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Global Supply Chains: Factors Influencing Outsourcing of Logistics Functions

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Studies shippers' and service providers' attitudes towards outsourcing of logistics functions in multinational companies.

Global Supply Chains:

Factors Influencing Outsourcing of Logistics Functions

Kant Rao and Richard R. Young

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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, a conceptual model is presented indicating the factors which influence outsourcing or single sourcing decisions[1].

Three caveats should be noted at the outset. First, the study was conducted from a US perspective although shippers and service providers on both continents were included in the study. Second, the study focused primarily on the North Atlantic trade; while many of the shippers and service providers interviewed also participate in the Asian and other markets, questions pertaining to outsourcing emphasized the transatlantic lanes. Third, the study focused on the ocean and surface modes; air freight was not addressed.

Background

The use of single sourcing and outsourcing to third-party logistics firms, or contract logistics as some prefer, is a noteworthy phenomenon even domestically in the US. Lieb's[2] survey indicated that about one-third of large manufacturing companies in the US use third-party logistics services and over 60 per cent of these firms have utilized these services for more than five years. The three most widely outsourced services were warehousing, shipment consolidation, and selected logistics information systems. All three activities are important in the context of international logistics as well and our study indicates that, due to its critical role, information systems can also influence the outsourcing decision itself.

Crum *et al.*[3] found the trend towards growing partnerships between shippers and carriers to be a threat for third-party companies. Another potential problem for third parties is that many shippers believe that their own departments provide more cost-effective service. Both these issues garnered some support in the present study.

Murphy *et al.*'s[4] study confirmed that nearly all large multinational companies tend to make use of third-party logistics providers, although no mention was made of the services being utilized. Traditionally, certain documentation (e.g. customs clearance or duty drawback) and less-than-containerload (LCL) shipment consolida-

tion functions have been outsourced by many shippers to freight forwarders and other intermediaries. However, there is growing pressure towards single-stop services. Fawcett and Birou[5] found that shippers look favourably on carriers who have the ability to pre-clear customs, provide a single, through bill of lading and handle all documentation.

Consolidation of services in the logistics market is confirmed also by many recent trends. Several major truckload and less-than-truckload (LTL) companies have entered the third party logistics arena, specifically designing and managing integrated logistics systems through either formation of new subsidiaries, strategic partnering or acquisition. Several truckload companies have formed intermodal partnerships with railroads thereby invading the former turf of intermodal retail marketing companies. Some LTL companies have also formed logistics subsidiaries and created alliances with European logistics companies to provide international door-to-door service for LCL shippers.

In summary, all forms of logistics service providers are expanding their range of offerings in response to market demand and competition. International logistics, having the potential for being more fragmented and diverse than domestic, will offer more complex opportunities. Indeed, seamless performance in the global environment is far from reality. As a result, both shippers and service providers are striving for improvements via such strategies as outsourcing, formation of alliances and investment in information and telecommunication systems.

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). The research employed a case study approach, through personal interviews with 44 firms engaged in import-export, either as shippers, international forwarders, carriers, non-vessel-owning common carriers (NVOCCs), port authorities, terminal operators, or information and/or telecommunication providers. A structured guide was used to initiate the interview through the meetings which typically lasted two to four hours. The meetings which were generally held with the senior transportation (in the case of shippers) or operations (with the rest) executives were subsequently followed by phone conversations to fill missing information. As a result, much more in-depth information was obtained than possible through mail-in surveys.

Firms in the study consisted of 15 global, *Fortune* 500 shippers, 21 carriers and forwarders, and eight providers

of other “infrastructure” services (port facilities, telecommunication and information systems). Twenty-one organizations were headquartered in the US while 23 were based in Europe. Table I provides additional details concerning the composition of the firms in the case studies.

For the shippers, information was sought on the industry characteristics of the respondent firm, a profile of the firm and the nature of its international trading partners. The survey guide included questions concerning carriers, forwarders and customhouse brokers used in major transatlantic lanes for key products. Each shipper was also asked to state whether they, their trading partner, or a third-party logistics provider typically performed 13 different tasks ranging from carrier rate negotiation and carrier performance evaluation to more transaction-oriented activities such as warehousing, inventory management and consolidation/deconsolidation services. Shippers’ attitudes towards the use of door-to-door transportation providers, and factors they considered important in current or potential future debate concerning outsourcing, were also explored. Information concerning the role of the trading partner in these decisions was also obtained.

For the logistics service providers, the interviews focused on their capabilities, services offered, service tie-ins with other logistics firms (i.e. alliances) and major customers. If the service provider had sophisticated information systems in such areas as shipment tracking, EDI, import documentation monitors, complex duty calculations, etc. they were queried further. The service providers’ views regarding factors important in shippers’ selection of logistics service vendors were also sought.

Table I. *Interviewed Firms by Type*

	US	Europe	Total
<i>Shippers</i>	10	5	15
Automobile			1
Chemicals			6
Consumer goods			2
Food products			2
Electronic			2
Metals			2
<i>Carriers and organizers</i>	8	13	21
Carriers			6
Forwarders/third parties			15
<i>Infrastructure/information</i>	3	5	8
Port operators			5
Information/telecommunications			3

In this article, presentation of the raw data is avoided, both because of the volume and because some data are of a proprietary nature. Instead, the article focuses on developing a conceptual model based on the case studies focusing on two aspects: first, the key factors influencing shippers' outsourcing behaviour; and second, some of the underlying characteristics of logistics complexity which "drive" this behaviour.

Key Factors Interaction Model

In the case studies, 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.

Specific functions within each of the above categories are shown in Table II. 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 centres 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 as shown in Table III. 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.

Most of the expressions found in Table III can be readily grouped under the five key factors, while others may require some explanation. When some shippers indicated that their attitudes towards outsourcing were heavily influenced by their concern for protecting the in-house

Table II. *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

Pre/post-production

Sequencing
Assorting
Packaging
Postponement[6]
Marking

Transportation functions

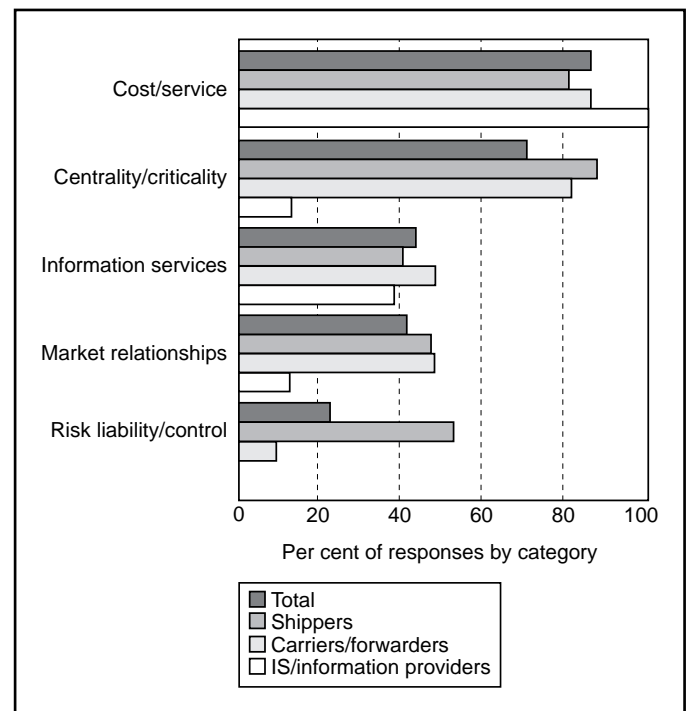
Modal co-ordination
Linehaul services
Tracking and tracing

Table III. *Expression of Key Factors*

<i>About centrality/criticality of functions</i>	
●	Protecting in-house expertise
●	Cross-border production management critical
●	Control of supply chain
●	Fear of “lock-in” to few service providers
●	“We don’t want to manage details”
●	Focus on core activities
<i>About risk liability and control</i>	
●	Assurance of quality
●	Uncertain strategy regarding control
<i>About cost/service issues</i>	
●	Consistent service
●	Corporate downsizing
●	Reallocation of capital
●	Facility consolidations (especially in Europe)
●	Cost/service tradeoffs
<i>About information/telecommunication services</i>	
●	Complexity of transactions and processes
●	Compatible technology
<i>About market relationships</i>	
●	Transactional
●	Value-added
●	Strategic
●	“Avoid multiple vendors”
●	“Protect existing relationships”

expertise which had been developed over time; the 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 below. The distribution of responses in the case studies concerning these factors is shown in Figure 1. 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.

Figure 1. *Distribution of Key Outsourcing Factors*

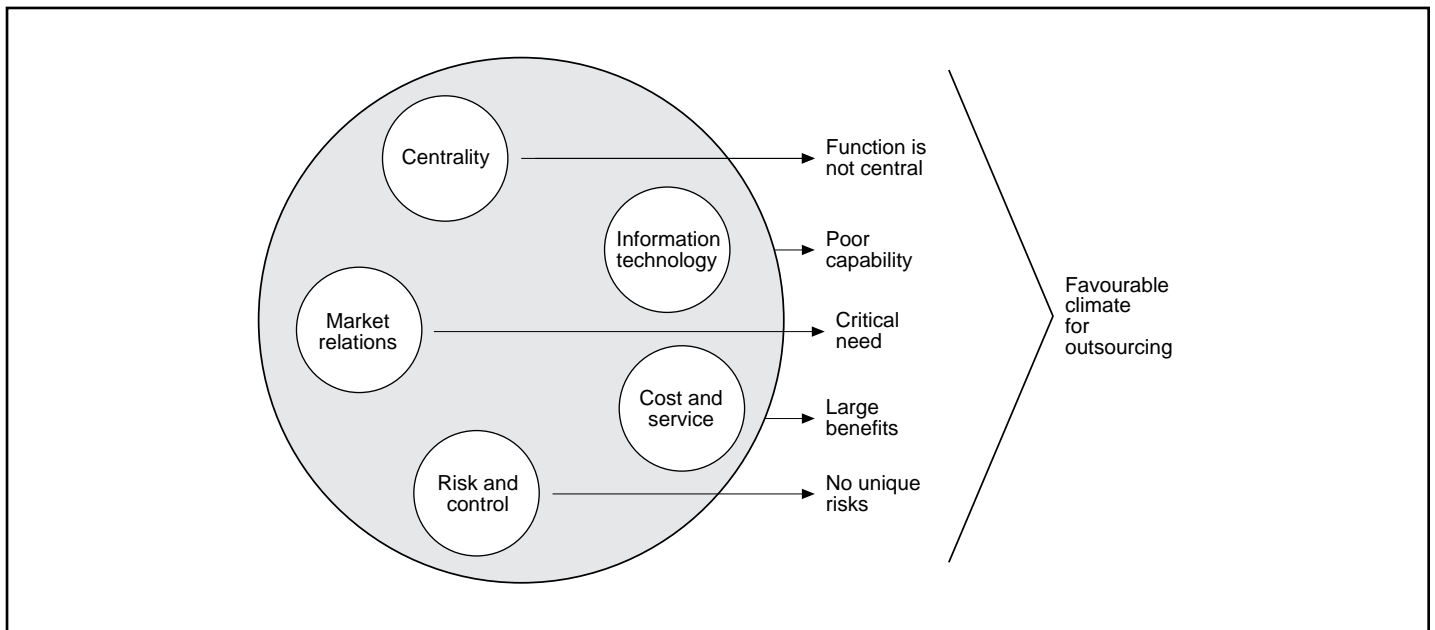
Also of interest is the pervasiveness of the information/telecommunication systems' issue across all respondents.

As depicted in Figure 2, these factors can create favourable or unfavourable climates for the logistics outsourcing. The factors are described first and then, in the following section, drivers underlying these factors are discussed.

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 in Table II 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.

Figure 2. *Key Factors Influencing Outsourcing of International Logistics Functions*

Where these environments are not perceived as being particularly unique, shippers might conclude that there is no inherent reason why (at least some) logistics functions could not be outsourced in the same way that manufacturing and even some of the sales functions are sometimes externally procured by global firms. In other cases, for some firms, particular initiatives underway might be overriding considerations. For example, some respondents cited the increased use of cross-border sourcing, production and distribution as requiring internally new logistics processes resulting in new demands on the logistics organization. Depending on the organization's outlook regarding staff expansion or contraction, and the centrality or criticality of such processes to the core activities of the firm, the situation could present an opportunity for logistics outsourcing.

As firms engage in make-or-buy decisions, the issue of downsizing confronts many traditional logistically-related activities. International shipping is an activity known for its inherent complexity. Where shipping volumes are small (say in a newly entered region of the world), the pressures for downsizing have created an incentive to outsource at least some logistics activities. In other cases, however, the internal import-export groups within shipper firms have sought to defend their existence due to the complexity of and the need for control of international shipments. Whether this tactic will be successful in the long run or not depends on the other four factors and their drivers described next.

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 non-performance.

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

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[7].

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 in particular, 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[8].

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[9].

As third parties expand the scope of their services, particularly through administrative and pre- or post-production services, the potential exists for their ties to change from being merely transactional to becoming relational[10]. 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: for example, interacting closely with the shippers' suppliers

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. Thus the nature of the relationship between shippers and service providers could be correlated with the centrality key factor and possibly other factors as mentioned below.

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.

These three sources of complexity were evident in discussions with both shippers and logistics service providers. 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:

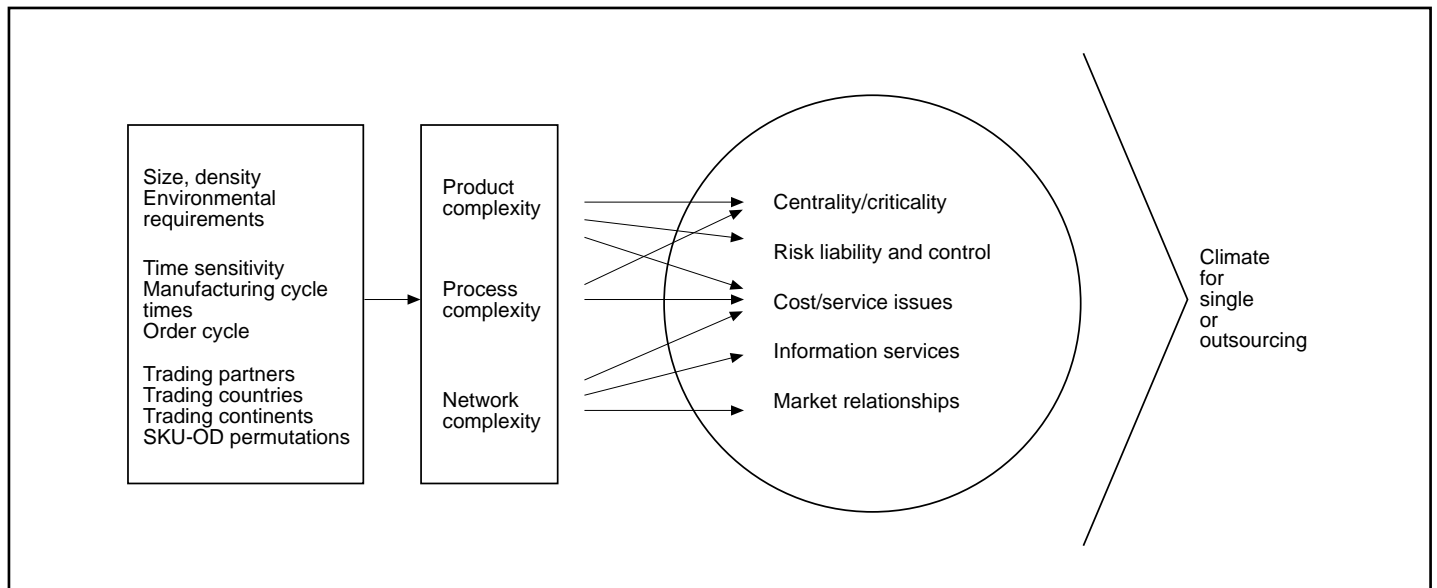
- number of supplying and distribution trading partners;
- number of countries involved in the supply chain;
- number of continents (or regions) involved in the supply chain;
- stock-keeping unit (SKU) and origin/destination (OD) pair permutations.

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.

As Figure 3 shows, 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.

Figure 3. Drivers in the Key Factors Interaction Model



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. As Figure 3 suggests, process complexity can influence centrality and cost/service factors.

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.

Notes and References

1. Outsourcing and single-sourcing refer to the practice by a shipper of awarding exclusive contract to a service provider for handling transportation, warehousing or other logistics functions, singly or in combination, on a segment of its business. Typically single sourcing is the term used to refer to the consolidation of contracts previously distributed among several vendors. Outsourcing is the term used when the activities were previously handled within the shipper's logistics organization.
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5. Fawcett, S.E. and Birou, L., "Exploring the Logistics Interface between Global and JIT Sourcing", *International Journal of Physical Distribution & Logistics Management*, Vol. 22 No. 1, 1992, pp. 3-14.
6. Postponement can take effect in many ways including delaying final assembly as late as possible until the nature of final demand is better known and customizing a product for distribution in specific countries or regions by the use of appropriate labels in the appropriate language and conforming to local restrictions.
7. There has been greater progress in the air freight area with several airlines or airline consortiums developing global booking and tracking systems. In the ocean/surface modes area, some special-purpose telecommunications and logistics systems software companies (e.g. Encompass based in Cary, NC) have been addressing these apparent market deficiencies. A significant influence has been US Customs' adoption of EDIFACT for advanced customs clearance. Also, despite technical difficulties, some large shippers have combined their domestic and global logistics systems.
8. See for example, *Fritz Information Services Capabilities*, Fritz Companies, San Francisco, CA, 1992.
9. Relationships between shippers and their suppliers or customers could also be a further confounding factor affecting the role of intermediaries such as logistics service providers. Increasingly, service providers are finding that they need to "touch" both parties – i.e. develop positive, working relationships with both shippers and receivers. This has particularly strong implications for those carriers and forwarders who have viewed themselves as having a geographic franchise and historically working with only one of the parties.
10. Relational can be further characterized into value-added or strategic. The former indicates that the service providers have augmented their basic services into attractive packages which include additional functions. The term strategic connotes a long-term relationship between the parties where the service provider has become a close and essential component of the shippers' operations.

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