

UDC 332

## FACTORS AFFECTING THE SELECTION OF TRANSPORTATION MODES TO TRANSPORT PRODUCTS: A STUDY ON MSME IN BATU CITY

Supriono\*, Fanani Dahlan

Department of Business Administration, Faculty of Administrative Science,  
University of Brawijaya, Indonesia

\*E-mail: [supriono\\_fia@ub.ac.id](mailto:supriono_fia@ub.ac.id)

### ABSTRACT

Transportation is important in the business world, not to exclude MSME depending on imported raw materials. There are factors affecting the selection of transportation mode. This study was conducted on MSME in Batu City depending on imported raw materials. Data collection was done using in-depth interviews involving the staff of the Department of Industry and Cooperative, business actors, and transportation companies as respondents. This study was descriptive qualitative employing data triangulation. The results showed the factors affecting the selection of transportation modes, i.e. urgency, weight of goods, volume of goods, dimensions of goods, and government regulations.

### KEY WORDS

Transportation, MSME, import, Batu City.

The key decision in logistics management is the selection of transportation modes for shipping or moving goods in and out of the company. The selection is part of the decision-making process in a transport activity that includes identification of appropriate transportation performance, forms of transportation, tariff negotiations and service levels, as well as evaluation on carrier performance (Monczka *et al.*, 2005). Decision-making in logistics management is done by a manager by considering several things, especially the moving of goods the company needs. Some of the criteria in logistic management decision making are not easy to measure.

The long-distance transportation currently has become very important for the development of efficient logistics activities, especially global logistics activities. The modes of transportation are grouped into five, namely the land routes, ocean freight, railways, airfreight, and pipes. The main factors, such as the total cost required, the volume of goods, the distance between an exporter country to the importer country, the timeliness of the goods arrived, the risks that may occur during the delivery, and the weight of goods, are highly considered in order to achieve efficient and effective imports, so production process can work well (Nasution, 2003). The transportation process to the destination usually involves more than one mode of transportation; however, the main transportation becomes consideration when delivering goods across the country, i.e. transportation from the country of origin to the destination country.

The performance of transportation operators can affect the effectiveness of all the logistics functions of a company; therefore, the process of selecting appropriate modes of transportation is critical to the success of the company. Factors involved in transportation system decisions lead to the development of approaches and models that involve not only multiple variables but also some goals that lead to optimal decision-making and solutions (Murphy and Farris, 1993). According to Meixell and Norbis (2008), research in the field of logistics to date has established a limited paradigm, and that this paradigm should be renewed, so research on transportation and logistics management must continue to be adapted to the current state of achieving good changes in transportation activities or transportation of goods.

## LITERATURE REVIEW

Abbas Salim (1993:6), transportation is the activity of moving goods or cargo and passengers from one place to another. In the transportation process, there are two most important elements, i.e. (1) transfer or movement and (2) physically change the place of goods (commodities) and passengers to other places.

In another literature, Nasution (1996:12) defines transportation as the transfer of goods and people from the place of origin to the destination. In this connection, three things involved are (1) a cargo that is transported, (2) available vehicles as a means of transportation, and (3) roads that can be passed. Transportation is a transfer or movement from the place of origin or from the place where the transportation activity begins to the destination or the place where the transportation activities are terminated. According to (Cooper *et al.*, 1994), "Logistics is the strategic management of movement, storage, and information relating to materials, parts, and finished goods in supply chain, through the stage of procurement, work-in-progress, and final distribution. Its overall goal is to contribute to the maximum current and future profitability through the cost effective fulfillment of customer orders". This shows that logistics is an activity done through a good process in order to achieve maximum profit as expected. Thus, visible in its role is that logistics emphasizes cost-effectiveness and service. Furthermore, Paddersen (1998) argues that the mode of transportation is the special mode of linear programming. The excellence of transportation modes is that they can be used to solve the problem of distribution of a commodity or product from a number of sources (supply) to a number of destinations (destination demand) with the aim of minimizing the cost of transportation that occurred. Transportation modes have a special characteristic, i.e. (1) there is a source or origin of goods, (2) there is a purpose for the transfer of goods, (3) there is certain amount of quantity of commodities distributed by each source and requested by a number of destinations, (4) commodities sent or transported from one source to a destination corresponds to the demand and the source capacity, and (5) the cost of transporting the commodity from one source to any destinations in accordance with the request.

Certain customer characteristics may also have an enormous effect on the selection of modes of transportation. Some characteristics also need to be considered for both local and international movement of goods. The main characteristics that are important to take into account are (1) the service level or type of service location, (2) constraints of delivery point (access, equipment, and so forth), (3) after-sales service needs, (4) credit rating, (5) incoterms (CIF or FOB), (6) order size preferences, (7) the importance of the customers, and (8) product knowledge.

## METHODS OF RESEARCH

This study was qualitative and data was taken through in-depth interviews with the staff of the Department of Industry and Cooperative Batu City, business actors, and the providers of the transportation modes. Interviews were conducted with open questions, so respondents could provide the widest possible explanation of the questions asked. Data analysis was done using Data Triangulation and Focus Group Discussion (FGD).

## RESULTS AND DISCUSSION

*Factors Affecting Selection of Transportation Modes by MSME in Batu City.* The authors conducted interviews with MSME using imported raw materials. The result showed that MSME usually used one of the transportation modes namely sea freight, airfreight, and hand carry. Shipping through the sea freight is still the most frequently used transportation mode for some reasons. The factors affecting the selection of transportation modes are as follows.

*Urgency.* Urgency can be interpreted as the importance of the value of goods to arrive in a timely manner at the production site. Successful production of a company is not only

determined by one person or one department alone but involves various parties within the company. Good coordination between departments within a company is indispensable. The purchasing department is obliged to purchase goods from importers work in coordination with the company's production department to know the importance of the goods and when the goods are needed and must arrive at the production site.

Planning and forecasting therefore becomes very important for manufacturing companies that produce goods such as MSME. The two determines whether goods are urgent or not. Planning and forecasting made by the company becomes a reference to determine the production process of goods, in which there are activities of purchasing imported goods. The existence of urgently needed goods or materials becomes the consideration for the purchasing department in determining what modes of transportation will be used in purchasing the imported goods.

An item is considered urgent when it is needed much that it must arrive at the production site quickly. For MSME, urgently needed goods is the one suddenly required by the production department due to NG (Not Good) in previous production activities that new raw materials are needed as soon as possible for subsequent production to complete the production process on time. If such a situation occurs, then the company will take the decision to use the quickest modes of transportation, i.e. through the air or hand carry to bring goods into the country quickly so as not to disrupt the production process.

When the imported goods are not in urgently needed, then the company will consider the following factors in the selection of modes of transportation, such as the weight of goods, the volume of goods, and the dimensions of goods. Usually non-urgent imported goods are regular imports or goods that have been routinely imported so the purchase is on schedule. If there is no request for a change of delivery schedule from the production department, the import of goods will use the usual mode of transportation as before.

*Weight of Goods.* The weight of the goods is the weight that can be measured using a unit of measurement. On import shipments, the weight of goods is a factor considered in the selection of modes of transportation. The weight of the goods to be imported affects the cost incurred for the import activity so the measurement is very important before the shipment process. Nasution (2003) states the cost of transporting by water or sea is relatively lower or cheaper than other modes of transportation.

Based on interviews with key informant on MSME or importers, the delivery through the air channel could be cheaper than the sea freight when the weight of imported goods is less than 100 kg. This is because the sea freight shipping costs incurred for the processing of documents does not consider the weight of the goods, meaning that the cost remains the same. Shipping by sea needs a warehouse rental at the port, which causes storage costs.

Freight or shipment by air and hand carry does not require storage fee because no matter how heavy the goods is, when it arrives at the airport, it will be directly sent to the company. The costs incurred for the processing of documents are also considered more economical by air if the weight of goods is less than 100kg. Thus, decision makers always take the weight of goods as consideration because it can affect the costs incurred.

*Volume of Goods.* The import of raw materials in the manufacturing industry is not done in small quantities, not to exclude for MSME. The current import intensity may decrease as compared to the previous few years because now many raw materials can be localized. However, the purchase of imported raw materials or goods is not done in small quantities or volume. The import of raw materials is done according to the demand of the production department to meet the needs of production and consumer demand.

For the selection of sea or air transportation mode, the volume of goods greatly influences delivery options. On airfreight shipments, large volumes of imports will use cargo because of insufficient cabin capacity when using hand carry options; in addition, airfreight through cargo on large volumes of imported goods is considered more economical. For the hand carry, the company uses it for small volumes of goods and goods in urgent status.

In the choice of transportation mode by sea or by ship, the volume of goods is also very much considered. It is explained by the informant that sea freight can use two ways. First, it uses Less Container Loaded (LCL), which is a partial delivery type where the goods to be

imported are collected first in the warehouse to be combined with other items to meet the quota to be loaded to in containers. Second, it uses Full Container Loaded (FCL), i.e. the type of delivery of goods by using one full container. Although the quantity of goods is more appropriate with LCL mode, if the shipper sends the goods by using a container, then this type of delivery is called the FCL. MSME or importers use LCL shipment if the volume of goods imported is small - LCL requires longer time than FCL shipment as goods must be collected first, but LCL is more economical and it has an estimation of arrival time as well. If the volume of imported goods is relatively large, then the company will use FCL as FCL offers cheaper price for large shipment.

*Dimension of Goods.* The dimension of the goods is the size of the goods. The size of the goods to be imported affects the company's assessment of the risks that may occur during transportation activities, for example, for plastic ore raw materials. If the dimension is small, airfreight is preferable. This is because the risk incurred when using the sea freight will be greater if the goods is in a small dimension.

The risk of losing or accidentally being combined with other larger items in containers is too big if the dimensions of imported goods are small. On a large dimension of goods, the company will consider other factors. The selection of transportation modes of imported goods cannot only considers one factor as the factors affect each other.

*Government Regulations.* Importing raw materials not only consider the internal factors of the company but also involves consideration of external factors. The key informant stated that government regulation was an external factor highly considered when determining the modes of transportation. The government regulation being considered is whether there is any cooperation between the country of origin of the imported goods and the destination, such as the exemption of import duties on goods. Government and inter-state cooperation on import duty exemptions is strongly considered as this affects the calculation of the total cost to be incurred by the company. The choice of modes of transportation on the import of regular goods will consider and adapt one factor with another to determine the modes of transportation to be used.

*The Selection Process of Transportation Modes by MSME in Batu City.* MSME or importers are often make purchases of materials or raw materials for production from other countries. All purchase activities, production items or non-production items, are under the responsibility of purchasing department. The decision maker at the department as well as the key informant in this study was Mr. Herman as the owner of MSME or imported. Raw materials or imported materials are included in the production items and the process of selecting modes of transportation to be used is under the supervision and approval of the key informant.

The process of choosing the transportation mode in this company starts from the Purchase Request (PR) received from the production department itself and has been approved by the purchasing department (owner). PR (Purchase Order) is in the form of material production needs that will be ordered to the supplier abroad. After the Purchase Order is approved, then the procurement will create a Purchase Order (PR) that will be sent to the supplier abroad. The key informant said that almost all suppliers were regular suppliers, i.e. suppliers who are accustomed to receive orders continuously so there has been any problems contacting the supplier to make material ordering.

When receiving a Purchase Request (PR) from various departments about what material should be purchased and imported, the procurement department immediately knows the form, quantity, weight of the goods and the schedule of the goods to be used, as stated on the Purchase Request (PR); thus, it is easy to determine modes of transportation to be used for import activities. If the goods requested in the PR are numerous and not urgently need, then the company will choose to use the sea freight because the cost will be efficient; yet, if the goods are urgently needed, then the company will use the airfreight to avoid the delay in the production process. If the imported goods are small and not urgently needed, the company will use the airfreight, as it relates to the shipment effectiveness and the risk of missing in the ship that may occur when goods of small quantities are sent by sea. The key informant said that regardless of the weight or quantity of imported goods, if the imported

material was urgently needed, then the company would still use the airfreight even though the cost would be higher; this was done to avoid delays in production activities and supply of goods to consumers.

## **CONCLUSION**

Based on the findings, some conclusions can now be drawn. The factors affecting the selection of transportation modes, i.e. urgency, weight of goods, volume of goods, dimensions of goods, and government regulations. The purchasing and procurement department determines the process of selection of MSME transportation modes in Kota Batu, both are decided by MSME owners. MSME using the same imported raw materials are suggested to cooperate, so they can order raw materials in larger capacity, thus reducing transportation costs. Further research is expected to focus on the effectiveness of the use of import-export-based modes of transportation in Batu City.

## **REFERENCES**

1. Abbas, S. H. A. (1993). *Manajemen Transportasi*. Jakarta: PT. Raja Grafindo.
2. Meixell, M. J., & Norbis, M. (2008). *A review of the Transportation Mode Choice and Carrier Selection Literature*. USA: Department of Management, Quinnipiac University, Hamden, Connecticut.
3. Cooper, M. C., & Ellram, L.M. (1994). Characteristics of Supply Chain. Management and the implications for purchasing and logistics strategy. *The International Journal of Logistics Management*, 4(2), 13-24.
4. Monczka, R., Trent, R., & Handfield, R. (2005). *Purchasing and Supply Chain Management*. Mason Ohio: Thomson South-Western.
5. Nainggolan., et al. (2005). *Teori Ekonomi Mikro (1st Ed)*. Malang: Pondok Edukasi.
6. Pedersen, E.L., & Gray, R. (1998). The transport selection criteria of Norwegian exporters. *International Journal of Physical Distribution &Logistics Management*, 28(2), 108.