



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.



3 5556 020 281 747

JOURNAL OF THE TRANSPORTATION RESEARCH FORUM

Volume XXXI Number 2

1991

TRANSPORTATION LIBRARY
SEP 10 1991
NORTHWESTERN UNIVERSITY



TRANSPORTATION RESEARCH FORUM

Generated at University of Minnesota on 2021-11-09 17:51 GMT / <https://hdl.handle.net/2027/ien.35556020281747> / http://www.hathitrust.org/access_use#cc-by-nc-nd-4.0
Creative Commons Attribution-NonCommercial-NoDerivatives /

Assessment of the Ocean Carrier Decision Environment: A Longitudinal Study

by Mary R. Brooks*

ABSTRACT

This paper examines the decision-making process used by Eastern Canadian shippers to evaluate ocean carriers of containerized cargo and discusses whether or not altered competitive conditions in the global marketplace over the past seven years are reflected at the firm level by changes in the terms of sale quoted, in the relative reliance of firms on external parties to assist in or make the carrier selection decision, and in the basic features of the decision-making process. This study is a repeat of part of a much larger investigation conducted in 1982 into carrier selection decisions for container shipments to overseas destinations. (Various aspects of the 1982 study were initially reported in Brooks, Mary R.; 1983, 1984, 1985a, 1985b.) Since 1982, there have been dramatic developments in the industry, particularly in intermodal services and technologies as well as implementation of the Shipping Conferences Exemption Act 1987. The paper focuses on the environment of the carrier selection decision process, leading up to the point at which a shipper has identified his or her options and is now ready to establish the criteria against which different carriers are to be evaluated. It seeks to compare and contrast results from the 1982 study with those found in 1989 to identify any shifts which may have occurred in the decision-making environment at the firm level, as these will influence carrier marketing strategy and its implementation.

The paper concludes that there has been a significant and substantial shift in the decision-making environment. Although the relative usage of various terms of sales has altered, this change is not a significant one. However, the increased reliance of shippers on third parties for carrier selection decision-making is a dramatic one; a greater proportion of firms delegate responsibility for carrier selection to freight forwarders, consignees or third party logistical services. Whereas earlier research found that the majority of carrier selection decisions were made in-house, external parties now choose the carrier for more than one-half of the

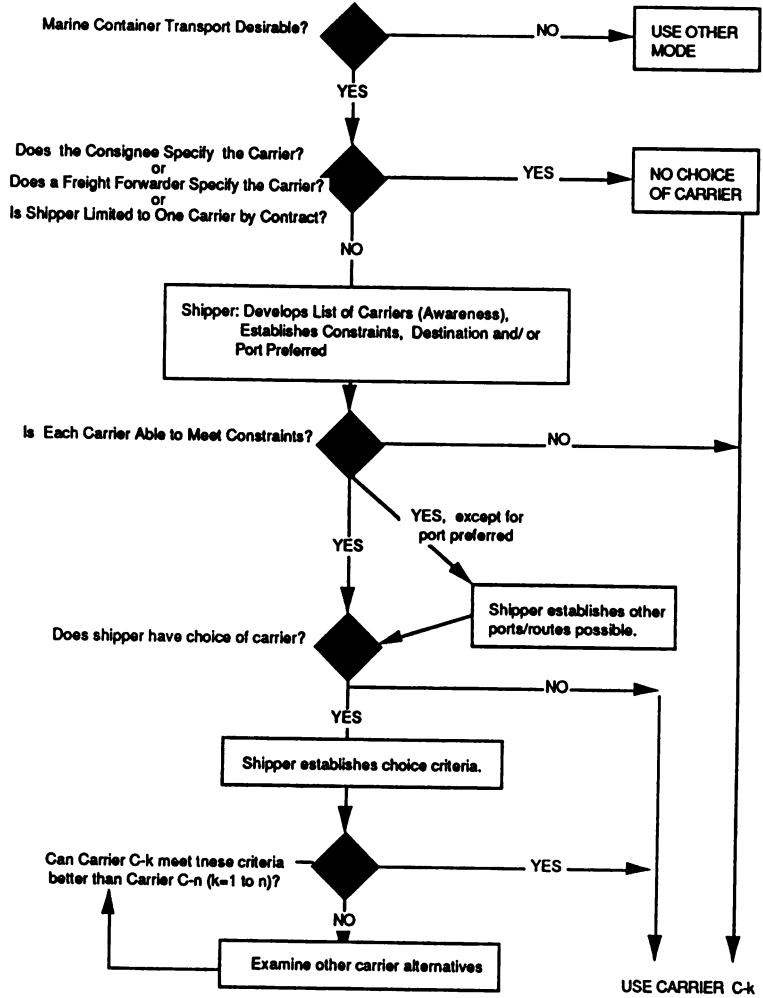
companies surveyed. Furthermore, in those cases where prime responsibility for carrier selection has been retained by the firm, freight forwarders and consignees have a significant influence on the decision taken. As might be expected, such reliance on third parties is not happening solely in small companies; the lack of firm-specific differences between companies allowing third party choice and those retaining control confirms the trend towards of seeking logistics specialists (internal or external) as a means of maintaining a competitive advantage in an increasingly global marketplace.

INTRODUCTION

The study of carrier selection is not new. Prior to the 1982 study, which this study uses as a baseline, a number of carrier selection studies (McGinnis, 1977, 1978, 1979; and Jerman Anderson and Constantin, 1978; for example) had developed models for carrier selection but focused primarily on the criteria used by shippers make carrier selection decisions. Studies like those undertaken by Pearson (1980) and Saleh and LaLonde (1972) looked at the environment in which the purchase decision is made; the importance of Pearson's work lies in its identification of the major constraints facing shippers of container cargo, the target group of this study, while Saleh and LaLonde's study of the U.S. motor carrier industry, in conjunction with Kotler (1980) and Robinson, Faris and Wind (1967), offers assistance in developing a model for this study of the ocean carriage industry. The model, presented in Figure 1, was developed and tested in 1982 and its rationale is detailed in Brooks (1985).

Since 1982, little has changed in carrier selection research. The majority of academic studies still focus on the criteria used in the decision without putting that decision into its situation context; a number of these studies are summarized in McGinnis (1989). Studies by trade associations, such as the Council of Logistics Management (LaLonde and Cooper, 1989) study, make it clear that this topic still being debated; this study of shippers choosing rail and motor carriers focuses mainly on the criteria aspects and context. LaLonde and Cooper note a greater use of contract carriage

FIGURE 1
Carrier Selection Model



Generated at University of Minnesota on 2021-11-09 17:51 GMT / https://hdl.handle.net/2027/ien.35556020281747
 Creative Commons Attribution-NonCommercial-NoDerivatives / http://www.hathitrust.org/access_use#cc-by-nc-nd-4.0

in the U.S. as well as a technology-induced move towards greater co-operation between shippers and carriers. The study presented here looks at the Canadian environment for shippers with overseas container shipments.

Throughout the literature, the absence of focus on the carrier selection environment is surprising. The rise of third party logistical support services, the incursion of freight forwarders acting as NVOCCs into the traditional domain of liner shipping companies, and the advent of double-stack services and growth of landbridges to support the increasing emphasis by the manufacturing sector worldwide on their just-in-time systems in addition to the changing liner regulatory environment in both Canada and the United States all indicate a metamorphosis is taking place in the external environment. But what has happened at the firm level? An update to the 1982 study is presented here to provide some insight into this question.

RESEARCH METHODOLOGY AND SAMPLE DEVELOPMENT

With the decision process illustrated in Figure 1 in mind, a shorter, more focused, version of the 1982 questionnaire was developed to examine any changes in this decision process. Like the 1982 study, the part of the questionnaire examining personnel involved and decision criteria used concentrated on the carrier reassessment decision as opposed to a first-time purchase, as the former is the more common carrier selection decision. (Straight rebuy situations were eliminated as these do not involve a considered reevaluation of the carriers.) Given the number of companies undergoing restructuring, bankruptcy and merger and acquisition activity in Canada in the past decade, a newly selected sample of companies in the same four target provinces - Ontario, Quebec, New Brunswick and Nova Scotia - was taken.

To eliminate all of those shippers exporting only by land to the U.S., it was decided to select only those firms serving non-U.S. markets thereby increasing the likelihood of including those using ocean container transport in the sample. A mailing list of 800 firms with non-U.S. export sales was selected randomly from *Business Opportunities Sourcing System (BOSS) Directory August 1989* as this directory is one of the most complete for firms wishing to be considered for international business opportunities. Numbered companies were eliminated as were those for which no market (destination) information was provided. There was no attempt to include in the new sample any of the companies contacted in the 1982 survey. Standard reply-paid mailing and followup techniques were used.

THE RESPONDENTS

Of the 800 Canadian companies sampled, 430 responses were received, of which 90 companies met the qualifications outlined above. Although many respondents did not indicate why they answered "No" to the qualifying question "Has your company shipped to non-U.S. markets by container this year (1989)?", a significant number elaborated on their answers. Of the 340 companies not qualifying for inclusion in the study, 131 provided the following reasons: for 84 companies, their product was not suited to shipment by container or they had used other modes such as air freight, parcel post, pallet or bulk marine (a few indicated that they used a freight forwarder or sales agent for LCL shipments and could not answer the questionnaire because they knew nothing about their shipments after they left the company) and for the other 47, they did not currently export to non-U.S. markets although they had in the past.

As would be expected, the majority of these firms are located in Ontario (56.7%) and Quebec (30.0%). The Maritime provinces of New Brunswick and Nova Scotia represented 13.3% of the respondents although they only represented 6.7% of the sample population. It is reasonable to expect that respondents will be more receptive to a questionnaire when the source is a local one, and this is not considered sufficient to bias the results.

The respondent companies generally have extensive international exporting experience, on average exporting to 11 different countries, with a full range of foreign destinations. They had diverse shipping requirements with 1988 shipping volumes ranging from one container more than 1000 per year. Although company size ranged from 1-50,000 employees, half of the companies had fewer than 100 employees; the companies contacted included powerful multinationals as well as the very small exporter. The firms were generally well-established with a mean of 16 years of international experience. It is interesting to note, however, that 27% have been exporting to foreign destinations for less than 5 years. Of the total annual sales there was a significant level of non-US export dependency reflected by a mean of 21.2% of total sales. The individuals who completed the questionnaire on behalf of their firms had been performing carrier selection for an average of 7.4 years, and were most likely to be the firm's Export or Traffic Manager, although 18% were either the CEO, President, or General Manager.

STUDY FINDINGS

Terms of Sale - Who Controls The Transport?

As terms of sale are often viewed as a proxy for the location of the carrier selection decision, the study collected data on the pattern of usage of the various terms. The 1982 study contained three categories - F.O.B., C.I.F. and other - while the 1989 study contained four; C.&F. was added because it featured predominantly in the "other" answers in 1982.

Companies do not necessarily rely solely on one type of quotation when developing an export price. In fact in both 1982 and 1989, companies tended to use a variety of terms; the number of companies relying solely on one kind of sale quotation comprise less than a third of the responding companies (see Tables 1 and 2). In the 1982 study, one-half of respondents were relying on C.I.F. terms of sale; by 1989, C.&F. and C.I.F. that is delivered terms, remained popular. But reliance on F.O.B. terms had grown from a mean usage of 36.4% in 1982 to 43.2% in 1989. But was this difference substantial and significant? A t-test on the mean usage of these terms between the two groups indicates that the shift in usage is not a significant one.

Who Controls The Decision?

In 1989 a larger proportion of companies either abdicated or delegated their choice of carrier to either a freight forwarder or the consignee. This was most evident in the diagram illustrating the flow of respondents through the decision process (See Figure 2). In 1982, only 14 of 50 of respondents re-assessing their carrier alternatives did not make the carrier decision for their last shipment in-house while in 1989, 55 of the 90 respondents left control of the carrier selection decision for that shipment to either a freight forwarder, consignee, sales agent or other external party.

It is interesting to note that on all firm-specific factors, such as size of company, years exporting, or years experience making the carrier selection decision, there are no significant differences between the companies which make the decision internally and those which leave the decision to an outside agency or the buyer. Large experienced exporters are just as likely as new small exporters to avail themselves of the expertise of freight forwarders. Conventional wisdom in 1982 held that there were economies of scale in managing transport logistics thereby favoring the existence of in-house traffic managers for large corporations; by 1989, freight forwarders

and third party logistical services have shown large scale exporters that they can be a cost effective alternative to in-house departments. It is not surprising that this study uncovered greater use of freight forwarders; what is surprising is the extent of that use.

The delegation of control becomes even more obvious when we look at the mean share of all carrier selection decisions held by each of the groups available to control carrier selection decisions. By 1989, respondent companies allowed more than one-half of their total carrier selection decisions to be made by freight forwarders and another one-quarter to be made by the consignee. Only 28 percent of all carrier selection decisions were controlled by exporting companies themselves! (See Table 3.) This appears to be a substantial shift from the pattern of allocation of responsibility in 1982. As is further illustrated in Table 4, in 1982, the trend to external carrier selection decision-making is statistically supported; the mean share held by Canadian exporting companies has been significantly reduced and a large number of firms are delegating responsibility to the buyer or an outside agency providing forwarding services.

The relative importance of outside parties to the carrier selection decision has already been indicated. In addition it is very interesting to note that, even when decisions are made within the exporting company, they are often influenced by outsiders. An evaluation of the decision-making unit was also undertaken and it is quite clear from the tally of responses that freight forwarders and consignees are also influencing that internal decision (See Table 5).

Availability of Choices

One of the changes to the environment introduced by the Shipping Conference Exemption Act 1987 was the ability of shippers to negotiate service contracts. One question spotlighted this new element to find that only 3 of 90 companies used service contracts, and only one of these used service contracts for 100% of its shipments. So it does not appear that a significant number of shippers are taking advantage of service contracts and thereby reducing their choices for the advantages inherent in these contracts. This supports the findings of the National Transportation Agency (1989) carrier survey which reports that service contracts have not found favour with Canadian shippers.

Each respondent was asked to go through the process, an option-reducing one, according to the model, and identify the carriers remaining after awareness of alternatives and a number of constraints were taken into account. The constraint most commonly cited

TABLE 1
Terms of Sale 1989

Range	Frequency			
	F.O.B.	C&F	C.I.F.	Other ¹
0%	26	50	35	75
1-19%	13	11	7	3
20-39%	6	6	6	2
40-59%	6	6	6	0
60-79%	2	2	6	1
80-99%	4	1	10	0
100%	25	6	12	1
MEAN (n = 82)	43.2	16.7	36.8	3.3

Note: ¹ Other terms included one company specifying Ex-works and another quoting delivery duty paid.

TABLE 2
Terms of Sale 1982

Range	F.O.B.	C.I.F.	Other ¹
0%	24	13	43
1-19%	11	12	7
20-39%	4	3	4
40-59%	1	3	0
60-79%	3	4	1
80-99%	8	8	4
100%	10	18	2
MEAN (n = 61)	36.4	50.4	13.1
SIGNIFICANCE ²	NS	NS	

Note: ¹ Other included C. & F. in 1982 data collections.
² Mean of 1982 as different from mean of 1989 using t-test.
NS = Not Significant at p. < .05.

FIGURE 2
Flow Diagram For Respondents

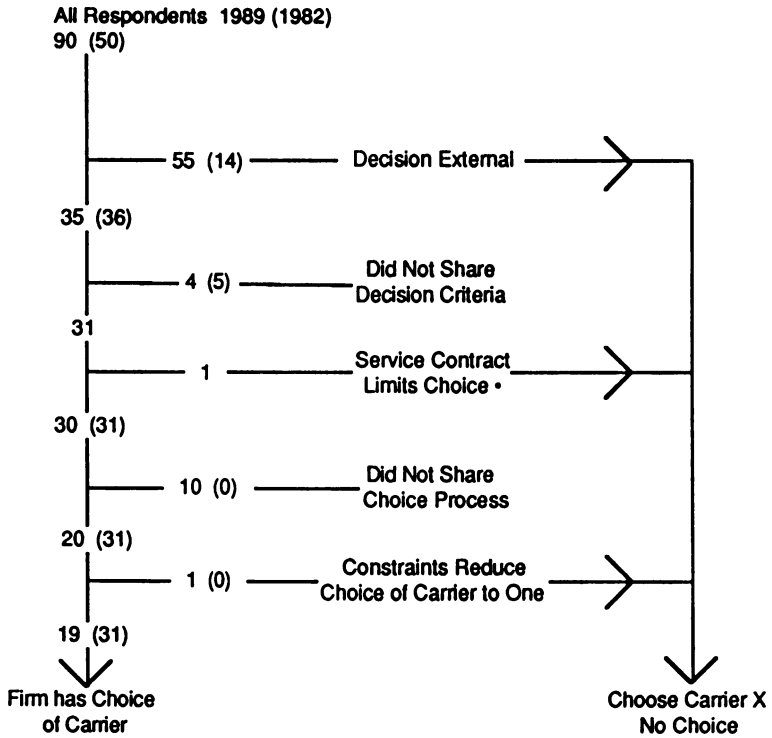


TABLE 3
Location of Decision 1989

Range	Frequency			
	Own Firm	Freight Forwarder	Consignee	Other
0%	47	36	40	77
1-19%	2	4	10	0
20-39%	3	3	8	0
40-59%	10	5	9	0
60-79%	1	4	3	0
80-99%	9	6	1	2
100%	9	23	10	2
MEAN (n = 81)	28.8	42.5	24.2	4.5

Note: ¹ Others specified were conference carrier and proportional usage, sales agent 100%, broker and parent company.

Generated at University of Minnesota on 2021-11-09 17:51 GMT / https://hdl.handle.net/2027/1en.35556020281747 / http://www.hathitrust.org/access_use#cc-by-nc-nd-4.0
 Creative Commons Attribution-NonCommercial-NoDerivatives

TABLE 4
Location of Decision 1982

Range	Frequency			
	Own Firm	Freight Forwarder	Consignee	Other
0%	13	40	39	57
1-19%	3	4	14	2
20-39%	5	2	4	0
40-59%	0	0	0	0
60-79%	3	5	1	0
80-99%	13	4	1	0
100%	24	6	2	2
MEAN (n = 61)	64.0	22.8	9.7	3.5
SIGNIFICANCE ¹	.00	.01	.01	NS

Note: ¹ Mean of 1982 as different from mean of 1989 using the t-test to establish significance. Mean of 1982 as different from mean of 1989 using t-test. NS = Not Significant at p. < .05.

TABLE 5
The Decision-Making Unit In Carrier Reassessment

Roles	Minor Influence ¹	Major Influence ¹
Self	1	29
General Manager	2	1
Production Manager	2	2
Export Manager	3	7
Distribution Manager	2	7
Other	2	7
Freight Forwarder ²	2	6
Consignee ²	3	6
n = 32 ³		
Mean Number of Persons (having either a major or minor influence): 2.18 ⁴		

Note: ¹ Overcounting occurs if one of the job titles also equals 'self'.
² These have some influence but decision still made by firm.
³ Overcounting removed.
⁴ In 1982, the mean was 1.81 persons.

was consignee requirements, while availability of space and equipment played an important role. (See Table 6.) But constraints only resulted in one of the respondents being captive to one carrier.

To elaborate further, of the 34 carriers with an internal choice (55 having delegated their responsibility for choice to either a freight forwarder or a consignee and 1 indicating that 100 percent of 1989 sales were shipped under a service contract), only 19 had a choice of carrier to evaluate on their choice criteria and to rate on performance (and 14 opted not to share their choice process or their decision criteria). Of these 19, 15 had a choice set of two or three carriers. Only one company was captive to one carrier after constraints were taken into account. Most of the 14 companies opting not to share decision criteria or their choice process cited the consignee or a freight forwarder as playing a major role in the decision process; perhaps did not feel comfortable putting words into the mouths of these important outside influences. (see Table 7)

Information Sources Consulted

Where do shippers look for their information now? Has this changed as well? As part of examining the carrier selection environment, it is important to evaluate where companies look for information to make the carrier selection decision and determine whether or not the information sources consulted and relied upon have changed. While significantly more sources are consulted now as opposed to 1982, particular sources - carrier sales representatives and publications like Canadian Sailings and the Journal of Commerce Shipcards - still dominate. (See Table 8).

The 1982 study found that the only significant difference between different purchase situations (new carrier decision versus carrier reassessment) was the time taken to make the decision, with first-time selection decisions taking longer. Although by 1989 the same sources are consulted, the decision is seen to be worth a greater expenditure of effort than was the case several years ago for those firms retaining control. The time companies are taking to make the decision has doubled, in spite of more than one-half of the executives making the decision in less than one day.

CONCLUSIONS

Although this paper has not addressed either the choice criteria used by shippers or the reasons for reassessing carriers, it illustrates that there has been a demonstrable

shift in carrier selection activities in eastern Canada by exporters using containers for their overseas shipments. Most obvious is the increasing reliance by exporters on freight forwarders and consignees to assist, if not make, the carrier selection decision. This dependence is shown not only by an increase in the absolute percentage of selection decisions now made externally, as evidenced by an increase from 14 of 50 shippers in 1982 to 55 of 90 shippers in 1989 relying solely on a outsider, but also by the influence that freight forwarders and consignees are able to exert on the exporting firm personnel. International freight forwarders and third party logistical services have done an admirable job of convincing companies, particularly large scale exporters, of the benefits and cost savings to be had from entering into long-term relationships for the provision of ocean transport services. That shippers also rely on freight forwarders to play a role in internal decision-making is clearly supported.

Of even greater interest is the lack of firm-specific differences between those firms retaining control and those passing it on to an outsider. The most experienced of companies are just as likely to avail themselves of the expertise of outsiders as new small exporters. This should not necessarily be construed as a negative trend. As Canadian companies come under increasing pressure from globally competitive firms and just-in-time production and delivery systems, the need for experienced decision-makers in the area of logistics and distribution will become even more acute. Many companies in the world are turning to third party logistical specialists and freight forwarders as a way of maintaining their competitive advantage. This trend so evident in the U.S. would appear to be well under way in Canada.

REFERENCES

- * Mary R. Brooks is an Associate Professor of International Business at Dalhousie University, Halifax, Canada. She would like to thank Chris Bell and Kirsten Tisdale for their research assistance on this study. She would also like to thank the Centre for International Business Studies for their generous support of this research project, both in 1982 and 1989. She would also like to thank Douglas Rosenthal of the Halifax International Trade Centre for his assistance.

American Shipper, July 1989, pp. 50, 52.
Brooks, Mary R., *An Alternative Theoretical Approach to the Evaluation of Liner Shipping*,

TABLE 6
Constraints On Choice

	Frequency	
	1989	1982
No Suitable Box	7	7
Conference Policy	1	9
Non-Conference Policy	2	1
Consignee Requirements	11	11
LCL Requirements	2	2
No Space	7	3
	n=24	n=24

Note: Respondents were asked to check all that apply.

TABLE 7
Number of Carriers In Choice Set

Options	Number of Respondents	
	1989	1982
Only one carrier	1	0
Two choices remaining	6	7
Three choices remaining	9	12
Four choices remaining	0	3
Five choices remaining	3	3
Six or more choices	1	6
TOTAL	20	31

TABLE 8
Information Sources Used In Reassessment

Source	Respondents Consulting ¹	
	1989	1982
Federal Government Agency	0%	3.1%
Provincial Government Agency	29.0%	0%
Other Government Agencies	0%	7.9%
Carrier Sales Representative	60.0%	78.1%
Advertising, Direct Mail	25.7%	34.4%
Internal Records	31.7%	31.2%
Traffic Club	11.4%	9.4%
Other Executives within Firm	5.7%	6.2%
Brokerage House, Investment Counsellor	0%	3.1%
Yellow Pages	14.3%	3.1%
<i>Canadian Sailings, Shipcards</i> ²	48.6%	54.7%
Trade Displays at Conferences	0%	0%
Newspapers, Magazines (Articles not advertisements)	5.7%	21.9%
Other Executives outside Firm	8.6%	4.7%
Mean number of sources consulted	5.93	3.05

Note: ¹ Respondents were asked to check all that applied.
² In 1982, the publications used were *Marine News* and the sailing schedules published in *Globe & Mail*.

Part I. Situational factors. Maritime Policy and Management, Vol. 11, No. 1, 1984, pp. 35-43.

Brooks, Mary R., An Alternative Theoretical Approach to the Evaluation of Liner Shipping, Part II. Choice Criteria, *Maritime Policy and Management*, Vol. 12, No. 2, 1985, pp.145-155.

Brooks, Mary R. An Assessment of Carrier Marketing Strategies Through Exporter Survey, Canadian Transportation Research Forum *Proceedings*, Regina, 1983, pp. 21/1-17.

Brooks, Mary R. Limitations in the Carrier Choice Process, *International Journal of Physical Distribution and Materials Management*, Vol. 15, No. 3, 1985, pp. 38-46.

Jerman, R.E., Anderson, R.D., and Constantine, J.A., Shipper Versus Carrier Perceptions of Carrier Selection Variables, *International Journal of Physical Distribution and Materials Management*, Vol. 9, No. 1, 1978, pp. 29-38.

Kotler, P., *Principles of Marketing* (Prentice Hall Inc., Englewood Cliffs NJ, 1980).

LaLonde, B.J., and Cooper, M.C., *Partnerships in Providing Customer Service: A Third Party Perspective* (Council of Logistics Management, 1989).

National Transportation Agency, *Annual Review 1989*.

McGinnis, M.A. *A Study of Freight Transportation Choice*, D.B.A. Dissertation: University of Maryland, 1977.

McGinnis, M.A., Segmenting Freight Markets, *Transportation Journal*, Vol. 18 (Fall), 1978, pp. 58-68.

McGinnis, M. A., Shipper Attitudes Towards Freight Transport Choice: A Factor Analytical Study, *International Journal of Physical Distribution and Materials Management*, Vol. 10, No. 1, 1979, pp. 25-34.

McGinnis, M. A., A Comparative Evaluation of Freight Transportation Choice Models.

Transportation Journal, Winter 1989, pp. 36-46.

Pearson, R., *Containerline Performance and Service Quality*, (University of Liverpool: Marine Transport Centre, Liverpool, 1980).

Robinson, P.J., Faris, C.W and Wind, Y., *Industrial Buying and Creative Marketing* (Allyn Bacon Inc., Boston MA, 1967).

Saleh, F. and LaLonde B.J., Industrial Buying Behaviour and the Motor Carrier Selection Decision. *Journal of Purchasing*, Vol. 8, No.1, 1972, pp. 18-33.

Stock, J.R., How Shippers Judge Carriers. *Distribution Worldwide*, August, 1976, pp. 32-35.

Stock, J.R. and LaLonde, B.J., The Purchasing Approach to Transportation Mode Selection. *Journal of Purchasing and Materials Management*, Spring 1978, pp. 2-5.