



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.



CANADIAN TRANSPORTATION RESEARCH FORUM
LE GROUPE DE RECHERCHES SUR LES TRANSPORTS AU CANADA

PROCEEDINGS OF

SEVENTEENTH ANNUAL MEETING

CANADIAN TRANSPORTATION RESEARCH FORUM

Volume 1

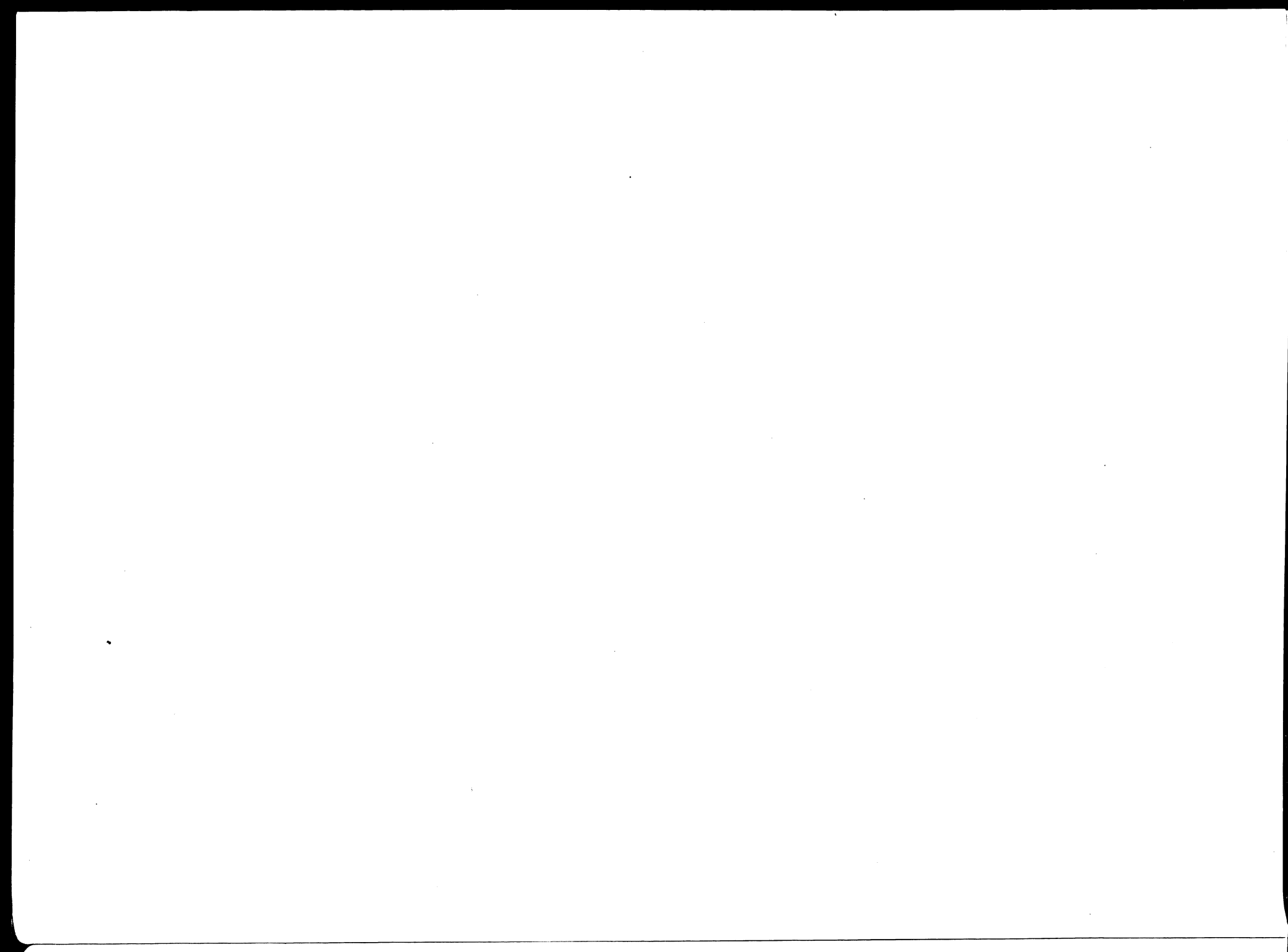
MONTREAL, QUEBEC

MAY 26, 27 & 28, 1982

Compiled by: R. Lande
&
K. Tansey

SESSION VII

"COMPETITION"



The author wants to thank the Ecole des Hautes Etudes Commerciales of Montreal for providing the financial support for this research, the participating companies' executives, and his friends and colleagues, Gunnar Sletmo, Richard Wright and Roger Bennett for their fruitful comments.

TYPOLOGY OF PHYSICAL DISTRIBUTION
SYSTEMS IN MULTI-NATIONAL CORPORATIONS*

JACQUES PICARD*

*FACULTY OF MANAGEMENT, MCGILL UNIVERSITY

*THIS WORK MAY NOT QUOTED OR COPIED WITHOUT THE EXPRESS CONSENT
OF THE AUTHOR.

TYPOLOGY OF PHYSICAL DISTRIBUTION
SYSTEMS IN MULTI-NATIONAL CORPORATIONS

I INTRODUCTION

An essential part of any manufacturing company's set of decisions is its distribution policy. This is very often referred to in the marketing literature as the "Place"¹ or "distribution mix"² decision. This set of decisions might be, in turn, divided into two subsets - channel decisions and physical distribution (logistics) decisions. Channel decisions deal with the choice of intermediaries between the producer of a good and the final user. Physical distribution decisions deal with the arrangements for "locating, stocking and shipping a company's goods to meet the service requirements of the marketplace."³

In order to optimize its physical distribution decisions, a firm should attempt to establish a network making it possible to minimize the "total distribution cost"⁴ involved in supplying a given level of service to a given client.

In principle, a company's logistics system should not always be predetermined by the choice of the distribution channel but should rather be established in terms of overall strategy and total distribution costs. Indeed, it is not always necessary for the product to physically pass through each level of the distribution channel, and the physical flow of merchandise can be "shorter" than the title and promotion flow. For example, some companies find it more efficient to send the merchandise directly to the final customer, although the dealer or another type of middleman might have taken title of it in between. Those attempts to "bypass" one or several levels of the distribution channel (as physical holders of the goods) is often encouraged by the middlemen who

*Included in this total distribution cost (T.D.C.) are the transportation, shipping, order processing expenses, handling charges, packaging, freight insurance and storage costs (warehouse operating costs, warehousing expenses and stock possession expenses; cost of capital, aging, damages ...) etc.

want to push the inventory holding function back to the manufacturer in order to reduce their own inventory holding costs.*

If the idea -that the physical flow of merchandise does not necessarily coincide with the title and promotion flow, but should rather be determined by a more global corporate strategy⁵- is becoming accepted for domestic sales, the question can be raised, "Does this principle work equally for international sales where the types of channels are different?"

The answer to this question will necessarily depend on the type of intermediaries used. A firm can sell its products abroad through three basic types of intermediaries:

1. Agents
2. Distributors or dealers
3. Sales subsidiaries.

An agent does not take title to any merchandise. His role is to promote the products of a foreign company to local potential customers. When an order is processed the manufacturer generally sends the goods directly to the customer. The question raised is, therefore, non-relevant in the agent's case. A distributor, however, takes title of the exporting company's product, and in most cases holds some inventory, since the main reason that a company would use his services rather than an agent's is for his capacity to stock the product in bulk and sell to various customers. In general the problems with international distributors are very similar to those encountered with their

*This phenomenon is part of what has been called the shifting of functions and responsibilities from one institution to another in a distribution channel. It should be noted, however, that the physical flow of merchandise might also be "longer" than the title flow. This will happen, for example, if a manufacturer uses a distribution utility (companies taking possession of the product without taking the title to it) or a central distribution facility.⁵

domestic counterparts. They are interested in minimizing the cost of stocking and distribution and try to push back the inventory holding function.

The sales subsidiary differs from the two above mentioned types of intermediaries in that it is owned by the exporting foreign company.

The role of a sales subsidiary is to organize and facilitate the marketing of products from the parent company (or one of its manufacturing subsidiaries) in a foreign market. In addition to distributing products in the assigned market, it involves the organization of advertising and various promotional campaigns, determining prices, providing customer services and supplying the head office with the information to adapt products to the local market. The sales subsidiary also assures the firm's permanent presence in a foreign country.

Traditionally, the sales subsidiary abroad has also been responsible for the stocking and physical distribution of the parent company's products in its markets, the responsibilities being shared in the following ways: The parent company tries to determine the best way of getting the merchandise to the warehouse of a subsidiary which in turn attempts to determine the best way to send the products to the clients. However, by doing that there is a risk of encountering sub-optimizations.*

Indeed there might be situations where it could be cheaper (without any reduction in quality of customer service) to ship merchandise to the next

*This phenomenon occurs when each organizational member or unit of an organization accomplishes its task as well as possible but without total optimal results.

level of the export market distribution channel (a distributor or wholesaler or directly to the final user) without having it pass physically through the subsidiary, which would then only be playing the role of transaction intermediate. The stocking of merchandise might, therefore, not only be considered as a secondary function of the sales subsidiary but also one of questionable importance as it depends on a more global logistics policy. This leads us to the purpose of this study which is to: 1) investigate the different models of physical distribution that are available to corporations with sales subsidiaries abroad, 2) understand their advantages and limitations, 3) examine what factors affect their uses.

II PRESENT STATE OF THE ART

Most of the existing literature on international physical distribution management comprises articles connected with specific problems or opportunities regarding international transportation, documentation, warehousing, packaging, insurance, parts facilities, etc.*

Most of these articles are either based on an interview with a company's executive or describe procedures used by an organization. Although these articles are highly informative, the field of international physical distribution management and organization suffers nevertheless from a shortage of conventional research and conceptualization. Furthermore there is (to the author's best knowledge) no widely disseminated published material dealing with the interface of physical flow of merchandise and international channels of distribution.

*An excellent, although a little outdated, bibliography on these subjects has been selected and annotated by Max L. Densmore and Wesley E. Patton III, "A selected and annotated bibliography on international physical distribution," Center for Business and Economic Research, Graduate School of Business, University of Alabama, 1973.

In an area definitely lacking systematic research, there was a need for an exploratory and conceptual study and as such the methodology used was selected to serve that purpose.

III METHODOLOGY

Interviews were conducted in the years 1978-1979 with executives of 40 multi-national corporations (7 European and 33 American). In six cases the interviews were conducted with subsidiaries managers and the rest of the time with headquarters personnel. Twenty of the companies included in the sample were in the Fortune 500 list (over \$379 million sales a year); eight companies were in the second Fortune 500 list (over \$110 million sales a year). The objective of those interviews was to understand the way physical distribution operations to foreign markets were conducted, and in order to do this, it was necessary to obtain a very clear and detailed description of the procedures used. As a consequence the interviews were quite lengthy and loosely structured.

IV BASIC MODELS OF PHYSICAL DISTRIBUTION

A content analysis of the interviews revealed the existence of four basic models of physical distribution.

A. The Classical System: Among other functions the subsidiary serves as a warehousing system. Merchandise is shipped to subsidiary warehouses and released as orders come in. This model is generally characterized by a relatively large storage system (which might include several warehouses located in different parts of the country), reducing the need for frequent and speedy transportation. Large quantities of merchandise are shipped by the cheapest possible means of transport from the country of manufacture to the subsidiary.

B. The Transit System: In this system the subsidiary warehouse(s) serves only as a transit center. Consequently merchandise will be sent there only a short time before being sent on to the next level of the distribution channel.

C. The Direct System: In this system merchandise is sent directly from production site to the final user, or to the next intermediary in the subsidiary's distribution channel. Although the subsidiary will have organized the transaction it will never have possessed the merchandise from a strictly physical point of view.

D. Multi-country Warehouse: When a company has subsidiaries in a few countries in an area, it might have a central warehouse serving all those countries. Goods will be shipped from the manufacturing plant to the central warehouse. From there shipments will be made either to various subsidiary warehouses or directly to the next level of their channel of distribution. The multi-country warehouse concept incorporates a few variations. It can be used as "a transit warehouse" or as a "stocking warehouse" (as in the classical system). In Europe, the central warehouse will generally be established in one of the countries where a subsidiary is located and under its control. Some companies, however, have a bonded central warehouse with a management independent of any of the subsidiaries it supplies. In some cases, though, the central warehouse will be located outside the geographical area it serves. That is the case, for example, of an American company whose central warehouse for South America is located in Miami, Florida (geographically close to the market, high frequency of airflights to all important South American cities, etc.)*

*The multi-country warehouse system differs from the three above mentioned models to the extent it must be associated to one of them. In other words, from the multi-country warehouse goods will be shipped to the final user through one of the three modes (classical, transit or direct). To that extent it should not have been included in a typology since this word implies that the categories be mutually exclusive. However, since this last model represents a different set of advantages, opportunities and problems, the author decided to sacrifice the rigor of the form.

Obviously, infinite varieties of these basic systems exist. However, every mode used by the different multi-national corporations contacted can be classified in one of those basic modes. It is also to be noted that the company need not choose any one of these physical distribution systems to the exclusion of the others. In fact, different systems may very well be used simultaneously by the same firm for different products, at different periods of the year, for different countries, different clients, etc. This practice should be commended since it obeys one of the most important innovations in the physical distribution field in recent years; the "distribution differentiation" concept.⁶ Although this concept meant originally "differential treatment of various product line items in their distribution," the basic philosophy can be extended to the international marketing field as the "implementation of different logistic policies in varying product-market situations."

V ADVANTAGES AND LIMITATIONS ASSOCIATED WITH THE DIFFERENT MODES

In this section an attempt will be made to delineate the opportunities and problems associated with each one of the different modes.

A. The Classical System

This system has a number of advantages. With it, the manufacturer has the lowest frequency of shipments between the manufacturing unit and the overseas selling unit for a given level of service.

1. Inexpensive Transportation: A company can use a slower (generally cheaper) transportation mode between the country of manufacturing and the sales subsidiary warehouse. In trans-oceanic shipments, this will usually mean the use of ships (cheaper than air-cargo for bulk shipments*).

*For small volume shipments, however, airfreight may be cheaper under certain circumstances.

2. Consolidation of shipments: This system provides great potential for consolidation of shipments and this, in turn, allows maximum utilization of cargo rebates.

3. Documentation: The use of the Classical system limits the amount of documentation (export and import licences, shipping, documents, etc.).

4. Duty: Duty is paid on intra-company transfer price, and not on the customer's price.

5. Buffer Stock: This system gives the subsidiary a buffer stock (also called safety stock) which represents better protection against interruptions of supplies (which could arise because of transportation strikes, excess demand in other company's markets, etc.). The existence of a buffer stock has, in turn, an important psychological impact on the customers who tend to be less reluctant to buy foreign goods. This was clearly pointed out by one of the respondents (manager for international distribution in a U.S. company) "Our subsidiaries' managers think that stock possession gives them a relative advantage in that they might tell the customer 'We can supply you out of stock here' rather than 'We can supply you by air from the U.S.'"

On the other hand the classical system has a major drawback: The other components of the "total distribution cost" are generally higher than in any other system. In particular, the storage costs are high because the subsidiary keeps a large warehouse complex and a large amount of stock as a result of the low frequency of shipments.

B. The Transit System

The most important advantage this system possesses in relation to the previous one is that it allows the reduction of storage costs at the subsidiary level since the frequency of shipments from one country to another is much

greater. Although the storage costs at home will increase, they will not rise to the same extent. The reason is the following: Safety stocks are generally established by a company to protect itself from stock-outs in case of an unexpected increase in demand. By centralizing the companies' stock in one location, the total amount of safety stock required for a given level of protection against stock outs will be smaller than if each of the subsidiaries kept its own, since the potential variance in demand in the whole world will always be smaller (in relative terms) than the potential variance in any country in particular. However, to obtain the same level of service and coverage of the market than in the classical system, transportation costs are higher for two reasons: 1) rush orders will not be able to be supplied from the local warehouse and consequently greater use of faster means of transportation (also more expensive) will be required; 2) the potential for consolidation of shipments is smaller which means less utilization of cargo rebates.

The higher frequency of shipments also causes the billing, handling, shipping and clearance expenses to increase and so does the amount of documentation required. Finally, in the transit system there is no protection against disruption in the subsidiary's line of supply (due to strikes for example).*

C The Multi-Country Warehouse System

As far as storage costs are concerned this system can be categorized as falling between the transit and the classical modes. Such costs are higher than in the transit system since inventories are established in more than one location in the world. On the other hand, by consolidating stocks in one region

*However, this did not seem to represent an excessive problem for most companies using this system, since it is very exceptional not to find any way to supply a subsidiary.

rather than in each country, storage costs are smaller than in the classical system since it reduces the total inventory. There is more potential for consolidation of shipments than in the transit and classical mode for part of the transportation route. However, the transportation costs from the central warehouse to the country of destination, the handling costs (moving merchandise into the warehouse, out of the warehouse) shipping costs, etc. reduce the original savings. There are other problems associated with the maintenance of a multi-country warehouse.

1. Geographical Problem: Some subsidiaries in the area served by the warehouse might benefit more than others. For example, one American company in the sample survey has a central warehouse in Belgium. From there, France, Germany, Holland can be served within 48 hours of an order being received (the time it takes to process the order, get the merchandise on the truck and move the truck). It takes much longer, however, for the merchandise to arrive in Sweden or southern Italy. This is not only because of distances but also because of the documentation requirements, shipment clearances, and other bureaucratic difficulties. So to obtain a given level of service and coverage of the market, some subsidiaries will have to stock more than others. This limits the potential of this system.

2. The Control and Financing of the Inventory in the Central Warehouse: The multi-country warehouse might be controlled by the management of the subsidiary of the country in which it is located. However, that creates some frustration among the other subsidiaries managers. One U.S. company, that set up a central warehouse in Holland, had to send an American executive to manage it because the other countries subsidiaries managers were afraid that in case of excess demand in the European market, the Dutch management (not

directly responsible of the other countries' performance) would not supply them adequately. Another problem connected with the previous one is the financing of the multi-country warehouse inventory. If the warehouse is under the ownership of one subsidiary, the question raised is how much should be charged the other subsidiaries to compensate for inventory holding cost. The solution adopted by some companies is to put the multi-country warehouse under the direct control of headquarters.

D The Direct System

In this system the goods are sent directly from the plant (or the distribution center) of the country where they are manufactured to the customer of the sales subsidiary (it might be the final user, or an intermediary). The main advantage of this system is that the storage costs are smaller than in any other system (the company can concentrate all its inventory in one location). The handling and shipping expenses at subsidiary level are eliminated and so are the transportation costs between subsidiary warehouse and its customers. The company has the choice of billing locally or not,* and will generally decide upon it on the basis of a number of points including terms of taxes, repatriation of profits, etc.

However, the direct system has also serious limitations which will make its use impossible in many cases.

1. Frequency of Shipments: The frequency of shipments from the plant to the foreign market will be maximum. This means that there is less potential for the consolidation of shipments than in any other system. It also means, since each shipment requires documentation, that the manpower time spent at home on paperwork, shipping and handling expenses will be maximum.

*This possibility might be limited by government regulations.

2. Costly Transportation: To obtain a given level of service for which ship transportation could be used in the classical mode, more expensive air transportation will have to be used in the direct mode. And even then, the customer might not receive the merchandise fast enough. In that respect the manager of a company using the direct system for spare parts made these comments: "We keep a central inventory in Colorado and do not keep inventory for spare parts at the subsidiary level. That creates sometimes a problem of major delays. For example - if a customer receives on Monday a product in Norway and finds a defective part, he will notify our local office in Oslo the same day, our central warehouse receives the cable on Tuesday, sends the part on Wednesday and the customer receives it on Thursday - 4 days delay."

3. Customs Clearance: Customs clearance has to be done by the customer. This requires a great deal of customer education and willingness. Sometimes import licences are required for company's product and although sales subsidiaries might acquire a "blanket" import licence (i.e. a licence allowing it to import any quantity of products manufacturing by the parent company). If shipments are made directly to the customer, the client has to secure his own import licence.

4. Quality Control, Labelling, Packaging: Quality control, labelling and packaging have to be made at home which often requires a costly infrastructure in the home company (labels have to be made in the export markets' languages, packages have to be strong enough not to deteriorate during the journey, etc.). Quality control is another problem since in many cases (in pharmaceutical products for example) local government regulations require that the control be made in the country where the goods are sold.

5. Duty: In some countries the duty paid by the customer, if the goods are sent directly, is based on the final price and not on the intra-company

price as in the case of goods transiting through the subsidiary.

6. Interruption in Supply Line: As in the case of the Transit system, there is no protection against interruption of supply due to strikes or any other unforeseen event. The local customer might feel uneasy about buying foreign goods and prefer to shift to another supplier.

7. Manpower and Computer Capacity: The direct system requires enough manpower and computer capacity to deliver to many places straight from the factory. It is, indeed, much simpler to send goods to one customer in one country overseas (the subsidiary) which furthermore is in constant communication with headquarters, than to have an order entry, a monitoring system, and a traffic department assigned to take care of many customers widely spread in foreign countries.

VI FACTORS AFFECTING THE CHOICE OF A SYSTEM

In this section an attempt will be made to delineate what are the main considerations which cause a company to use one system rather than another. Those considerations could be classified into three groups: economic factors, environmental factors, and organizational factors.

A Economic Factors

1. Type of Product: Product characteristics such as value per cubic measure, perishability, and product life cycle, will affect the choice of the mode chosen.

a) Value* per cubic measure. The higher the value of a product, the higher is the cost of tied capital and the more likely it is that a

*The author does not want to enter deeply the argument of what "value" consists of. Suffice is to say that generally speaking in case of excess demand in the market the final price should be considered as representative of "value" since it represents the opportunity cost. While in case of excessive supply only the variable specific costs should be taken into consideration.

company producing it to use a shorter physical distribution system.*

For that reason, in many cases, companies use the direct system with air transportation for their high value low weight products and the classical system for their more bulky products.

b) Perishability: The more perishable a product is, the more likely it is that a shorter system will be used since the product will then be less time in storage, and double handling (which might affect the product's life) is avoided.

c) Product Life Cycle** When a product has a short life cycle it becomes quickly obsolete since new products appear in the market to replace it. A company producing a short life cycle product will then tend to use a shorter system.

2. Proliferation of Products: Although two companies might have the same sales turnover, one company might achieve this volume from a more limited number of product items than the other. When there is a high proliferation of products stock requirements increase geometrically. The savings obtained by concentrating inventories in one place are, therefore, bigger for a company faced with this situation and it is, thus, more likely to use a shorter system.** It should be noted, however, that an exception exists to this rule. When the

*The reader is reminded that the shortest system is the direct system followed by the transit system the longest system being the classical system. The multi-country warehouse system cannot be classified on that basis since it involves some type of association with another system.

**For clarifications on the Product Life Cycle concept see Philip Kotler "Marketing Management" pp. 230-245, Prentice Hall, 1972.

***Even when the proliferation of products is relatively low, the number of parts might be very high and the company then tends to concentrate its spare parts inventory in one world location.

products are not standardized worldwide but are rather specific to each market then multiple stocking is necessary. Safety stocks for a given level of service would not then be reduced by concentrating it in one location, and, a longer system would often be used.

3. Nature of Demand: For high turnover products the potential for consolidation of shipments is very high and it will not generally pay the company to use the direct system. Whether it will use a transit system or a classical system will depend on the other factors mentioned in this section. On the other hand, when the demand is more erratic, the use of direct system or multi-country warehouse is generally recommended. One company surveyed in the sample used the direct system for made-to-order products or those with very erratic demand, a multi-country warehouse in Europe for mild turnover products, the transit system for the high value high turnover products, and the classical system for the high turnover lower valued products.

4. Order Size and Type of Customer: As it was mentioned in the preceding section the direct system put on the subsidiary customer the burden of paperwork and clearance through customs. Not all customers are able or willing to undertake this effort. Furthermore, the opportunity cost for the producing company consisting in sending small orders directly to customers rather than in consolidating shipments is important in terms of documentation required, shipping and transportation expenses. So in general, everything else being equal, companies are less likely to use the direct system for small orders than for large orders. Since the order size is itself connected to the type of customers and channel of distribution policy of the subsidiary, industrial customers are often supplied directly from the country of origin because they are more likely to purchase goods in volume and also because they are generally better

prepared to handle shipment clearance. Government institutions will also often be supplied directly, since in many countries they do not have to pay duties on imported goods. If the sales subsidiary has its own network of intermediaries between itself and the final user, the type of intermediary will affect the choice of the physical distribution system. Two European companies surveyed in the study are using different distribution systems because they made different choices in their channel distribution policy. The first one only selects those big distributors who could buy, clear, and warehouse container size orders, to handle its products. This company is using the direct system. The second company is selling to smaller distributors and directly to retailers. Consequently the warehousing function is handled by the subsidiary and the classical system is used.

B Environment Factors

Included in this section are the main variables upon which a company has little control and which were found important in their effects upon the choice of an international physical distribution system.

1. Level of Customer Service Required in the Market: The market service requirements are a very important factor in the choice of a system. Indeed if for competitive reasons the customers want to get their merchandise on a very quick notice, the company tends to use the classical system unless other factors (like value of goods, for example) make it worthwhile to use air transport (or another fast means of transportation) and a shorter system. This is the reason why one of the companies surveyed was using the classical system for its European markets and the direct system for the south American market where it operated in a quasi-monopoly situation. Another U.S. company has a policy of keeping a warehouse with an inventory for rush orders but sends

goods directly with a discount to the customer, for non-rush orders. High market service requirements might also force the company to design products specific to a certain market needs which as was mentioned in the previous subsection puts a serious obstacle to the use of the direct or transit system.

2. Routing Constraints: On some routes, companies could rapidly supply their customer abroad from their central warehouse by using air transportation, but this is not always the case for all routes. A Swedish company keeps a huge inventory for spare parts in Sydney, Australia while sending spare parts directly from Sweden to British customers. The reason for that is that those spare parts are instant requirements and while it is possible to have them reach the British customer on 24 hours notice, it takes more than 8 days to Australia. "From Stockholm the best flight for that route would be leaving Stockholm at 10 a.m. so we already have lost one day, then there is a transit problem in Bangkok because very often cargo is slow leaving this city in which there are so many passengers. This can take one extra day. When the shipment finally arrives in Sydney, 3 1/2 days have passed. But since the flights arrive in the morning in Sydney we cannot get things out of customs that day. The customs authorities on the spot might delay things. If you take into account the weekend period, the customer cannot receive his spare parts under a week."

3 Host Government Regulations and Actions: Customs requirements and government regulations impose sometimes important constraints on the choice of a physical distribution system. In some countries the government does not recognize a sales subsidiary as an official importer, so only the end user will get an import licence. This means that only the direct system can be used. In other instances only the subsidiary through its "blanket" import

licence can import its goods from the parent company and therefore the imported products will have to transit even for a very short duration through the subsidiaries. Sometimes, in order to reduce the balance of payment's deficit, local regulations do not allow the subsidiary to keep inventories.

In this case the classical system is precluded. Sometimes government regulations require that the quality control be carried out in the buyer's country so there is no way the direct system can be used. This is often true for pharmaceutical products.

4. Cost of Inland Distribution: In some cases the cost of inland distribution is so great that the direct system will be selected. This happens particularly to companies exporting to the United States. A British company which has a warehouse in New York sends directly to its customers on the West coast because it is much cheaper to ship merchandise by boat from London to San Francisco than to ship it to New York and then truck it to the West. (The sales volume on the West coast did not justify the establishment of a regional warehouse.)

C Organizational Factors

In this subsection will be included those factors which are under the control of the company but which affect or limit its choice in its physical distribution system.

1. Other Elements of the Logistics System: Decisions previously or currently made regarding the total system of physical distribution* might limit the company's options in international physical distribution mode design. For example, one company could not use regular airlines to ship its goods because

*The total system of physical distribution includes the following functions: transportation, warehousing, inventory location and plant location, inventory control, materials handling, information flow, packaging, etc.

the cabinetry for its products was 1.5 inches too high. This company had to use exclusively all-cargo air freighters. This forced it to stock much more in foreign warehouses than would have been necessary otherwise. Another U.S. company set up a plant in Boise, Idaho. However, at the time of the study the only type of airplane service that one could get there was a Boeing 727 airplane, not designed to carry cargo. The goods to be shipped to Europe had to be trucked to Seattle airport and flown from there. This again presents problems to those considering using the direct system. Sometimes there is no distribution center for final assembly of components in the U.S. Components have to be assembled by the subsidiary. As was mentioned in the last section, the lack of manpower and computer capacity might also limit the company to use only the transit or classical system.

These are only examples of how other decisions related to physical distribution might constrain the company in its choice of an international system. Sometimes those decisions are made for sound economic reasons. However, many instances of sub-optimization due to a lack of global physical distribution organization were revealed in this study.

2. Cost of Carrying Inventory Charged to the Subsidiary: In almost all the companies surveyed the subsidiaries were considered as profit centers and consequently their management's performance was evaluated on the basis of the subsidiary's profit. However, in many cases the subsidiaries were not fully charged, if at all, for the costs of carrying inventory. This creates a situation in which the subsidiary's management will tend to increase its inventory since this enables him to provide, at little additional cost, a better level of service to its customer, a step which in turn should generate more sales. Under those circumstances it is not surprising that the subsidiaries managers will prefer

and advocate in favour of the classical system,* since if the company used another system it would not be possible for him to continue keeping inventory.

The study revealed that when the subsidiaries had to finance their inventory or were fully charged by their parent company from the moment the goods left the country of origin the attitude changed and inventory was no longer the "most essential thing in the world." The subsidiary management was much more likely to suggest to the headquarters the use of a direct or transit system.

3. Intra-Subsidiary Traffic: When the traffic between different subsidiaries located in different countries is high it is often worthwhile using a multi-country warehouse, since it allows the consolidation of shipments from a manufacturing subsidiary to several sales subsidiaries. In addition, a particular sales subsidiary will be able to obtain consolidated shipments from a few manufacturing subsidiaries.

4. Final Checking at Subsidiary Level: In some cases the direct system for international physical distribution cannot be used because it is necessary for the subsidiaries' employees physically to examine the products before sending them to the customer. For example for some products, shipping alone might cause defects. Consequently there is a need for a quality control step when the goods arrive at the foreign country. In some other cases the direct system cannot be used because packaging and labelling is different in each country and must be made at subsidiary level.

*That does not mean, however, that the global interest of the multinational Corporation will necessarily be best served by doing so.

VII CONCLUSION

This paper has attempted to show that the physical flow of goods to foreign markets does not have to coincide necessarily with the title and promotion flow. Different modes of physical distribution do exist with their relative advantages and drawbacks. Although an attempt was made to delineate under what circumstances each distribution mode is used by multinational corporations, it is clear that decisions regarding the choice of a system should be made ultimately on the basis of their respective cost and revenue implications and the global strategy of the firm.

A constant review of procedures is necessary. Often the only reason for using one system rather than another is resistance to change. This may result not only from a lack of information or the conservative instinct of some firms but may also be inspired by people concerned with protecting their own vested interests.

Physical Distribution costs in multinationals are too important for this function to be neglected. It is the hope of the author to have contributed to a better understanding of the potential of the alternative systems available.

DISTRIBUTION OF SAMPLED FIRMS BY INDUSTRIES

Electronics, Appliances	8
Scientific equipment	3
Office equipment	4
Food	3
Pharmaceuticals and Cosmetics	5
Tools and Industrial equipment	9
Chemicals	3
Sporting Goods	2
Other consumer products	3
	<hr/>
	40

Classical Model's Physical Flow of Merchandise

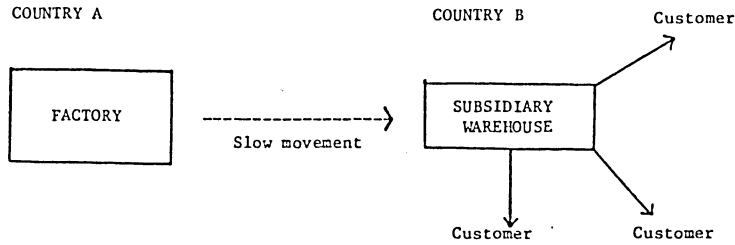


FIGURE I

Transit Model's Physical Flow of Merchandise

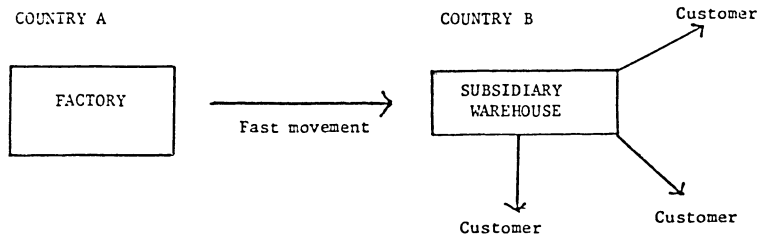


FIGURE II

Direct System

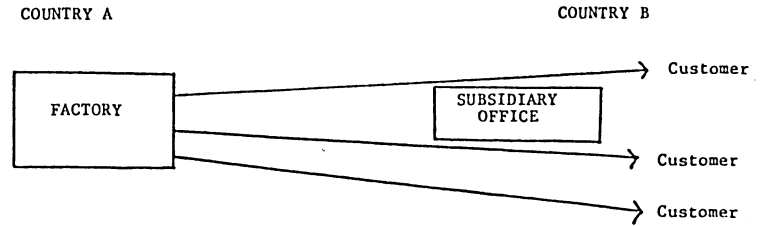


FIGURE III

Multi-Country Warehouse

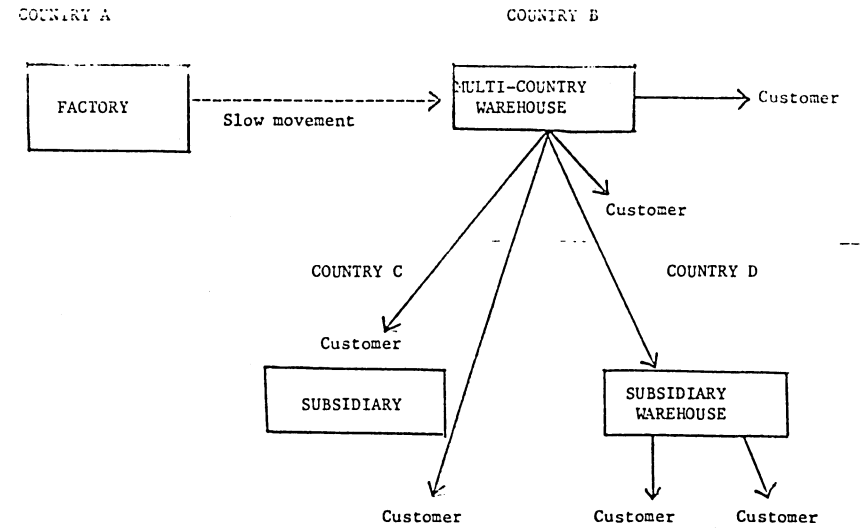


FIGURE IV

REFERENCES

1. McCarthy, Jerome E. and Stanley J. Shapiro, "Basic Marketing," p.41. Irwin Dorsey Ltd., 1979.
2. Lazar, William and Eugene J. Kelley, "Managerial Marketing: Perspective and Viewpoints," p. 413, Richard D. Irwin Inc., 1962.
3. Kotler, Philip, "Marketing Management," p. 304, Prentice Hall, 1972.
4. "Contemporary Physical Distribution," p. 6, by James C. Johnson and Donald F. Wood, P.P.C. Books, 1977.
5. Heskett, James L. "Sweeping Changes in Distribution" Harvard Business Review, March-April, 1973, pp. 123-137.
6. Heskett, James L. "Logistics Essential to Strategy" Harvard Business Review, Nov.-Dec. 1977, pp. 85-96.
7. Heskett, James L., Nicholas A. Glaskowsky Jr. and Robert M. Ivic, "Business Logistics" The Ronald Press Co., 2nd Edition 1973, pp. 232-268.