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Identifying the Objectives of Outsourcing Logistics Services as a basis for Measuring its Financial and Operational Performance

Carlos Sanchís-Pedregosa, María del Mar González-Zamora, José A. D. Machuca

***Abstract*—**Logistics outsourcing is a growing trend and measuring its performance, a challenge. It must be consistent with the objectives set for logistics outsourcing, but we have found no objective-based performance measurement system. We have conducted a comprehensive review of the specialist literature to cover this gap, which has led us to identify and define these objectives. The outcome is that we have obtained a list of the most relevant objectives and their descriptions. This will enable us to analyse in a future study whether the indicators used for measuring logistics outsourcing performance are consistent with the objectives pursued with the outsourcing. If this is not the case, a proposal will be made for a set of financial and operational indicators to measure performance in logistics outsourcing that take the goals being pursued into account.

***Keywords*—** Outsourcing; Performance measurement; Logistics; Objectives; Indicators

I. Antecedents and objectives

PERFORMANCE measurement is widely considered in the literature to be one of the key points for facilitating the success of any organisation as it produces essential knowledge about performance for enabling competitive results to be achieved ([1], [2]). At the same time, the growing trend towards outsourcing makes it increasingly necessary for the focus of performance measurement to take into account the fact that companies are part of supply chains rather than consider them as separate entities. This aspect is stressed in the Performance Measurement Research Agenda [3].

Logistics services stand out among the activities that are usually outsourced [4] as it seems to provide many advantages: improved customer service, cost savings, etc. [5], [6].

Carlos Sanchís-Pedregosa G.I.D.E.A.O. Research Group. Departamento de Economía Financiera y Dirección de Operaciones, Facultad de Ciencias Económicas y Empresariales, University of Seville, Avda. Ramón y Cajal, 1, 41018 Sevilla, Spain (phone: +34 954 557205; fax: +34 954 557570; e-mail: csanchis@us.es)

María del Mar González-Zamora, G.I.D.E.A.O. Research Group, Departamento de Economía Financiera y Dirección de Operaciones, Facultad de Ciencias Económicas y Empresariales, University of Seville, Avda. Ramón y Cajal, 1, 41018 Sevilla, Spain (phone: +34 954 556456; fax: +34 954 557570; e-mail: mmgonza@us.es)

José A. D. Machuca, G.I.D.E.A.O. Research Group, Departamento de Economía Financiera y Dirección de Operaciones, Facultad de Ciencias Económicas y Empresariales, University of Seville, Avda. Ramón y Cajal, 1, 41018 Sevilla, Spain (phone: +34 954 557610; fax: +34 954 557570; e-mail: jmachuca@cica.es)

Performance has to be measured for these advantages to be guaranteed [7] with the goal of confirming that the objectives being pursued are being achieved. This must be done through a set of indicators that can be measured using both objective financial and operational data [8].

The above shows that logistics performance measurement is considered to be a topic of major importance and its implementation, a challenge [9]-[11]. This is the reason why we thought it would be of interest to focus one of our lines of research on the topic. We share the opinion of many authors [12]-[15] who consider that the objectives of logistics outsourcing (and any developments in these) must be a core part of performance measurement and design if a set of indicators is to be established that enables performance to be measured adequately. This would enable the extent to which the goals -both tangible and intangible- set by the company when outsourcing, to be evaluated [16] [7] and any changes to be adapted to. This is in line with other points in the Performance Measurement Research Agenda [3], which recommends that performance management be designed and developed in-company rather than by implementing a simple performance measurement system; it also has to be done dynamically and flexibly and in such a way as to allow both tangible and intangible assets to be measured.

A number of different authors have contributed to identifying the most important indicators that should be taken into account when making the decision to outsource logistics services. Most have done so via surveys focusing on a given country and/or particular industrial sector (e.g., [17] [18]), but very few have used literature reviews (and those that have, have referred to a very limited number of bibliographical references (e.g., [19]). The aim of our study is to make a contribution to the topic and to arrive at a wider list of objectives for logistics outsourcing than those that already exist while analysing the objectives in greater depth (with a description of the objectives and their various dimensions, should they exist). This would be the first step in a broader study (already underway and which we hope to conclude before the date of the conference) and would enable us to analyse whether the indicators used to measure the performance of logistics outsourcing are consistent with the objectives that should, in principle, be pursued by outsourcing. The end goal of the study is to arrive at a coherent proposal for a set of financial and operational indicators for measuring the performance of logistics outsourcing that takes into consideration the set of goals being pursued and that is in line with the above-mentioned Research Agenda [3].

It should be stated that our research is framed within the international High Performance Manufacturing (HPM) project, the objective of which is to determine what influence various advanced production practices (TQM, Lean Manufacturing, SCM, etc.) have on company performance in the global context. The theoretical base takes into account aspects related to human resource management, organisational behaviour, the theory of organisation, strategy, operations management, international business and other relevant fields.

A critical part of the project has been the creation of an international database of components manufacturing plants in the machinery, electronics and automotive sectors. This will enable a range of hypotheses regarding the factors that contribute to the success of high performance manufacturers and their relationships with plant performance to be verified, for which a series of questionnaires are used. The database was designed using stratified sampling which enables the required number of plants to be obtained for each country/industry combination. The HPM project was launched in 1991 and to date three study rounds have been completed. The questionnaires were sent out to 45 plants in the US during the first round (1991). For the second round (1997), the number rose to 160 plants located in 6 countries in Asia, Europe and North America. For the third round (2004), the number of companies taking part increased to 270 in 9 countries. The 4th round of the project is currently getting underway and the number of countries has risen to 16. New aspects for analysis have also been added. Growing pressure to reduce costs and increase efficiency has led many companies to outsource services and so it was decided to add scales referring to outsourcing to the 4th round of the HPM project. Part of these scales relates to logistics, as it is one of the most outsourced activities. We have undertaken a literature review for the objective of this study. We selected and analysed articles that list objectives for logistics outsourcing. Section 2 details the methodology used and Section 3 presents the findings. As will be seen in this section, the findings lead us on to a more specific description of these objectives and any dimensions that they might have being provided in Section 4. Finally, the last section presents a number of final considerations.

II. Methodology

A comprehensive review of the specialist literature was conducted for this study. Articles that address (completely or partially) the objectives pursued by logistics outsourcing have been analysed. Bearing in mind that the recommended time period for a review of this type is 15 years [20] and has been used by a number of authors (e.g., [21]; [22]) the 1996-2011 period was taken as the timeframe. Articles were searched for on the ABI/INFORM and SCOPUS databases using a systematic and rigorous process with successive iterations and the consequent refining of the key words used in the search. At the conclusion of this process 17 articles had been identified of which 12 were chosen on the basis of the quality of the journals in which they appeared: to be specific, they had to be indexed in two of the most acknowledged databases: ISI Web of Knowledge and SCImago.

These 12 articles represent a greater number of bibliographical references than has been used in other studies that have conducted literature reviews of the objectives of logistics outsourcing (more precisely, 40% more than in [23], which is the study that had to date used the greatest number of bibliographical references).

The 12 chosen articles were analysed in detail to mine and contrast the goals pursued by logistics outsourcing according to each of the articles. This enabled us to draw up an initial list of objectives in order of importance (greatest to least) depending on the number of articles that they were mentioned in (see Table I). However, as 7 of the articles analysed classify the articles on the basis of their importance, we used this information to draw up a second, hierarchical list (see Table II). This list classifies the objectives according to their overall importance in said 7 articles. It should be noted that the non-inclusion of 5 articles for consideration in the second list did not result in any relevant information being lost as the same objectives appear in the first list, although in a different order.

All 12 articles were used to mine other interesting complementary information (the research method used in the article, the sector that outsources the logistics service and the geographical area on which the study focuses). The aim is to use this information to contextualise the studies and it will also help additional conclusions to be drawn.

The following Section presents the findings of the bibliographical review contrasted with the objectives of logistics outsourcing. We also add a description and any dimensions there might be to these objectives.

III. Findings

According to our findings, the literature review revealed 13 objectives that companies normally pursue with logistics outsourcing. However, we decided to select those that are named by at least two authors in order to work with the objectives that have a minimum of support in the literature. The result was a list of 10 objectives, which are set out in Table I.

TABLE I
LIST OF OBJECTIVES AND STUDIES IN WHICH THEY ARE CONSIDERED

Objectives	Núñez-Carballosa and Guitart-Tarrés (2011) [23]	Hsiao et al. (2010) [24]	Sahay and Mohan (2006) [6]	Wilding and Juriado (2004) [25]	Sohail and Sohal (2003) [26]	Sum et al (2001) [5]	van Laarhoven et al. (2000) [27]	Bhatnagar et al. (1999) [18]	Fernie (1999) [17]	Boyson et al. (1999) [28]	Razzaque and Sheng (1998) [19]	Sink et al. (1996) [29]	No. of articles in which they appear
Focus on primary activity	X	X	X	X	X	X	X	X	X	X	X	X	**12**
Cost savings	X	X	X	X	X	X	X	X	X	X	X	X	**12**
Improved flexibility	X		X	X		X	X	X	X		X		**8**
Access to latest techniques and experience	X	X	X	X	X			X	X	X			**8**
Improved customer service			X		X	X	X	X	X			X	**7**
Improved return on assets	X	X	X	X					X		X	X	**7**
Access to unknown markets			X	X		X			X			X	**5**
Supply chain productivity			X			X		X			X		**4**
Supply chain re-engineering		X					X			X			**3**
Increased inventory turnover			X								X		**2**

As already indicated in Section II, there are 7 articles that rank the objectives of logistics outsourcing in one way or another and set distances between them. This provides some extremely important information. We have used this information to draw up a new list of objectives ranked according to the information mined from the literature consulted (see Table II). As each of these studies all use different scales to classify the objectives, we have had to standardise the classifications in order to be able to analyse them jointly. We used the analytical hierarchy method [30] for this, which has provided us with weights for each of the objectives on a normalised scale [0, 1]. These weights have been calculated as the coefficient between the value associated with each objective and the sum of the values associated with all of the objectives together in the same classification. Sahay and Mohan [6], for example, indicate that the Cost savings objective is considered by 81% of the surveyees, while the Focus on primary activity objective is considered by 76% (and so on, with values continuing to be associated with the 9 objectives that are being ranked, as seen in Table II). The coefficient of the value associated with objective 1, Cost savings (81), divided by the sum of the values associated with the 9 objectives listed by the authors (403), provides the resulting normalised weight associated with each objective, in this case, a value of 0.2. The same method was used to calculate the final weight shown in the last column, which enables the various objectives to be ranked in order of importance.

As can be seen, although the objectives that appear in the list in Table II are the same as those in Table I, the order they are in is not the same.

In our opinion, this second list differentiates between the objectives more clearly on the basis of the importance that they are assigned. By way of example, Cost savings, with a weight of 0.24, is the most important objective on the list outdistancing the second most important, Focus on primary activity, which has a weight of 0.18, by a long way. However, the two are afforded the same degree of importance on the first list (i.e., they have been mentioned in the same number of articles). Also in the second list, the next objective in importance after these two is Improved flexibility, with a weight of 0.15, followed by Improved customer service and Access to latest techniques and experience. The remaining objectives are of only minor importance.

It is interesting to highlight the fact that none of the objectives on the list is directly time-related despite the obviously important role of time for company competitive advantage [3] [31]. Only one of the studies analysed [5] mentions this variable, and then as a component of the Improved customer service objective. This shows how interesting it is to provide detailed descriptions and any dimensions of the objectives to be considered. And this is what the following Section is devoted to.

IV. OBJECTIVES: DESCRIPTIONS AND DIMENSIONS

Most of the objectives mentioned in the previous section are broad concepts that include a wide range of related aspects. It is therefore important to have as clear a description as possible of these objectives and, should they exist, their dimensions.

TABLE II
LIST OF HIERARCHISED OBJECTIVES

Objectives	Sahay and Mohan (2006) [6]		Sum et al (2001) [5]		Wilding and Juriado (2004) [25]		van Laarhoven et al. (2000) [27]		Bhatnagar et al. (1999) [18]		Fernie (1999) [17]		Boyson et al. (1999) [28]		TOTAL Weight	TOTAL Order
	Order	Weight	Order	Weight	Order	Weight	Order	Weight	Order	Weight	Order	Weight	Order	Weight		
Cost savings	1	0.20	1	0.19	3	0.2	1	0.3	1	0.2	3	0.2	1	0.5	0.24	**1**
Focus on primary activity	2	0.19	6	0.13	4	0.2	4	0.2	3	0.1	2	0.2	2	0.3	0.18	**2**
Improved flexibility	7	0.11	3	0.18	2	0.2	3	0.2	4	0.2	4	0.2		0	0.15	**3**
Improved customer service	3	0.18	2	0.18		0	2	0.2	2	0.2	5	0.1		0	0.13	**4**
Access to latest techniques and experience	8	0		0	1	0.2		0		0.1	1	0.2	3	0.1	0.08	**5**
Improved return on assets	4	0.17		0	5	0.1		0		0	6	0.1		0	0.06	**6**
Supply chain productivity	6	0	4	0.17		0		0	5	0.2		0		0	0.05	**7**
Access to unknown markets	9	0	5	0.16	6	0.1		0		0	8	0.1		0	0.04	**8**
Supply chain re-engineering	0	0		0		0	5	0.1		0		0	4	0.1	0.03	**9**
Increased inventory turnover	5	0.15		0		0		0		0		0		0	0.02	**10**
TOTALS		1		1		1		1		1		1		1	1.00	

We provide these descriptions below in the same order as in Table II, bearing in mind that any objective might be related to any of the other objective(s) on the list:

1) Cost savings; According to Transaction Cost Economics Theory [32] [33], outsourcing a product or service occurs when the cost of purchasing a good or service externally is more cost efficient than producing it internally. This is why cost savings was identified above as the main reason for outsourcing within the industry [34]. As was seen in the previous section, the objective that most appears for logistics in this regard is a reduction of overall costs, having the right materials, at the right place at the right time [35]. Lau and Zhang [36] relate the following dimensions to cost savings with respect to outsourcing in general: improved profitability, improved operational efficiency, value added to product, improved cash flow and greater efficiency.
2) Focus on primary activity; Broadly-speaking, outsourcing enables resources to be redirected from activities that are not strategic for the company to other activities that generate added value for the final customer (Resource Theory [37]). This focus can be understood on the one hand as freeing up company management from the time and effort that has to be devoted to the outsourced function (in our case, logistics) or, on the other, the freeing up of company financial resources normally set aside for the activity that is being outsourced, in our case, logistics. The second of these two dimensions is directly related with the Improved return on assets objective that will be looked at below. Lau and Zhang [36] also refer to the following dimensions as being focus on the primary activity-related: increased competitiveness, improved customer satisfaction and exploiting the company's skills and resources.
3) Improved flexibility; When a company outsources an activity there is a shift in the fixed costs produced by that activity to a cost variable that is settled with the supplier depending on the volume of work done by the supplier during a set [38]. Reducing fixed costs to the benefit of variable costs is therefore one of this objective's fundamental dimensions. When the transport function is outsourced, for example, the maintenance expenses for the fleet of vehicles, the cost of drivers, etc. become a variable cost that depends on the volume of work outsourced. This means that the company adapts more easily to variable demand and reduces the risk of resources being underused. Other dimensions to be taken into consideration that are related to flexibility [39] refer to such wide-ranging aspects as customisation of the service provided, adapting to changes in the volume of the service provided, the improved response of the outsourced process and building up a wide variety of resources to combat uncertainty.
4) Improved customer service; According to Agency Theory [40] a company decides to outsource a service if it thinks that the agent (the company outsourced to) is capable of carrying out said service in a more effective

way than the company that is outsourcing can do itself. In logistics these improvements in the service translate into the following dimensions: reduced delivery times, on-time deliveries, and fulfilling customer expectations for quality of service [5]. This then has a knock-on effect and increases customer satisfaction, which in turn contributes to improved company competitiveness [35].

5) Access to latest techniques and experience; When a company detects that its internal abilities for carrying out a function are not adequate for competing in a changing market, it outsources the activity to a highly competent third party with well-trained staff which uses its industry's best practices. This access to the latest technologies is related to the dimensions of technologies, skills and services/innovative ideas which the company would not be able to have access to except through a third party [41]. In the case of outsourcing logistics services, the specialists in the sector are able to find solutions to changes in the market in the face of technological advances [19]. This is related to the Improved flexibility aspect commented on above. Finally, Lai et al. [42] showed that thanks to technological abilities acquired through logistics service providers, outsourcing companies' competitive advantages improved on the back of better levels of cost savings, customer service and innovation.
6) Improved return on assets; As previously indicated, outsourcing enables a better use to be made of resources, which can be focused on the company's main activities. These improvements lead to a better return on assets if the company is already operating or a smaller investment in assets if the activity is newly created [38]. Supply chain-related assets include accounts receivable, immovables, equipment and inventories [43]. Thanks to the outsourcing of logistics services, the number of these assets that is required falls, which in turn increases the company's level of liquidity, which then has a positive effect on profit.
7) Supply chain productivity; This is a specific objective directly related to logistics activities, which are one of the basic components of an organisation's supply chain. Improvements resulting from outsourcing logistics must have a favourable knock-on effect on supply chain productivity [6]. When logistics services are outsourced there is also an improved focus on improving the value chain which entails an increase in productivity [44]. This is due in part to the fact that when agents involved along the supply chain are well-disposed towards collaboration, this can boost coordination for developing and introducing new products through advanced optimisation-based methods [45].
8) Access to unknown markets; When they outsource services, companies choose suppliers who help them to gain access to new markets. They thus achieve an increase in their sales that enables them to obtain economies of scale [39]. This move towards the outsourcing of logistics services entails companies choosing operators that have a presence in markets other than their own so that the logistics companies can deliver their products efficiently. Markets are considered to be different (or unknown) when they are located in geographical areas where the company does not operate, or when there are groups of customers that have differentiating features and require goods or services that are to a certain extent different from what the company offers. In the latter case there is a close relationship with the Improved flexibility objective commented on above.
9) Supply chain re-engineering: Process re-engineering leads to major improvements in costs, services and quality [38]. By outsourcing logistics-related functions to a world-class supplier, an organisation can undertake supply chain re-engineering projects to adapt to fluctuations in demand or in order to supply its products to international markets [24]. As can be seen, this objective has close ties with the previously-described objectives of Improved flexibility and Access to unknown markets.
10) Increased inventory turnover; By coordinating production and transport plans, the outsourcing of logistics services reduces inventories and increases their turnover speed [46]. This has a knock-on effect on cost reduction and improved supply chain productivity. This objective is very closely related to improved return on assets as inventoried products make up almost half of assets in most industries [47] and faster inventory turnover has identical effects to improved ROI.

As already mentioned previously, it should be stated that the wide variety of objectives found and their manifold dimensions demonstrate the need for using a set of both financial and operational indicators when developing the management of logistics services outsourcing, and that these indicators should be consistent with the objectives.

V. Contribution and Final Considerations

This study has identified and described the most relevant objectives pursued by organisations when outsourcing logistics services according to the specialist literature. The resulting list of objectives was larger than existing lists and also analysed in greater depth (see, for example, the Wilding and Juriado [25] list), as none of the previous studies include a description of the objectives indicated. It should be stated that 9 of the earlier papers focused on a country or geographical region (India, Europe, etc.) while 3 focused on specific economic sectors (the retail sector, the food industry, and consumer goods), whereas our study is not restricted to any country or sector in particular and includes all the above. With respect to the methodology used, it should be highlighted that surveys were used in 8 of the previous papers, 1 was based on a case study and 3 undertook literature reviews.

It should also be added with regard to these literature reviews on the objectives of logistics outsourcing that we have used a greater number of bibliographical references than any earlier studies, which use a maximum of 7 bibliographical references.

We would like to remind readers that identifying, classifying and describing the objectives all forms part of wider (ongoing) research which seeks to make a proposal of both financial and operational indicators for measuring the performance of logistics services outsourcing in accordance with the goals of the research and, therefore, based on the list provided herein.

With respect to anticipated repercussions, the findings can enable logistics operators to make their services more competitive, as the aspects on which they need to focus have been identified and defined. They can therefore offer services that are adapted to their customers' most important goals for logistics service outsourcing. However, from a contingency point-of-view, each particular case will be conditioned by the context and the company's internal circumstances, which means that the priorities will have to be duly adapted in each specific case.

Finally, on the academic level, it should be highlighted that, as mentioned above, our research is framed in the international High Performance Manufacturing (HPM) project. The findings of this study have enabled aspects in the area of logistics service outsourcing to be selected that should be taken into account when evaluating the performance of this activity within the HPM context. The results have thus been used to develop the scales in the questionnaires which will be used to validate the various hypotheses put forward regarding the outsourcing of logistics services in the framework of the above-mentioned project

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Carlos Sanchís Pedregosa (Seville-Spain, 1982), Graduate in Research and Market Techniques, University of Seville, 2007, Diploma degree in Economic and Business Science, University of Seville, 2005 and Masters Degree in Advanced Business Management Studies (University of Seville), 2009.Member of G.I.D.E.A.O Research Group (Universty of Seville), qualified as a Group of Excellence by Plan Andaluz de Investigación, Desarrollo e Innovación (PAIDI). Research fellow in competitive funded projects at the national level. His current research focuses on Service Operations Management and performance indicators.

María del Mar González Zamora (Seville-Spain, 1970), Dr. of Business Management, University of Seville, since 2000 and graduate in Economics and Business Science, University of Seville, in 1993.Associate Professor at the University of Sevilla, where she has taught for the last seventeen years in the areas of Operations Management and Business Simulation with System Dynamics. Researcher in funded projects both within the European Union framework and at the national level. Coauthor of articles in scientific Journals, such as Journal of Operations Management, Journal of Service Management as well as papers presented to national and international conferences (European Management Association, Production and Operations Management, System Dynamics, etc.). Her current research focuses on Service Operations Management and the design and creation of business games for transparent learning environments based on System Dynamics.Dr. González-Zamora is a member of various scientific associations: EurOMA (European Operations Management Association) and ACEDE (Economics and Business Management Scientific Association). She shares the following awards in this field: the 2001 Wickham Skinner Award on Teaching Innovation Achievements, awarded by the Production and Operations Management Society; nomined for the prestigious European IST Prize (2001); 2002 AEDEM-MED Academy of Management Award on Management Education; Honourable Mention at the 2002 Instructional Award Competition (Decision Science Institute)

Dr. José A. D. Machuca (Seville, Spain), Dr. of Industrial Engineering, Master in Business Administration and in Industrial Engineering, Professor of Operations Management, University of Sevilla (Spain). Director of GIDEAO Research Group, Former Head of Department (1982-1992) and Former Vice Dean (1983-1989), Vicepresident EurAfrica of POMS (Productions and Operations Management Society) and member of the EurOMA Board (European Operations Management Association). Coordinator of the European Thematic Network for Excellence in Operations and Supply Chain Management Education, Research and Practice (Thenexom).