
**THE DETERMINANTS OF LOGISTICS OUTSOURCING
DECISION. AN EMPIRICAL STUDY**

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Key words: logistics outsourcing, transaction costs economics, resource based theory, risk avoidance, dairy industry.

Abstract

Carried out within the French Dairy Industry, this qualitative and quantitative research allowed describing the practices of logistic externalisation in a very little investigated field. The results, treated "activity by activity" showed that contrary to what is often stated, the logistic components of management are rarely outsourced. The article attempts to apprehend the major reasons for this policy. On the other hand, the outsourcing of transport is standardized and the reasons which influence this choice are not only economic. The interest not to treat outsourcing of activities uniformly is thus shown. Theoretical and praxeologic contributions make it possible to show avoidance and risk reduction strategies the benefit of both outsourcer and TPL.

**WYZNACZNIKI DECYZJI DOTYCZĄCYCH OUTSOURCINGU LOGISTYCZNEGO.
BADANIE EMPIRYCZNE**

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Słowa kluczowe: outsourcing logistyczny, ekonomia kosztów transakcji, teoria zasobowa, unikanie ryzyka, przemysł mleczarski.

Abstrakt

Przeprowadzone we francuskim sektorze mleczarskim badania jakościowe i ilościowe umożliwiły przedstawienie praktyk eksternalizacji outsourcingu logistycznego w mało zbadanym obszarze. Wyniki rozpatrywane „działanie po działaniu” wskazują, że w przeciwieństwie do tego, co się często stwierdza, logistyczne komponenty zarządzania rzadko podlegają outsourcingowi. W artykule podjęto

próbę wyjaśnienia głównych przyczyn takiej polityki. Z drugiej strony, outsourcing transportowy jest standaryzowany, a powody takiego postępowania są nie tylko ekonomiczne. Przedstawiono więc też uzasadnienie niejednolitego traktowania outsourcingu różnych działań. Rozważania teoretyczne i prakseologiczne umożliwiły ponadto ukazanie strategii unikania i redukcji ryzyka, korzystnych dla obydwu stron procesu outsourcingu.

Introduction

Since the early 1990s, worldwide practices of outsourcing logistic activities have been increasing, resulting in an annual 10% increase (SOHAIL, SOHAL 2003). The enthusiasm of management for the phenomenon of logistic outsourcing has affected scientific literature (RAZZAQUE, SHENG 1998). Articles and books for the layman aimed at managers often describe ready-made methods (best practices) to achieve outsourcing operations. Yet this literature is not related to any rigorous theoretical frame (LYNCH 2001) and remains mostly descriptive (KNEMEYER, CORSI, MURPHY 2003). At the same time, logistics evolved. Many researchers detected a metamorphosis of this function which, was operational in the years 1960s, and is now becoming increasingly strategic. Although research works on outsourcing are abundant, few focus on outsourcing in the field of logistics. Existing research works are often incomplete and only deal with a particular part of the logistic chain, such as physical distribution (BALLOU 1999), goods warehousing (MALTZ 1994), transport or tailored logistics (GUERIN, LAMBERT 2000), transport for exports (BIGRAS, DÉSAULNIERS 1998, STANK, MALTZ 1996), integrated logistics (RABINOVITCH, WINDLE, DRESNER, CORSI 1999) or supply chain (AMAMI 2001). These research works stress the study of the various configurations and relations resulting from a logistic outsourcing decision rather than the decision factors (AMAMI 2001, KANNAN, TAN 2002, MENON, MCGINNIS, ACKERMANN 1998, SKJOETT-LARSEN 2000). Taking these elements, and the strategic importance of an outsourcing decision (SKJOETT-LARSEN 2000) into account, what are the determinants of outsourcing logistic activities to a T.P.L? Are they economic, strategic or organizational? Which are the most frequently externalized components? What can management act learn from this action? The answer to these various questions initially calls for a choice of theoretical anchoring. From a conceptual point of view, a review of the recent literature showed that the decision of outsourcing can be efficiently dealt with thanks to a dozen theoretical approaches. However, the rational decision paradigm remains the main reference. This is why, the economics of the transaction costs theory inspired from COASE'S (1937) founding work and supplemented by WILLIAMSON (1985) was called upon. It was enriched by certain contributions resulting from the Resource Based View, this theory effectively supplementing economic logic

though the concepts relating to core competencies and performance differential (WILLIAMSON 1999, p. 1106). Carried out within the French Dairy Industry, this qualitative and quantitative research allowed describing the practices of logistic externalisation in a very little investigated field. The results, treated “activity by activity” showed that contrary to what is often stated, the logistic components of management are rarely outsourced. The article attempts to apprehend the major reasons for this policy. On the other hand, the externalisation of transport is standardized and the reasons which influence this choice are not only economic. The interest not to treat the externalisation of activities uniformly is thus shown. Theoretical and praxeologic contributions make it possible to show avoidance and risk reduction strategies the benefit of both outsourcer and TPL.

Theoretical foundations

First it is important to specify that our analysis centred on the outsourcer within the organisation. Other approaches could have been adopted, for instance at the level focusing on the principal but in a B. to B. perspective or centring on the provider.

The determinants of outsourcing logistics inspired by TCE

The transactional approach consists in looking for a match between the features of transaction and the structure of governance: market (spot transaction), hierarchy (internal maintenance) or any other hybrid form between the two, such as contracts, licensing, franchising or brand agreements, alliances, common subsidiaries and so on (WILLIAMSON 1994). In the field of logistics, outsourcing may be considered as a hybrid form of governance among which each accepts different contractual dispositions (DAVID, HAN 2004). According to MÉNARD (2003), this type of tasks delegation, which usually involves resource pooling, resembles a form of hybrid governance. For “hybrid forms”, the obvious choice is the neoclassical contract, which is “more flexible and adaptative than standard contract law” (DAVID, HAN 2004, p. 40). Parties in an exchange (principal and contractor) keep their autonomy while remaining in a state of significant bilateral dependency.

In the field of logistics, which features of transaction explain the decision outsourcing? The goal here is to analyse the specificities linked to the nature of transaction costs as well as transaction characteristics in our particular field.

Manifestations and Nature of transaction costs in the logistic chain

Defined as a combination of physical and informational flows, in a context of exchange, logistics generates transaction costs due to informational asymmetries. An economic transaction consists of three essential steps, each of which may involve costs: (1) Information collecting (2) Bargaining and (3) Performance Controlling.

For example, for an outsourcer, collecting information on prospective suppliers, their competence and capacities, and the customers they supply provides strategic advantages but also generates *ex ante* costs. Similarly, during the “negotiation”, the inequality of information that may exist between a supplier with a great expertise in the field of logistics and an inexperienced principal entails high direct and opportunity costs. As PACHÉ (2002, p. 55) highlights, the suppliers “may deliberately conceal or distort the information they possess in order to benefit from more favourable trade conditions”.

The *ex post* costs consist of various costs: organisation, follow-up, control, re-negotiation of the initial agreement or for a more favourable agreement (PACHÉ 2002, p. 55).

Characteristics of transaction features in logistic field

Assets specificity

In the field of logistics, the degree of assets specificity is a crucial determinant. For PACHÉ and SAUVAGE (1999, p. 108), the degree of assets specificity corresponds to the fact that the activity of physical distribution may sometimes require special handling or warehousing equipment depending on the non standard products and /or market they address. Logistic suppliers have become more and more knowledgeable and demanding. They have developed relatively standardized investments especially in the field of warehousing, packaging and so on, so that the degree of assets specificity tends to decrease. However, reality is not that trivial. Many relatively basic operations such as transport, handling, warehousing and so on require specific and costly investments. We can mention here refrigerated vehicles, deep freeze storing areas for frozen foodstuffs, sophisticated forklift trucks, guidance systems, etc. (BIENSTOCK, MENTZER 1999). The irrecoverable costs of such investments are high and given this situation of bilateral monopoly, the risks of opportunist behaviour are almost inevitable. A high degree of specificity reduces the profits of outsourcing and encourages the principal to organise the given activity in-house. Another situation has been studied by PACHÉ (2002). It describes the

case when logistics suppliers, becoming more and more skilled, develop often very complex tailored services for their customers. Such assets, highly idiosyncratic, little or not redeployable, will result in increased opportunism on the part of logistics professionals. Switching costs for such equipments are exorbitant for the principal. As for site specificities, they are to be found when the logistics supplier purchases equipment for final use which is close to his principal or client, often in a logic of geographical logistics integration. Site specificities more particularly have to do with physical logistic operations: transport, warehousing, packing, labelling and bagging. As they also depend on the nature and volume of goods, they often require heavy facilities and benefit from being completed in given places with the rational objective of cost reduction and also with the objective of improving the proposed service: quality and time (DORNIER, FENDER 2001). Finally, personnel specificities; occur when a supplier develops skills resulting from such training as :learning by doing;, often collectively, to satisfy the individual needs of a client. The elements mentioned above as well as the theoretical predictions of TCE lead us to assume that a high degree of asset specificities reduces the advantages of an outsourcing operation and prompts the principal to organize the logistic activities in-house. In spite of the tendency to confirm the TCE hypotheses, no consensus has been reached yet, all the more so as there are still very little empirical research works in the field of logistics outsourcing. Having laid down these empirical and theoretical elements, we can now formulate **Proposition 1**:

H1. The different activities of the logistics chain require investments that may show a high degree of specificity. In the light of TCE predictions, we should note a tendency to outsource activities requiring assets (physical, site and human resources) with a low specificity. Conversely, a tendency to keep inside the elements of the logistic chain requiring highly specific assets should be observed.

Uncertainty: A reducing attribute of outsourcing?

Both internal and external uncertainties appear to be closely linked in the field of logistics. Internal uncertainty has to do, for example, with the difficulty of companies to estimate precisely their future needs, particularly when it comes to volume (STANK, MALTZ 1996). This type of uncertainty is directly linked to the uncertainty affecting the industry in which the company operates. Consequently it refers more to the transactional hypothesis according to which the firms that must meet fluctuating demand are prompted to resort to external resources for want of flexibility as well as lack of capacity.

Multiple factors contribute to making matters difficult: the unpredictability of the industry in which the firms operate the institutional and regulatory context which is becoming more and more complex and globalization. These

phenomena may not be new, but their detectable influence on the organization of logistics has recently become really perceptible. According to DORNIER and FENDER (2001), the primary effects of uncertainty are twofold: industrial and commercial destabilization. Relocations and the specialization of production units and Just in Time particularly, upset the traditional models of logistic. These strategies generate uncertainty because they cause demand to vary. The marketing strategies stemming from an extreme volatility of consumers' needs, also involve differences between forecasts and actual situations.

According to the precepts of T.C.E., internalization is recommended in contexts of strong uncertainty which generate an increase in transaction costs. Uncertainty results from the burdens of collecting and sorting information, negotiating and drawing up contracts, *ex ante* and *ex post*, renegotiating too extensively, which is all very difficult to manage. On the other hand, as some logistic components of the chain are not regarded as key activities, will T.C.E.'s predictions come true?

Our second proposition is formulated as follows:

H2. In the field of logistics, uncertainty is closely linked to the difficulty for the principals to define the needs that will satisfy an extremely fluctuating demand and the unstable and complex conditions of the external environment with certainty. In case of high uncertainty, we should witness a tendency to internalization, while a tendency to outsource all or part of the components of the logistics chain should take place in case of low uncertainty.

Frequency

Frequency accounts for the degree of repetitiveness of the transaction. This attribute is closely linked to the question of economies of scale. We put forth the theoretical assumption that the costs associated with turning to outsourcing are justified only if the transactions are recurring, by means of the economies of scale. A high frequency is often associated to a low level of asset specificity, which implies that the transactions relate to commodities. Conversely low frequency is associated with idiosyncratic assets and complex transactions. In the field of logistics, in the case of product distribution, for example, the degree of frequency can provide information if the volume of merchandise hauled is high enough to justify the cost of specific in-house equipment (BIENSTOCK, MENTZER 1999). In this case, it is relevant to check whether T.C.E. predictions about the decisions concerning highly-frequent standard activities – such as transport which requires assets whose specificity is low but which are very costly – is validated or not. The same questions may be raised about warehousing, a common activity, which nevertheless requires human, organisational and technical skills that are more and more complex

and particularly linked to the emergence of data warehousing (PRESTON, BROHMAN 2002), which performing firms cannot ignore.

H3. In the field of logistics, costs related to outsourcing are justified only in case of a high degree of frequency. According to theoretical predictions, we should note a tendency to outsource recurring activities. Conversely, non recurring activities tend to be internalised.

The difficulty of performance measurement

According to WILLIAMSON (1991, p. 79), the difficulty of performance measurement between parts does not encourage resorting to external transaction. As a system of management and total control of physical and informational flows, logistics is a complex process, due to the physical operations and the multiple actors who revolve around this activity (THEBAULT, TILMONT 2000). This complexity often means the customer finds difficult to establish his definite needs, the level of performance expected, and so on, so that drafting a contract will often be long and difficult. Moreover, this impossibility foresee everything, particularly when uncertainty is high, will inevitably induce hidden costs (AUBERT et al. 2002) which result from non-fulfilment of contracts and can prove very heavy in the logistic field. Among the various logistic activities, some are easier to check than others. According to PACHÉ and SAUVAGE (1999, p. 108), some physical logistic activities are commonplace, but others such as inventory control, order preparation and sending, constitution of promotional batches (Co-packing), labelling and so on, are more complex modular components, requiring real logistics knowledge and are more difficult to control. This is partly due to insufficient measurability from an accounting point of view (PACHÉ 2002). Thus, in accordance with in the T.C.E, activities which are more complex to control should be integrated. In order to establish our assumption stating that this dimension of the characteristics can influence the choice of governance of a transaction, we asked the outsourcers and TPL interviewed to award our various segments a degree of complexity. These “grades” allowed us to complete formulation of **Proposition 4**:

H4. The nature and multiplicity of the actors who intervene along a logistic chain make this process more or less complex to manage according to the activities which make it up. To measure and control the performance of these activities is therefore more or less complicated. Theoretically, we should observe a tendency to insource logistic activities which are complex to measure and control: quality control, order preparation and sending, planning and organization, financial services, transformation and Supply Chain. Conversely, support activities: transport, storage, packing, labeling and bagging, should be outsourced.

The T.C.T inspired four testable propositions. However, while being focused on the economic aspect, this theory provides only a partial answer to the problem. This is why, the concepts relating to the inherent activities of core competencies and those inherent to the performance differential stemming from the theory of resources have made for a better taking into account of the economic dimensions of the decision-making process. Moreover, as it takes the quality of the resources and competences accumulated in-house into account (DUMOULIN, MARTIN 2003), this current includes a dynamic dimension through striving for long term efficiency (BENSEEBA 2002, p. 300), which is ignored by transaction costs economics.

Contributions of the resource theory to the logistic outsourcing decision-making process

Focus on Core competence

According to BARNEY'S model (1991), five conditions are necessary for logistic activities to constitute resources with an underlying durable competing advantage: their value and scarcity, the difficulty of imitating them, of transferring them and finally of substituting them. Compared with the other types of resources the firms can call upon, some logistic resources seem to us to have several of the stated theoretical attributes:

– value: more than all others, some components of the logistic chain can prove to be contingent resources, i.e. skills, knowledge and know-how which are only applicable in a given firm. By organizing an effective combination of a flow triptych, or even by taking part in production in Co-manufacturing operations or customer service, logistic activities become creative of value and generators of efficiency (CHRISTOPHER 1998, GUILHON, HALLEY 1997). It is also through customer satisfaction that logistics entails a competing advantage for the firm (MORASH, et al. 1996, OLAVARRIETA, ELLINGER 1997). Indeed, with the standardization of the products offered on the market, service to and satisfaction of the consumer are becoming the differentiation criteria strongly influenced by logistics know-how (CHRISTOPHER 1993);

– scarcity derives from the complex combination of specific credits of various nature necessary to the operation of logistics such as some specialized equipment, organizational routines, know-how, competence and experience. Some authors also include interpersonal relations, which are long and difficult to maintain and develop by imitation (OLAVARRIETA, ELLINGER 1997, GAMME-LGAARD, LARSON 2001);

– logistic resources are not easily imitable and transferable: it is the case in particular for the sophisticated information systems of a logistics industry

having to honor increasingly demanding requirements and specifications. Because of causal ambiguity, it is difficult (and expensive) to copy these systems which were created and cemented in a complex tangle of isolated individuals or networks (FERNANDEZ et al. 2000). To work out and control these systems, logisticians require specific knowledge. The experience accumulated in a logistic know-how more and more integrated by companies which regularly question their logistic processes is becoming a source of competitive advantage.

H5. The activities of a logistics chain present features of various strategic importance. A tendency to outsource components of low strategic intensity: transport, storage and of warehousing should be observed. Conversely, a tendency to insource the components of strong strategic intensity should be noted: packing, labeling and bagging, planning and organization, transformation, order preparation and sending, quality control, financial services and Supply Chain.

Performance differential

According to GUILHON and HALLEY (1997), logistics can become a “strategic instrument of improvement and development of the performance”. In other words, logistics creates added value which according to LYNN (1998) is generated by interactions between financial, organizational and intellectual resources of the company. In our research, we primarily retained the collective phenomena of training which contribute to the logistic performance of the firm. They are vectors of competence, tacit resources which can;t easily be imitated and generate a competing advantage (REIX 1995, WINTER 1987, NELSON, WINTER 1982). As GRANT (1991) underlines, to become a distinctive skill, each resource should be considered as a “combination of resources” rather than on their own, distinctive skills thus result from a body of skills possessed by the staff in, or even between the organization and its partners (BLACK, BOAL 1994). The logistics which was defined as a transverse step of control and management of physical and informational flows is at the heart of training processes (HALLEY 1999).

Proposition 6 follows:

H6. The performance of the various components of the logistic chain requires specific skills. A tendency to outsource the components for which the company does not hold these specific skills should be observed. Conversely, a tendency to internalize the logistic components for which the firm holds the skills, thus ensuring the best performance, should be noted.

Contextual Propositions

Three organizational propositions relating to the size, logistics structuring and qualification level of the firm have been chosen to improve the final research model for their relevance in our approach to the research, after a study of the literature and an analysis of exploratory interviews. It is a question of determining whether or not these variables exert a direct influence on the decision to out-or insource logistics (H7, H8, H9).

H7. The Decision of outsourcing all or part of logistic activities should be influenced by the size of the company. Thus, large firms would have a more important propensity to outsource than small companies.

H8. The Decision of outsourcing all or part of logistic activities should be influenced by Level of structuring of the logistic function. Thus, Companies having a high structured logistic function would have a more important propensity to externalize physical logistics activities (Transport, Storage, Warehousing, Preparation of orders and Sending).

H9. The Decision of outsourcing all or part of logistic activities should be influenced by the competence level of the company. Thus, companies having a high competence level would have a more important propensity to externalize physical logistics activities (Transport, Storage, Warehousing, and Preparation of orders and Sending).

Empirical study

A triangulated methodology was adopted: exploratory study through interviews and questionnaires sending. The exploratory study consisted of five talks with company managers in the industry and as many T.P.L. It brought "bubbles of meaning" to the statistical treatment resulting from the quantitative analysis the methodology of which is described below.

Methodology

Data Collection

A survey was sent to the 850 companies which make up the French dairy industry, in the first semester of 2005. The dairy industry is one of T.P.L.'s main customers. It is the second agribusiness industry in France in terms of sales. The dairy industry, distributed on the whole of the territory, includes 700 sites of dairy transformation providing nearly 60 000 jobs. The number of

workers ranges from less than twenty to several thousand. Several firms are of international size and four rank among the top ten European companies in the industry, and the top twenty in the world: Danone (4th), Lactalis (8th), Bongrain (14th), Sodiaal (17th). This branch belongs to an industry which has undergone major technological and social changes: between 1984 and 1998, the industry lost 25% of its manpower due the need for increased productivity but also as a result of increased automation of production and conditioning as well as a tendency to concentration through fusions occurring during the same period. It is especially the case in the milk branch where 70% of the milk is collected by only six great groups, three of which (LACTALIS, CLE BON-GRAINS and SODIAAL) have a sales turnover of more than three billions. Finally, outsourcing certain operations including logistics has also consolidated this trend (Girard & Al, 2002). A total of 105 questionnaires were returned (102 of which were exploitable), which is a 12% return rate. This rate is correct and usual in this type of investigation.

Measurement of the variables

The indicators were created taking the literature and investigation interviews as starting points. The process of measurement of the variables lay within the scope of the widespread paradigm of Churchill. The various scales were purified through main component analysis; Cronbach's alpha with Varimax rotation was systematically used in order to check the reliability of the variables. These various analyses fixed the measurement of the independent and dependent variable groups.

Independent variables

The ACP STATE carried out on the group of explanatory "economic" variables made it possible to isolate six méta-variables, whose Alpha coefficient oscillates between 0.911 and 0.814. The same analysis carried out on the group of explanatory "strategic" variables generated four méta-variables with Alpha values ranging between 0.733 and 0.696. As for the last group, the "organizational" variables, the ACP STATE eliminated the size criterion to only keep the qualification level of the firm (Alpha = 0.865) and the logistic structuring with Alpha = 0.874. After the purification analyses, the final matrix of the explanatory méta-variables includes twelve axes.

The ACP STATE carried out on the nine variables corresponding to the outsourcing choice converged along three axes, the first two of which explain nearly 74% of the variance. The first axis F1 indicates that the whole logistic under activities are subject to a more or less significant outsourcing. Axis F2 is

Table 1

Meta Variables Matrix

Groups of Variables	Meta Variables and their components
1. Economic (TCE issues)	1. Specificity. Difficult rehabilitation (ECOF1) 2. Frequency, Recurrence of activities (ECOF2) 3. Uncertainty of activity and demand (ECOF3) 4. Lawful Uncertainty and of difficulty of recruitment of employees (ECOF4) 5. Activity level (ECOF5) 6. Difficulty measurement performance (ECOF6)
2. Strategic (R.B.V. Issues)	1. Contribution of logistics to profitability of the firm: industrial or commercial activities (STRATF1) 2. Contribution of logistics to profitability of the firm: transport and secondary activities (STRATF2) 3. Contribution to competitive advantage of the firm: industrial or commercial (STRATF3) 4. Contribution to profitability and competitive advantage of the firm: management and Supply Chain activities (STRATF4)
3. Organizational	1. Qualification level of the firm (ORGF1) 2. Logistic Function structuring (ORGF2)

correlated negatively with the following components: transport, storage and warehousing, conditioning and packaging and order preparation: in fact these activities are outsourced most often and most invariably. The axis is correlated positively with the following variables: quality control, planning and organization, financial services, Product transformation and supply chain. Axis F2 thus supplements the information of axis F1 by dissociating governance modes: outsourcing of physical activities. Axis F3 is correlated negatively with very little outsourced activities: quality control, organization and planning, financial services and product transformation. Axis F3 is interpreted as supplementing the information of F1 by dissociating governance modes: outsourcing of non physical activities. The supply chain activity, which is not outsourced, was discarded as the values taken were aberrant and were likely to muddle the other results. In order to study the influence exerted by the various méta-variables (independent) on the choices, step-by-step regression was used.

Table 2

Results of Analysis of regression analysis on the meta-variables resulting from the APC ($n = 102$)

Independent Meta-variables retained by stepwise regression analysis	Dependent Meta-variables Values of the standardized coefficients	
	Physical Activities M1	Activities of logistics Management M2
ECOF1: Assets Specificity	0.250	0.495
ECOF2: Frequency, Recurrence of activities	N.R.*	N.R.*
ECOF3: Uncertainty activity and demand	-0.330	0.356
ECOF4: Lawful Uncertainty and of recruitment of employees	0.501	-0.187
ECOF5: Frequency: importance of level of activities	0.387	N.R.*
ECOF6: Difficulty measuring performance	N.R.*	-0.219
STRATF1: Logistic Contribution to the profitability of the firm: activities of logistics Management	N.R.	N.R.
STRATF2: Logistic Contribution to the profitability of the firm: physical activities	N.R.	-0.479
STRATF3: Contribution to the competing advantage	-0.330	0.356
STRATF4: Contribution to the competing advantage and the profitability of the firm	N.R.*	N.R.*
ORGF1: Level of competences of the firm	N.R.*	N.R.*
ORGF2: Structuration of logistics function	N.R.*	N.R.*
Values of B (Non standardized coefficients) with $P < 0.05$ (5%) * N.R. Non retained		
Recapitulative values of models		
R	0.650	0.863
R^2	0.423	0.745
Adjusted R^2	0.370	0.701
Variation of R^2	0.057	0.018
F	8.057	17.097
Variation of F	4.742	2.871
Anova	0.00	0.00
Tolerance Value	0.998	1.000
VIF(Variance Inflation Factor)	1.002	1.000

Results

The influence of the economic, strategic and organizational factors on the choices of logistic outsourcing

In the two models (M1 and M2) resulting from the analysis of regressions, twelve explanatory meta-variables resulting from the preliminary ACP STATE were introduced to “explain” a dependent variable: outsourcing. With a 5% significance threshold, model M2 (Outsourcing of management activities) provides a “better” explanation than M1: the adjusted R^2 (Outsourcing of physical activities M1) explains 70% of the variance of the dependent variable,

against 37% for M2. The results the Anova, Tolerance and SHARP tables show values indicating that the explanatory variables are not correlated with each other, confirming the good quality of the models.

Outsourcing of physical activities: the dominating Influences

Concerning the outsourcing of physical logistic activities, the equation resulting from the analysis of regressions is: 0.50ECOF4 (Uncertainty of regulations and of hiring staff) + 0.39ECOF5 (Frequency: importance of the level of Activity) – 0.33STRATF3 (Contribution to competing Advantage) + 0.25ECOF1 (Specificity: expensive rehabilitation). The results point to a dominating influence of the variables resulting from transaction costs economics: uncertainty of regulations, Frequency of the activities, Specificity: expensive rehabilitation. Strategic variables are absent apart from STRA F3 (Contribution to competing advantage) which has a negative value: for the managers, support activities do not provide a greater competing advantage. The results concerning the organizational variables are not conclusive of a direct link with the choices. However, moderating effects exceeding the scope of this study could come into play.

Outsourcing of management activities: the influences guiding the choices

The analysis of regressions introduced seven méta-variables out of twelve. Adjusted R^2 indicates that the model explains 70% of the variance. The following equation results from this: Outsourcing of the activities known as logistic management = 0.495ECOF1 (expensive and difficult Rehabilitation) – 0.479STRATF2 (logistic Contribution to the profitability of the firm) + 0.356ECOF3 (Uncertainty of activity and demand) – 0.219ECOF6 (Difficulty of performance measurement) + 0.208STRATF4 – 0.187ECOF4 (Uncertainty of regulations and of hiring staff) – 0.134STRATF3 (Contribution to competing advantage) the choice of allowance is dominated by the economic dimension and the attributes: Expensive and difficult rehabilitation, Uncertainty of activity and demand, Difficulty of performance measurement, Uncertainty of regulations and of hiring staff, stick out. However, strategic considerations, particularly “Contribution to competing advantage and the profitability of the firm” have a greater influence than for basic activities.

Proposition tests

Considering the validation tests, only proposition 3 (Frequency of activities) is validated for physical activities. For management activities, the results are mostly consistent with the theoretical propositions laid down at the outset.

Table 3

Research hypothesis and empirical support obtained

Hypothesis	B : Non Standard. Coefficient	Standard Error	t Value	Supported
H1. Assets specificity – Physical Activities – Activities of logistics Managt	0.252 0.503	0.116 0.080	2.178 6.275	rejected all Activities
H2. Lawful Uncertainty and of recruitment of employees – Physical Activities – Activities of logistics management Uncertainty activity and demand – Activities of logistics management	0.506 -0.189 0.361	0.121 0.080 0.080	4.167 4.511	confirmed for activities of logistics management
H3. Frequency (Importance Level of activity) – Physical Activities	0.390	0.119	3.285	confirmed Physical activities N.R. activities of logistics management
H4. Difficulty of measuring performance – Activities of logistics management	-0.222	0.080	- 2,777	confirmed activities of iogistics management N.R. physical activities
H5. Statagic Importance				N.R. all activities
H6. Competitive Advantage	-0.136	0.080	-1.694	confirmed activities: packing, financial prestations and transformation products. N.R. others activities
H7. Size H8. Level of structuration logistics function H9. Level of competences of firm				non direct influence

Main goals of research

The main goal of this paper was to understand the influence of certain economic, strategic and organizational factors on the decision-making process. In addition to the theoretical contributions, the main results obtained from our statistical analyses and supplemented by the qualitative interviews held with logistic managers suggested several implications for managers.

Theoretical contributions

They result primarily from the application of transaction cost economics to the “make or buy” decision in a little explored field. The results indicate that, apart from for the “Frequency” attribute, the theory was not verified for the physical, and therefore peripheral, activities. These results match those of MURRAY, KOTABE (1999) in Information Systems Outsourcing.

Implications for managers

Elementary statistics relating to outsourcing of activities show that support activities (transport, storage and warehousing) are the most outsourced. This choice is made mainly for economic reasons. These results, strengthened by the qualitative interviews, enabled us to list the risks related to outsourcing and put forward strategies and other

measures of reducing or even avoiding these risks (*See table 4 below*). As for outsourcing management activities, the question of “why not” comes spontaneously to mind... The components of management and S.C.M., usually externalized in the U.S., are primarily insourced. The more strategic and complex to manage the components are, the less outsourced they are. Outsourcing becomes a decision of core management which relates to the company’s business and its perimeter of activity. That’s why there are so many risks. Contextualization greatly contributes to this position. Because of a strong belief in the industry’s heritage, dairy industrialists, who supply products intended for human consumption, do not wish to entrust the supply chain management activities, which are very close to their products and therefore to the customer, to a TPL, even a very experienced one. As interviews and regression analyzes suggest, management activities contribute more to the competing advantage and the profitability of the firm than support activities do. The risk of losing collective skills, expertise accumulated over the years on quality, know-how, image and so on, through outsourcing is too high, all the more so as “you cannot write everything in a contract”... Unlike in Anglo-Saxon countries, people management is preferred to contract management by far! “Noble” logistic activities are also maintained in-house because reinstating them would be difficult (“impossible” according to some managers) and crippling in cost. The ghost of change management is all too real and foreseeable organizational disorders put managers off right from the start. All these considerations, confirmed by the results, get in the way of many writings which assimilate European logistics outsourcing practices to Anglo-Saxon practices... Outsourcing finally implies a change in the philosophy of business

to avoid a detrimental “organizational decline”. Indeed, entrusting an activity to someone outside the company does not mean giving it up; the client is still managing his resources, but in a different way. To be unaware of this would be to expose oneself to definite management disorders.

Table 4
Reasons, risks and avoidance strategies of externalisation

Reasons for outsourcing physical activities	Induced risks	Risk reduction and avoidance strategies
1	2	3
Economic (TCE)	latent opportunism of the TPL, contractual information asymmetry, uncompleted contracts involving overcosts, hidden or unforeseen costs, ... dependence	knowing the identity of the selected TPL perfectly well being extremely vigilant about newcomers entering the TPL market being rigorous when drawing up the contract: price and performance control clauses, or building a long term relationship based on confidence, well-tried interpersonal relationships ... taking contract negotiation costs and the partner's service control into account providing for effective arbitration clauses in the contract, in case of litigation. defining service quality indicators precisely setting up rigorous management control (making sure that IS are compatible) having extensive in-house legal expertise or calling upon external expertises defining rigorously which activities to out-source and which to keep in-house foreseeing situations which may result from the state of dependency between parties: staff morale or frustrations which might prove detrimental to smooth exchanges
Transfer of the constraints related to the variation of consumer demand	provider incapacity	evaluation of TPL : making sure that the TPL has sufficient means (human and physical) to cope
Transfer of health and regulation constraints to the TPL	incapacity, opportunism of the provider loss of expertise organizational Decline	evaluation of the supplier maintaining a safeguard structure: preserving minimal in-house competence to avoid total loss of expertise and problems related to opportunism (hidden or incomplete information,..) setting up strict follow up and control (for perishables intended for human consumption)

cont. table 4

1	2	3
Transfer of social Constraints	social risk: change in work relations deterioration of the social climate, collapse of the work community, loss of the sense of group work	setting up ex ante adequate communication a dialogue with the employees concerned making sure the TPL looks after the transferred employees' career
Transfer of the investment burden of (refrigerated trucks, forklifts, storage areas.) to the TPL	incapacity, incompetence of the TPL loss of expertise and skills	checking of the financial stability and durability of the TPL maintaining minimal in-house competence negotiating preliminary dialogue on and a say in equipment choices choosing key resource persons both in-house and in the TPL
Transfer of the problems related to product quality and customer service	provider incapacity depreciation of brand image and reputation, loss of customer trust interdependence of activities: depreciation of brand image and outsourcer's reputation dilution of responsibilities cultural Inadequacies with the TPL inefficiency of the working relationship between parties	making sure of the TPL's expertise in this field checking the TPL's good reputation requiring references from other clients and skill demonstration identifying the links which may exist between the activities to outsource and those to be kept in-house provide mechanisms for optimal coordination between activities clearly defining respective responsibilities and obligations between outsourcer and TPL, (even the TPL's subcontractors) making sure the TPL has a compatible culture (quality, H.R...) preliminary meetings between managers, joint training courses.

Limits and future research

Our conclusion aims to present the limits and prospects for open research. This study's theoretical limit primarily lies in the choice of theories, as the decision to outsource is extremely complex (BALDWIN et al. 2001, HOOD, STEIN 2003). Thus, the currents involved are unaware of many aspects of this protean decision. Risk also derives from this complexity, all the greater as the entrusted activity is strategic, as the results of this study have shown. Methodological limits are linked to the questionnaire (the number of questions was deliberately limited so as not to take up too much of the managers' time) and the combination of "measurements" of the attributes resulting from the TCE or inspired by the Resource Based View. Besides, the respondents may have got confused, thus muddling up the results. A degree of uncertainty is related to

the quality of the measurement of transactional variables, which are abstract concepts or concepts which the canvassed companies don't master. The same interrogation applies to the strategic variables; indeed, the deficiency of the empirical tests led us to build most evaluation criteria.

Logistics remains a heuristic field neglected by researchers (PACHÉ 2002). However, many phenomena lead to future reflection. For example, is the current wave of insourcing symptomatic of failed outsourcing operations? Or are there other underlying reasons, and if so what are they? Similar questions may be asked about delocalizations towards emergent countries....The increase in spot transactions related to the fast development of E-Business is another example. With the appearance of new actors and new organization modes (REGAN, SONG 2001), how do we categorize this new type of transaction? Which are the sources and transaction costs accompanying them? What are the risks for the customers?

Research would greatly benefit from being undertaken in different branches of industry and from taking into account recent phenomenon of sustainable development which lead to new questionings and great organizational reconsiderations.

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