



AN EMPIRICAL STUDY OF FACTORS INFLUENCING OUTSOURCING OF SUPPLY CHAIN LOGISTICS

Shashwat Malhotra

School of business studies and social sciences, Christ University

&

Sahil Kalra

School of business studies and social sciences, Christ University

Introduction

As Europe opens access to its transport sector with fewer barriers to cross-Continent movement and as North America itself presents prospects for a more unified trading bloc, it is useful to assess the role of international logistics within multinational manufacturing and merchandising companies. Leading companies have already recognized opportunities for efficiency through global sourcing and manufacturing and for increased market share and revenues via entry into overseas markets. Global distribution, while more complex, has become a necessary logistics function for many other companies. Not surprisingly, these trends have created both issues and opportunities for logistics service providers.

Today many internationally focused logistics service providers, including freight forwarders, customhouse brokers, ocean and air carriers, as well as logistics management companies, characterize themselves as

third-party logistics providers capable of offering bundled services for the movement of international freight. The degree to which such offerings may be employed by major importing

and exporting firms depends on several factors influencing the economies and utility of those services. A better understanding of these factors and the underlying drivers is the main objective of this article.

This study examined the attitudes of shippers and service providers towards outsourcing of logistics functions performed within large multinational, manufacturing companies engaged in global trade. Based on case studies. First, the study was conducted from a US perspective, Second, the study focused primarily on the North Atlantic trade; Third, the study focused on the ocean and surface modes

Methodology and Data

This article was originally motivated by the interest of a carrier in exploring the market for new third-party services between the US and Europe across the North Atlantic lanes utilizing ocean and surface modes (i.e. excluding air services).

Based on secondary data shippers were asked about the services offered by international logistics third parties falling into the following major classes:

- planning;
- administrative;
- equipment related;
- handling;
- pre- or post-production;
- warehousing;
- transportation;
- terminal related;

Not all products require this full set of global logistics functions. For example, some products may not require the pre- or post-production activities. However, high value-added items such as auto parts might undergo sequencing activities for just-in-time assembly. Specialty chemicals

might require a logistics system consisting of forward distribution centers where some value-added services are performed. Many consumer goods imported from abroad might undergo post-production marking and labelling closer to points of consumption.

What concerns do shippers have and what issues do service providers face in the outsourcing decision for these functions. There were many such expressions and they could be grouped under five major factors. In other words, five key factors emerge as interacting drivers in the decision of shippers to either utilize third parties or retain in-house capabilities to execute logistics international functions:

- (1) centrality of the logistics functions to core competency;
- (2) risk liability and control;
- (3) operating cost/service tradeoffs;
- (4) information and communications systems;
- (5) market relationships.

When some shippers indicated that their attitudes towards outsourcing were heavily influenced by their concern for protecting the in-house

underlying implication was that such knowledge and expertise was intrinsic to the central mission of the organization, i.e. it was perceived as a core capability. Some shippers expressed the same underlying factor differently: that they would lose control of the supply chain or that they did not want to be “locked-in to few service providers”. Other shippers expressed an opposite point of view, but still relating to the same underlying factor: they “did not want to manage details”, indicating that they would rather manage relationships with a single source or a select few vendors so that they could devote the bulk of their management energy to “focusing on core activities”.

Each of the five factors are more fully discussed, The distribution of responses in the case studies concerning these factors. It is perhaps not surprising that certain issues dominate the chart, such as cost/service issues and the strategic question of how central or critical the international logistics functions are to the core capabilities of the firm.

As observed these factors can create favourable or unfavourable climates for the logistics outsourcing.

Classification of international logistics functions

Planning functions

- Location selection, Supplier selection, Supplier contracting, Scheduling

Equipment functions

- Selection Allocation, Sequencing Positioning, Inventory control, Ordering Repair

Terminal functions

- Gate checks, Location control

Handling functions

- Pick-up, Consolidation, Distribution, Expediting, Diversion, Transloading

Administrative functions

- Order management, Document preparation, Customs clearance, Invoicing Inventory management Performance evaluation, Information services Communications

Warehousing functions

- Receiving, Inventory control, Reshipment, Marking

Transportation functions

- Tracking and tracing

Centrality of the Logistics Functions In evaluating the use of outsourcing, one of the primary concerns is that the internal staffing for logistical activities detracts from the core competency of the firm. Conversely, an outside firm whose own core competency is that of arranging for international transactions may be the preferable alternative for achieving success as a shipper.

The issue revolves around which of the international logistics functions are central to the core competency of the firm. As a starting point, most of the planning and administrative functions are usually integral to the core activities and cannot be separated easily. The remaining functions

are important, but whether they are central and critical to the organization's core mission depends on the complexity and structure of its products, processes and network. These "drivers" are discussed further in the next section since they also affect some of the other four key factors. These drivers affect the difficulty of co-ordinating material and information flows under various task environments faced by a firm.

Risk Liability and Control The laws clearly state that responsibility for the safe storage and handling of hazardous materials may not be reduced because of the existence of an agency relationship or because of the passing of title or possession in the supply chain. Therefore, firms may prefer to ensure conformance to prescribed standards via proprietary policies and controls. This was the case with a few firms in the study who expressed a willingness to outsource most logistics activities but wanted to retain those activities in-house when hazardous materials or other controlled items (such as pharmaceutical or defence-related goods) are involved. Use of the risk liability argument sometimes also reflected lack of adequate information concerning service options and availability as well as uncertain strategy whether the firm should continue to make capital investments in proprietary facilities, equipment and other assets.

Only one firm used as justification against outsourcing, the argument that carriers and third parties would be unable to provide the extraordinarily superior service which some of the consignees demand and that the failure to do so results in a loss of good will which is an insurmountable cost. The predominant view was that handling requirements can be built into the service designs and that service providers can fulfil these expectations. Continuous monitoring and measurement of performance become important considerations and contracts can stipulate substantial penalties for nonperformance.

Operating Cost/Service Tradeoffs Critical to maintaining in-house capability in any activity, logistics or otherwise, is whether it provides cost-effective service at a quality level competitive in the marketplace. Expressions by shippers of the need for consistent Favorable climate for outsourcing.

service, the pressures of downsizing, and opportunities for cost savings via facility consolidation, especially in Europe where border barriers are being reduced, reflected the cost/service dynamics.

Service providers also reflected on cost/service issues in various ways including increased opportunities for use of their transportation, warehousing or consolidation facilities due to the changes in Europe. Terminal operators, for example, are making new investments at strategic locations to take advantage of what they see as increased outsourcing opportunities as shippers reduce the number of their own warehouses, reallocate their own capital and look for assistance in exploring new markets in Central and Eastern Europe.

Another factor affecting the cost/service equation is specialization by some service providers. For example, freight forwarders now carve specific niches such as chemical or the consumer goods industries. This specialization allows third parties to provide customized services at same or lower cost.

Information and Communications Systems Shippers naturally look to carriers to address problems associated with the global pipeline through such features as shipment tracking systems, booking systems and electronic data interchange (EDI). Most carriers have supplemented physical goods movement with information systems with the intent that these not only facilitate management of their own businesses but also add value to the shippers. However, international logistics is sufficiently different from domestic logistics in the complexity of its transactions to preclude their being managed with existing domestic systems.

Import/export software also has not been readily commercially available, precluding easy integration and bundling with other software. The very complexity of booking, cross-border tracking and other transactions and the global reach of the logistics processes increases the cost of building the necessary telecommunication and information systems.

Further compounding the problem, EDI systems have developed independently in the various trading blocs, with Europe adopting the Electronic Data Interchange for Administration, Commerce and Transportation (EDIFACT) standards; the US, those of the American National Standards Institute. International firms seeking to participate in the technology had to adopt EDIFACT or establish a private format between trading partners. Further compounding the problem, international logistics usually entails several modes and several carriers, making seamless EDI throughout the transportation pipeline difficult.

These difficulties in the global supply chain have provided an opening to other third-party service providers to enter the market. Outsourcing of selected information and other

administrative functions may, therefore, provide an attractive alternative to shippers over incurring the expense of modifying existing, or creating new systems. Premium forwarders, such as Danzas, Fritz Companies and Harper Group, have begun to capitalize on this gap in the supply chain, believing it to provide a distinct competitive advantage.

Some large shippers with extensive manufacturing facilities worldwide, such as automotive companies, have made similar investments in telecommunication and information systems which they obviously want to continue to use. These shippers continue to retain much of the administrative functions in-house or in some cases they may outsource some functions but require their logistics service providers to feed requisite data into their proprietary systems.

Market Relationships The nature of the relationship between shippers and service providers is obviously critical to the single sourcing or outsourcing decision. This factor addresses the market relationships between logistics service providers on the one hand and shippers on the other. Note that the definition of shippers here could include affiliates within the same parent company or two distinct companies for the consignor and consignee.

As third parties expand the scope of their services, particularly through administrative and pre- or postproduction services, the potential exists for their ties to change from being merely transactional to becoming relational. Indeed, shippers already utilizing these services, primarily through forwarders, are convinced that these relationships have had a substantial bearing on their past success and they remain strongly committed to maintaining them.

What is the value to shippers of these relationships, beyond the cost/service tradeoffs? The study revealed that the service providers were a source of market intelligence to the shippers in a variety of ways: learning about sourcing alternatives in far-off places; options about volumes, specific commodities, and origins and destinations. Others cited the importance of obtaining financial condition information about other service providers, especially carriers. Access to a multitude of interpersonal networks can also be a valuable asset when entering new international markets, operating in areas with cultural, financial or political barriers, or in seeking new business partners. Some service providers have become extensions of their shippers' operations or receivers (customers) to monitor the supply chain, undertake corrective actions, provide feedback to shippers, and react to changes in the marketplace. The usefulness of these services

for shippers obviously depends on how well the internal logistics organization is staffed and how central these functions are to the core activities of the firm.

A related issue is the cost of managing relationships with a multiplicity of logistics service suppliers. This cost is manifested in two ways: internal organization costs, and the potential loss of leverage when too many suppliers cause loss of sufficient critical mass for achieving economies of scale in the marketplace. This issue seems to have been resolved in different ways on the two continents. The European shippers were prompt to state that their relationships with service providers typically have endured over long periods, as opposed to the US where several shippers indicated that they pursue a practice of soliciting bids for many services on an annual basis. Hence market relationships could also be correlated with how firms approach and resolve cost/service tradeoffs.

Drivers in the Key Factors Model: Logistics Complexity Although the preceding discussion sheds some light on why favourable climates for outsourcing decisions are created, it does not explain how the factors themselves are influenced. The case studies suggested that several characteristics of a shipper's business profile serve as latent influences on these factors. A convenient way to summarize the collective impact of these characteristics is the notion of "logistics complexity".

The notion of complexity is certainly not new, arising in a variety of settings. In international logistics, the complexity is due principally to:

(1) the large volume and variety of logistics transactions, impacting both physical and information tasks; (2) divergence in the number and sequence of transactions which must be performed for the various products moving in different regions of the world – exporting electronic products to a southern hemisphere nation requires different transaction permutations from importing textile products from the Far East;

(3) interdependency (positive and negative feedbacks) of tasks within the supply chain process, which places a premium on co-ordination and control.

The focus on niche markets by some providers can be explained as an attempt to limit the amount of complexity they must deal with in serving their customers.

The firm, product and management profile data from shippers also fostered the notion that the complexity of international logistics operations can vary significantly among firms as a result of the products they make, the processes they employ, the areas in which they trade and the financial/business strategies they pursue.

Network Complexity Network complexity refers to both the geographic dispersion of a firm's trading partners as well as the intensiveness of transactions with selected trading partners which can give rise to volume leveraging effects. Specific variables contributing to network complexity include:

- number of supplying and distribution trading partners;
- number of countries involved in the supply chain;
- number of continents (or regions) involved in the supply chain;
- stock-keeping unit (SKU) and origin/destination (OD) pair permutations.

A large number of trading partners implies many more logistics transactions which must be managed. The difficulty of this management depends partly on the specific countries and continents involved. Regions of the world where the transportation and telecommunication infrastructure are less well developed will obviously increase the management difficulty, driving some firms to outsource selected logistics functions to third-party service providers.

The nature of the traffic dispersion in the network is also important to note. One way to capture this aspect is by examining the permutation of SKU's and OD pairs (measured in terms of world's regions). The network is most complex when all the firm's products are moved among all the trading partners who are located in all major regions of the world.

Network complexity is likely to strongly influence both the cost/service tradeoffs and need for information technology capability as well as the market relationships factors. In other words, both the quantifiable cost/service aspects as well as the less intangible values from market relationships with service providers are affected by how complex shippers networks are in terms of number and location of trading partners.

Process Complexity This driver refers to time and task compression (or lack thereof) in the supply chain. When the logistics process is complicated by the number of tasks which have to be

performed and co-ordinated within a short span of time, such as in JIT environments, numerous cost/service tradeoffs and functional interdependency arise in operations. Key variables useful in measuring this driver include:

- time sensitivity of transactions within the supply chain;
- manufacturing cycle times for components and products;
- order cycle times for customer orders.

Time sensitivity used in this context is a measure of the relative importance of one set of transactions being performed within narrow tolerances or sequenced with another set of transactions; for instance, materials inbound to meet other materials in an assembly process, or the movement of highly perishable goods. In either case, significant costs could be incurred through performance failures. Manufacturing and order cycle times are also important. Long cycle times suggest considerable process complexity. There may then be opportunities for reducing cycle times by re-engineering processes or outsourcing some process components. The ability to simplify processes or to manage complex processes well could be a core competency of the firm. Product Complexity This driver refers to the special circumstances required by products and materials due to the complexity of the

environment (temperature, humidity, etc.) governing their transportation, storage and handling. Hazardous materials, goods with short shelf lives or that are susceptible to damage, and other physical properties make logistics more difficult in international trade.

In addition to the above three drivers, a firm's business growth strategies and financial capabilities can also influence logistics strategies. Explicit business strategy, to develop core capabilities or discard business segments or functions, can obviously influence the role of the logistics functions in the sourcing, manufacturing, and distribution activities. The degree to which markets are expanding or shrinking also has a direct influence on the ability of the firm to assimilate change. The firm's fiscal ability to make investments in manufacturing and logistics facilities (warehouses, forward distribution centres, etc.) and in information technology and telecommunications can also expand or limit its logistics options set.

Summary and Conclusions

The logistics outsourcing decision is not easy to characterize because there are many functions which fall under the term “logistics”. A firm may outsource none, some, or many of these functions. This study indicates that five key factors influence this decision:

- (1) centrality of the logistics functions to the firm’s core competency;
- (2) risk liability and control;
- (3) cost/service tradeoffs in operations;
- (4) information and communications systems;
- (5) market relationships.

The research also suggests that the above factors are influenced by drivers: sets of variables from a firm’s operating profile. The key drivers are:

- network complexity;
- process complexity;
- product complexity.

Additional research is needed to further define these drivers and better capture the nature of their influence.

Finally, the logistics outsourcing decision does not take place in a vacuum or is independent of broader financial and strategic thrust of the firm. The global supply chain firmly bonds logistics functions to the other activities in the firm. Figuring out which of these functions can be successfully performed through partnerships with logistics service providers will be a continuing challenge for logistics executives. This research will have hopefully provided some clarifications on this topic.

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Biography of Authors

Authors:

Shashwat Malhotra

Bio: Shashwat Malhotra (born 20thFebruary , 1997) is a student in Christ University's Class of 2018. He is currently pursuing a Bachelor's degree in Business Administration with majors in Finance and International Business. Being an avid fester, he has participated in and event headed Various national level university business fests. His main interests lie in International Business, Economics and Marketing.

Address: E4- 702, Snn Raj Serenity, Bangalore- 560068

Sahil Kalra

Bio: Sahil Kalra (born 23rdJune , 1997) is a student in Christ University's Class of 2018. He is currently pursuing a Bachelor's degree in Business Administration with majors in Finance and International Business. His main interests lie in Banking and International Business.

Address: E4- 702, Snn Raj Serenity, Bangalore- 560068