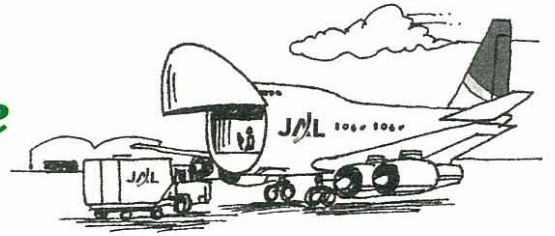


Air Cargo and Corporate Logistics Strategies



Shippers tend to think of air cargo as expensive, and it's true that it costs more than shipping by sea, when point-to-point charges are compared. But from the perspective of air cargo's role within the overall logistics flow—from the maker's factory to delivery of the shipment to the consignee—air cargo costs are very reasonable. Sora interviewed Hisaaki Matsuyama, vice president, Cargo Industry Affairs, JAL to learn about logistics trends among manufacturers who use air cargo.

Focus on Supply Chain Management

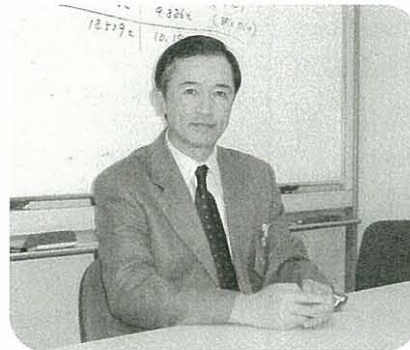
SORA: Why are enterprises paying more attention to logistics nowadays?

MATSUYAMA: A leading Japanese auto maker told us that until 20 years ago, they sourced most of the components for their factories from the immediate region where each plant was located. But today this maker has plants all over the world, making efficient, global-scale logistics of prime importance. But even companies that don't operate worldwide are keen to reduce inefficiencies in logistics. This is primarily because tough business conditions make it necessary for companies to operate more efficiently than ever, and more of them are adopting sup-

ply chain management (SCM) (see Fig. 1).

SORA: What is the relationship between SCM and air cargo?

MATSUYAMA: Many people believe that SCM means making procurement more efficient but in fact it's a



much broader concept. SCM is a business method for optimizing the entire process from procurement and production through to delivery of the finished product to the customer. It can be described as "just-in-time" procurement or an electronic version of the "kanban" system made famous by Toyota that applies to the process from procurement to product shipping. The aim of SCM is to minimize inventory, shorten lead time and improve cash flow, but for shippers, the primary emphasis is cutting down on inventory. Reducing inventory means they risk running out of components, so it's necessary to have a

reliable delivery method for keeping just the right amount of the needed materials on hand. That led shippers to take a closer look at air cargo, which is rapid and reliable.

SORA: What requirements do shippers have as far as shipping by air is concerned?

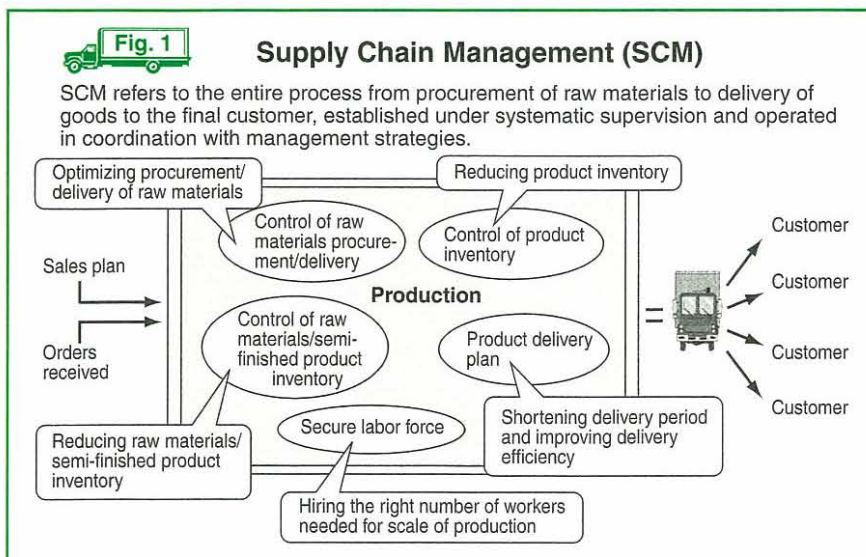
MATSUYAMA: A few years ago, airlines and forwarder associations surveyed the world's biggest shippers about what they wanted from air cargo. Their most frequent requests were for lower charges, time-definite service (delivering reliably by the agreed-upon time), timely information and speed. It may seem surprising that "speed" was only in fourth place, but when shippers were interviewed, they said that to them it was more important to receive a shipment reliably by the agreed-upon time than to just have a delivery arrive a few hours earlier than before. They also wanted timely and accurate information as to where their shipment was at a particular time. Given the good reliabil-



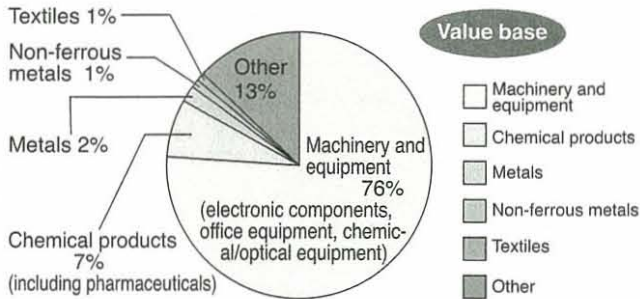
ity of air cargo, it's the ideal method to use for "just in time" shipments.

SORA: What are the most outstanding characteristics of air transport?

MATSUYAMA: Well, everyone thinks first of speed, naturally, but that's not all. Compared to overland or sea transport, air transport is safe, which means lower insurance premiums to cover the lower risk of damage to a shipment in transit. That's why air cargo is the most appropriate way of shipping expen-



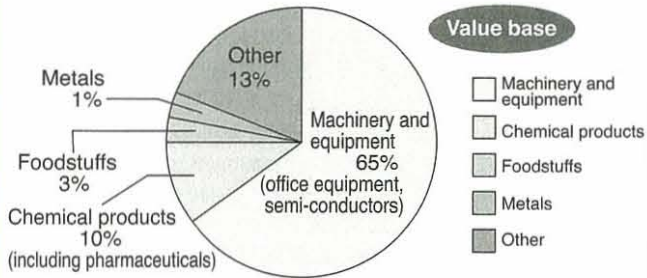
Main products shipped by air (exports)



(The Summary Report on Trade of Japan, 2001)

Home electronics → semi-conductors, computers, DVDs, digital cameras, video game consoles, office equipment

Main products shipped by air (imports)



(The Summary Report on Trade of Japan, 2001)

Foodstuffs: 3% by value base, 25% by weight

(Prepared based on figures from Outlook for Foreign Trade, Japan Tariff Association.)

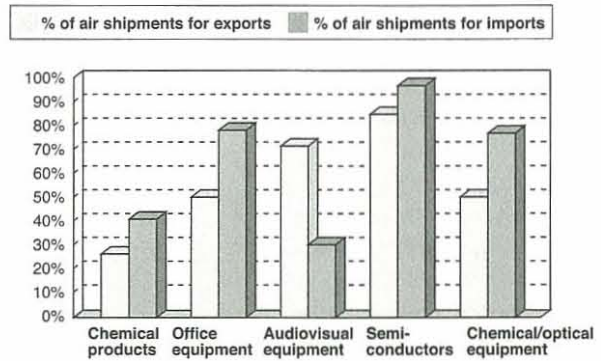
sive precision equipment, valuables or other costly cargo. Next, shipping by air is quick. The distance covered by a ship in one day can be covered in one hour by an airplane. In the case of fresh foods, freshness is crucial, so this kind of product is imported to Japan from all over the world by air. And products with a short life-cycle, like personal computers, are akin to fresh foods in that speed is of the essence. Third is punctuality. Some shippers in Japan use air cargo almost like a conveyor belt to send electronic components from Japan to their factories in Asia. Punctuality is therefore essential, as otherwise the factory product lines would be forced to stop if parts were not kept coming. But air cargo's 90% punctuality rate makes this possible. Lastly, air cargo flights are much more frequent than cargo ship departures.

denly have to send those components by air, because they would not reach the factory in time if shipped by sea. Or, in the case of a product recall due to defects, a manufacturer may have to send repair parts in a hurry. This is a passive reason for using air cargo but in the past few years, we've seen changes in how shippers use air cargo.

SORA: How have shippers' reasons for using air cargo changed?

MATSUYAMA: We still see a fair proportion of cases where shippers switch from sea to air cargo because they're in a hurry, but we are getting more business now where shippers planned on using air cargo from the start. Take high-

% use of air cargo (2001)



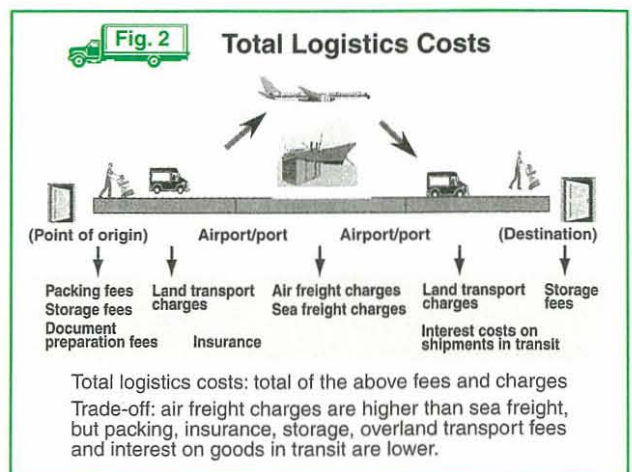
(Prepared based on figures from the Summary Report on Trade of Japan, 2001, Japan Tariff Association.)

From Passive to Active Use

SORA: Why do shippers use air cargo?

MATSUYAMA: There are various reasons, but the most frequent is that shipments won't reach destination in time if sent by sea, so they are sent by air. For example, a shipper experiencing a product delay may sud-

denly have to send those components by air, because they would not reach the factory in time if shipped by sea. Or, in the case of a product recall due to defects, a manufacturer may have to send repair parts in a hurry. This is a passive reason for using air cargo but in the past few years, we've seen changes in how shippers use air cargo. tech, high-value information technology products: most steppers (equipment for producing integrated circuits), digital cameras, and memory components are shipped by air. This is because SCM is well-established among the makers of these products and they want to keep inventory to a minimum. Even though air cargo transport itself is expensive, charges for everything else (packing, insurance, various ground service fees) are all lower than in the case of sea transport, so in some cases total costs (see Table 2) are pretty much the same. Alternatively, even though air cargo costs more, a shipper may still use it because of other considerations that make it more advantageous. So it's a trade-off between one cost being more expensive but others being lower. Sometimes, shippers will send products by air because they want them in the stores quickly so they can get a jump on market share. That's often the case with





video game consoles and other products that manufacturers need to have in stores for the Christmas shopping season.

Smaller Inventories Better

SORA: Why do shippers want to reduce their inventories?

MATSUYAMA: Keeping inventory entails various costs. Major manufacturers spend around 10% of sales on logistics—6% on transport, 3% on storage and 1% on other expenses. The figure of 3% spent on storage is not insignificant. What accounts for storage costs? Well, there are outlays for building or renting warehouses, and the equipment, utilities and staff expenses to run them. And a certain percentage of products in storage becomes soiled, broken or lost. Furthermore, assets that have been put into inventory are not productive, which means capital costs. All these expenses are proportionate to the amount of inventory held. Fig. 3

assumes twice the frequency of transport by air to transport by sea, with lots half the size of sea shipments being sent by air. But actually, there is only one shipment by sea every 10 weeks compared to twice-weekly shipments by air. This means 20 times more frequency by air and lots 1/20th the size. In such cases, only 1/20th the inventory needs to be kept on hand, at 1/20th the cost. Another cost factor that is just as important is product becoming obsolescent.

SORA: What do you mean by “obsolescent?”

MATSUYAMA: Japanese computer makers turn out new PCs about once every three months. Therefore, such products will only sell for about three months at a small discount. It's the same situation for digital cameras and mobile phones—product life cycles are extremely short. Moore's Law, which states that the number of transistors on a silicon chip will double every 18 months, will most likely continue to apply. In fact, personal computer and memory capacity doubles in about one year. Alternatively, if year-old products are in the stores, they will only sell at half-price or less. Inventory on the books at ¥100 will continue to have that worth on paper a year later, but it may actually be worth only ¥50 or even zero if the product is not moving. The loss of value of a product over time is called the obsoles-

cence loss. Information technology products become obsolete especially quickly, losing half their value over a year, so theoretically, 1% of value is being lost every week.

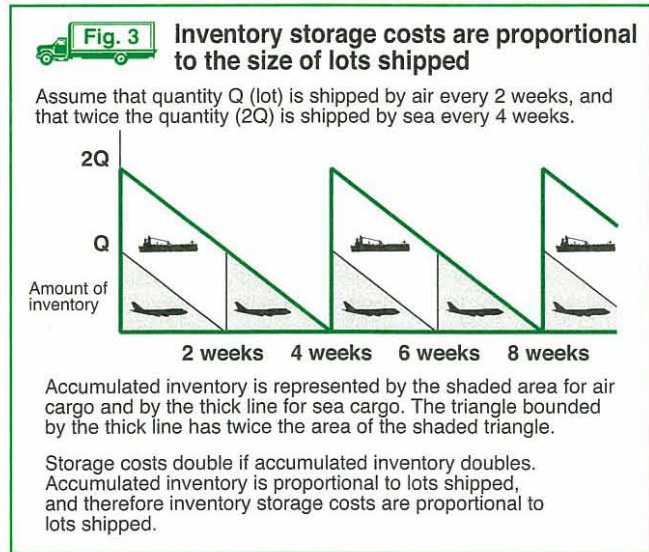
Not So Expensive Overall

SORA: How much less time does shipping by air take compared to shipping by sea?

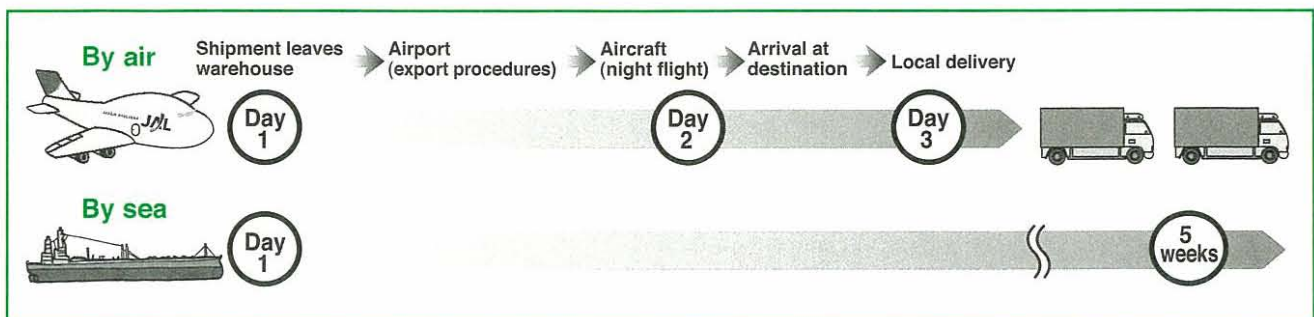
MATSUYAMA: It takes an airplane just one hour to travel the distance covered by a ship in one day. For example, it takes nine days for a container ship out of Tokyo to reach Long Beach, Calif. By air, it takes nine hours from Narita to Los Angeles, and 12 hours to New York. If the same shipment were going to New York, it would take an additional nine days by rail after offloading the containers on the West Coast, for a total of 18 days. By Tokyo to Rotterdam by container ship takes 24 days, but it's just 11 hours from Narita to Amsterdam. In addition to the time required from port to port or airport to airport, ground handling time is much shorter in the case of air cargo. For example, if a shipment is sent by air, it leaves the warehouse in the morning, is processed for export in the afternoon, and is usually loaded on that evening's cargo flight. It's the same at the destination, with the consignee receiving the shipment in a matter of hours after the aircraft has landed. Using shipments between Japan and the U.S. as an example, it takes only about three-four days, including time on the ground, door-to-door by air, compared to five weeks by sea.

SORA: And cost-wise?

MATSUYAMA: Well, it's impossible



personal computer and memory capacity doubles in about one year. Alternatively, if year-old products are in the stores, they will only sell at half-price or less. Inventory on the books at ¥100 will continue to have that worth on paper a year later, but it may actually be worth only ¥50 or even zero if the product is not moving. The loss of value of a product over time is called the obsoles-



to compare freight charges directly, because these vary depending on the size of the lot, type of product, and shipment density. There are air and sea shipping tariffs but these apply to a smaller percentage of shipments nowadays. In the case of ships, a large number of shippers pay freight charges based on service contracts with shipping companies. In the case of air cargo, most shipments go through forwarders, and discount rates from consolidated cargo tariffs* are applied. In general, air freight is at least double sea freight charges to several times that, but the average is seven-fold more expensive.

In addition to freight, there are expenses for packing, trucking**, insurance and terminal fees, but these are lower in the case of air cargo (see Table 1). But even when these expenses are added, a trial calculation based on certain assumptions, as in Table 1, shows that air cargo is over twice as expensive as sea cargo.

* Equivalent to passenger package tour group rates

** Fees for overland transport from the airport to the holding location (warehouse, etc.) specified by the shipper

SORA: So what is the cost comparison, when factors like warehouse expenses and losses due to product becoming obsolete are taken into consideration?

MATSUYAMA: In that case, there's very little difference between total costs of shipping by air and by sea, or it's in fact less expensive by air. Let's make the following sample calculation (see Table 2):

1) The difference in the transit time – four weeks – means a 2% obsolescence loss (I said earlier that this was theoretically 1% per week, 4% for 4 weeks, but let's put it at half that figure in this case)

2) Shipping by air means that inventory can be reduced, cutting down on storage expenses by 50%. (Above, I said that storage costs accounted for 3% of manufacturers' sales. Shipping direct by air makes

Table 1 Cost comparison of shipping by air vs. by sea (Part 1)

Shipping electrical products weighing 2,500 kg and with a volume of 15 m³ (shipment value ¥30 million) from a factory near Tokyo to the subsidiary's warehouse near Chicago in a 20-ft container.
(Unit: yen)

	By air	By sea
Land expenses (Japan)	75,000	127,000
Freight charges (between airports/ports)	1,250,000	222,000
To-door delivery	60,000	82,000*
Insurance	45,000	90,000
Total expenses	1,430,000	521,000

*Charges for rail transport between the U.S. West Coast and Chicago are included.

Expenses other than freight charges are lower by air than by sea, but total costs of shipping by air remain more expensive.

it possible to keep no inventory at all, but here we'll assume that inventory stock is reduced by 50%)
3) Interest costs are 2%, an expense in direct proportion to the number of days it takes to transport a shipment.

Based on these parameters, the difference in cost between air and sea transport virtually disappears.

SORA: What kind of future do you foresee for air cargo?

MATSUYAMA: For products with a short life cycle, there's only a limited window when they can be sold at no discount, so it's important to sell product immediately. Shipping by air can help reduce lead time, thus lengthening the products' period of sale. If product can reach markets four weeks earlier, it's quite possible to make a several-percent difference in sales.

As the examples cited have demonstrated, costs for storage and obsolescence are closely related to product's unit price per kg. The higher the unit price per kg, the more advantageous air cargo is.

Right now, the average unit cost of products being shipped by air is ¥10,000 per kilogram, but this rises to ¥30,000 per kg in the case of IT products.

I believe that shippers will increasingly turn to air cargo, since the pace of technological innovation shows no signs of slowing down, which consequently means that unit price per kg will continue to increase.

Table 2 Cost comparison of shipping by air vs. by sea (Part 2)

Evaluation with the addition of the following costs

- 1) The 4-week difference in transit time means a 2% obsolescence loss
- 2) Shipping by air means that inventory can be reduced, cutting down on storage expenses by 50%
- 3) Interest costs are 2%, an additional expense the longer it takes to transport a shipment

(Unit: yen)

	By air	By sea
Total expenses in Table 1	1,430,000	521,000
Obsolescence loss (Note 1)	0	600,000
Storage expenses (Note 2)	225,000	450,000
Difference in interest	0	46,000
Grand total	1,655,000	1,617,000

Note 1: Shipment value of ¥30 million × 2%

Note 2: The lot shipped is valued at ¥30 million, so storage cost is 3%, or ¥900,000. This ¥900,000, however, is the total for storage during procurement, manufacturing and distribution, so the subsidiary's storage costs are assumed to be half.

Grand totals reflecting obsolescence loss, storage expenses, interest, etc. are virtually the same for shipping by air and by sea.

SORA: So, depending on the perspective, air cargo isn't such a luxury after all. Are J-Products* the JAL Group's answer to customer needs for value-added products?

MATSUYAMA: That's right. JAL Cargo will continue to expand its line of such products, to encourage more and more customers to ship their cargoes by air.

* The overall name for JAL Cargo's line of value-added products, which includes J-Speed (for urgent shipments), J-Fresh (shipments of fresh foods and produce) and J-Art (shipments of art objects), developed to meet customers' needs.