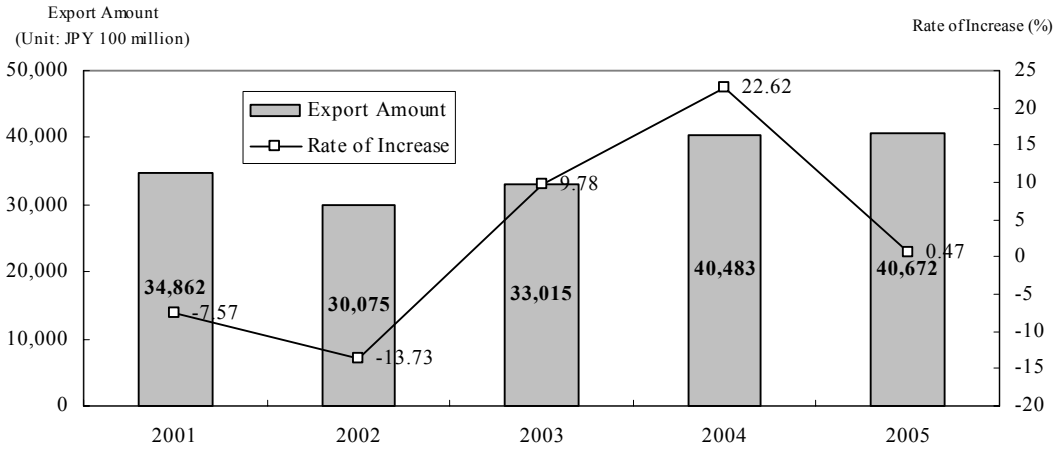


Source: "Trade Statistics Database" (JETRO)

Diagram 1-25. Transportation Machinery Exports

(5) Precision Instrument Exports

Diagram 1-26 shows precision instrument exports over the past five years. Although the rate of increase dropped to -13.73% in 2002, exports gradually recovered and surpassed the JPY 4-trillion mark in 2004. The rate of increase slowed down in 2005; still, the monetary amount of exports remained about JPY 4 trillion.



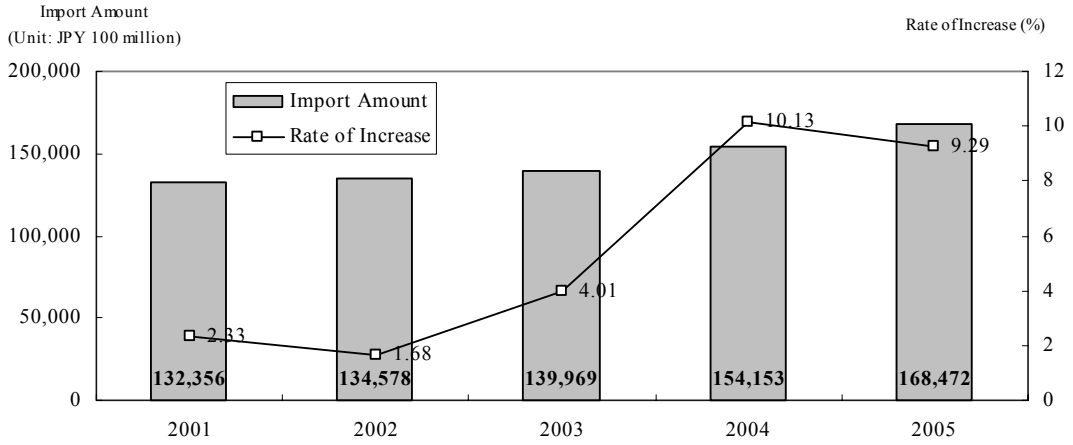
Source: "Trade Statistics Database" (JETRO)

Diagram 1-26. Precision Instrument Exports

1-5. Machine Industry Imports

(1) Overall Imports

Diagram 1-27 shows machines and devices industry import statistics. As the graph shows, the monetary amount of machines and devices imports has continued a dramatic upward trend since 2004; the rate of increase reached 10.13% in 2004 and 9.29% in 2005, and the amount of imports increased to over JPY 16.8 trillion.

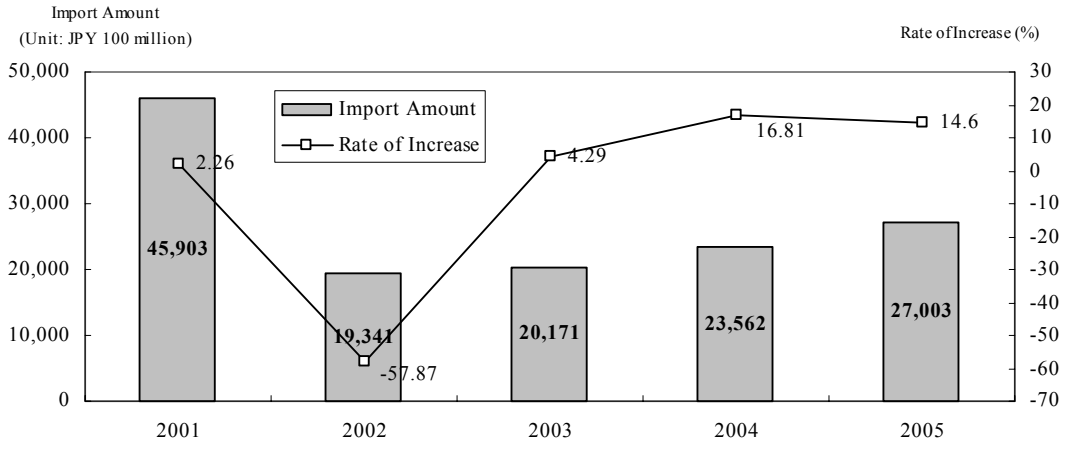


Source: "Trade Statistics Database" (JETRO)

Diagram 1-27. Machines and Devices Imports

(2) General Machinery Imports

Diagram 1-28 shows general machinery import statistics. As the graph shows, imports decreased drastically between 2001 (nearly JPY 4.6 trillion) and '02 (below JPY 2 trillion). In 2005, the amount of imports still hovered around JPY 2.7 trillion (These extreme figures are well supported by facts). This dramatic decrease of imports may be attributed to a decrease in imports from China; while relatively large volume of general machining were imported from China in 2001, these products caused controversy if they were worth the money. To put it the other way round, massive inflow is likely to have invoked reevaluation of Japanese products, showing underlying competitiveness of the general machinery industry in Japan.

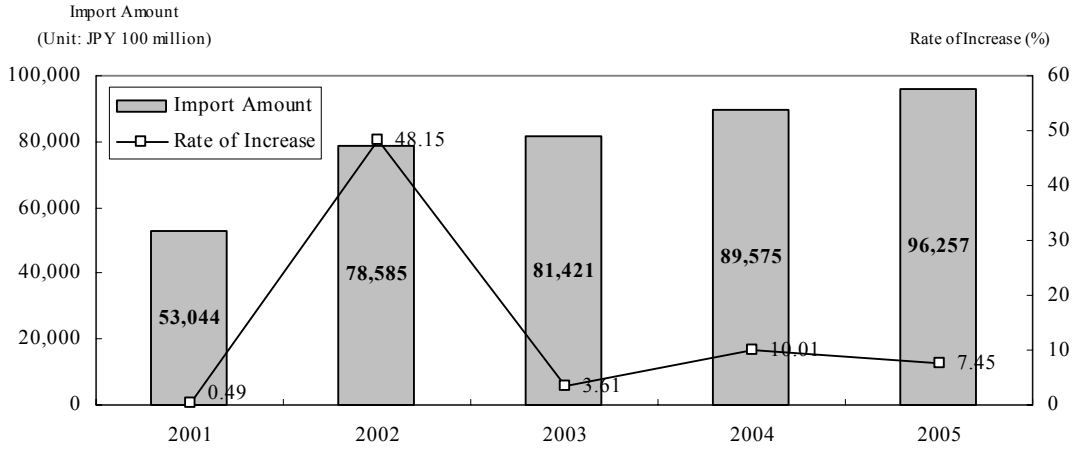


Source: "Trade Statistics Database" (JETRO)

Diagram 1-28. General Machinery Imports

(3) Electrical Machinery Imports

Diagram 1-29 shows electrical machinery import statistics for the past five years. As the graph shows, imports reached more than JPY 5.3 trillion in 2001 and then rose to more than JPY 9.6 trillion in 2005. The rate of increase marked a remarkable 48.15% in 2002. This trend underscores the extent to which this sector relies on global procurement and consumer product import. The monetary amount of imports in the electrical machinery sector is expected to continue to rise in the future.

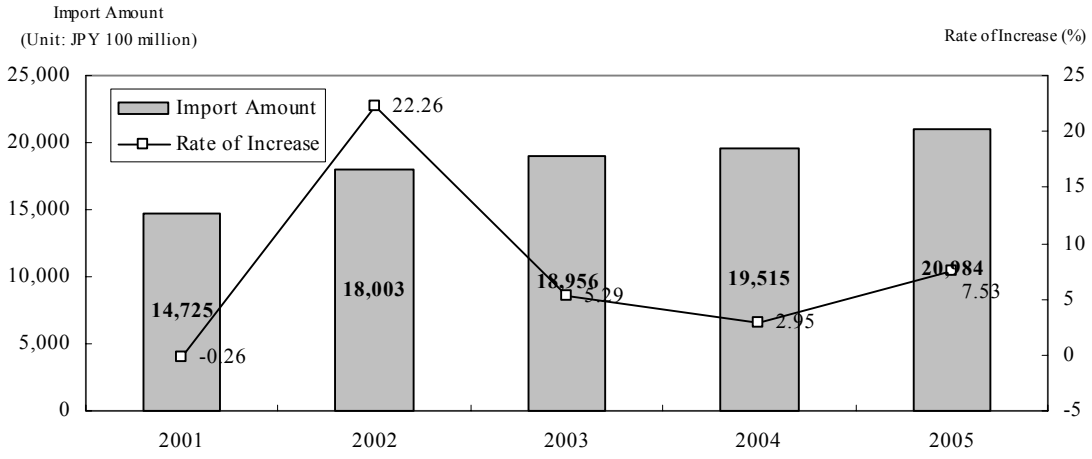


Source: "Trade Statistics Database" (JETRO)

Diagram 1-29. Electrical Machinery Imports

(4) Transportation Machinery

Diagram 1-30 shows transportation machinery import statistics. The monetary amount of imports has considerably increased year-on-year from 2001 to 2005 (over JPY 2 trillion). This upward trend may be attributed to globalization efforts in this sector; optimization of production/sales bases, however, is likely to lead to slower rate of increase in import in the future.

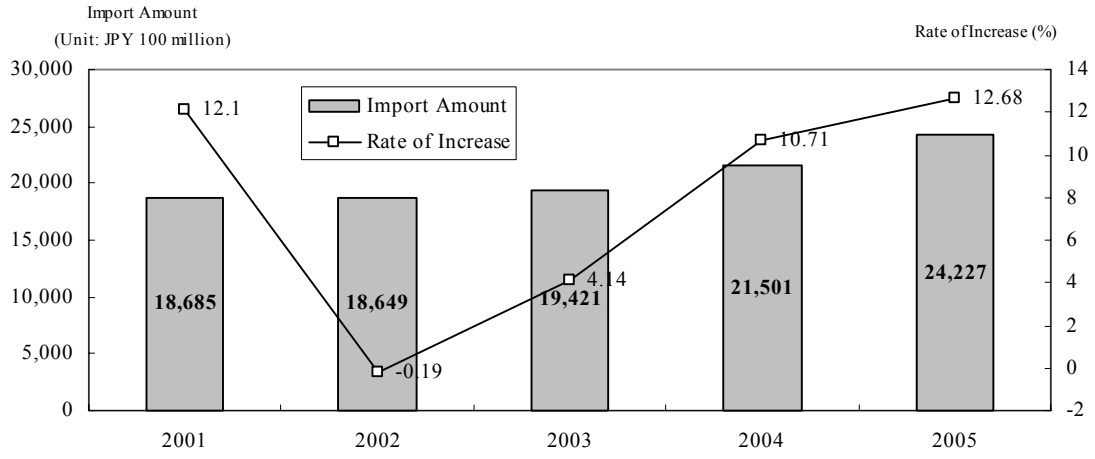


Source: "Trade Statistics Database" (JETRO)

Diagram 1-30. Transportation Machinery Imports

(5) Precision Instrument Imports

Diagram 1-31 shows precision instrument import statistics. As the graph shows, the monetary amount of imports changed little up until 2003; since then, however, the rate of increase has surpassed 10% each year. In 2005, monetary amount of imports reached a peak in excess of JPY 2.4 trillion, and shows signs of further growth in the future.



Source: "Trade Statistics Database" (JETRO)

Diagram 1-31. Precision Instrument Imports