Logist. Res. (2013) 6:133–144
DOI 10.1007/s12159-013-0110-8

ORIGINAL PAPER

Examining logistics outsourcing practices in the United States: from the perspectives of third-party logistics service users

Hokey Min

Received: 14 March 2013 / Accepted: 25 September 2013 / Published online: 12 October 2013

Abstract Ongoing global recession forced many firms to change the direction of their business strategic thinking. This change in a strategic thinking includes the reassessment of current business practices that may not necessarily add the highest value to the supply chain process and may not bring the highest possible return from the allocated resources. As such, outsourcing strategy that allows the firm to focus on its core competency has gained popularity over the years. One of the supply chain activities that are often outsourced is logistics as evidenced by a continued growth of the third-party logistics (3PL) industry across the world. To help firms formulate wise logistics outsourcing strategy, this paper examines the common logistics outsourcing practices among the US firms and identifies key determinants influencing their logistics outsourcing decisions. It also explores the current logistics outsourcing trends in terms of customer value propositions. Examples of such trends that this study discovered were the increased outsourcing of global logistics practices and a short-term duration of the logistics outsourcing contracts. Furthermore, this paper identifies the best-in class 3PLs based on their users' experiences with those 3PLs as guidance for future benchmarking efforts.

Keywords Third-party logistics · Logistics outsourcing · Exploratory analysis · US firms

H. Min (✉)
James R. Good Chair in Global Supply Chain Strategy, Department of Management, BAA 3008C, College of Business Administration, Bowling Green State University, Bowling Green, OH 43403, USA
e-mail: hmin@bgsu.edu

1 Introduction

With the world economy deeply mired in the worst recession in decades, many firms search for every possible means to enhance their managerial efficiency. One of such means includes logistics outsourcing. Generally, logistics outsourcing is defined as a subcontract arrangement whereby a logistics service provider performs a range of services for a firm that could be, or have been provided, in-house [42]. Logistics outsourcing allows the firm to focus on its core competency and exploit external resources and expertise in handling its logistics activities. In other words, logistics outsourcing involves any form of externalization of logistics activities previously performed "in-house." The theoretical underpinnings of logistics outsourcing are often predicated on the transaction cost analysis and network theory [68]. According to the transaction cost theory, when transaction costs are low and transaction uncertainty is high, logistics outsourcing can be more appropriate than in-housing [82]. Also, according to the network theory, the firm's relations with its logistics service providers through outsourcing contracts can constitute its most valuable intangible resource (e.g., logistics knowledge and competencies) and thus create competitive advantages over its rival [19, 23, 59]. To elaborate, the potential benefits of logistics outsourcing include the following: cost savings, improved cash flows, better asset management, greater distribution networks, quicker customer responses, a reduced burden for capital investments, and supply chain flexibility [7, 8, 10, 79]. Realizing these benefits, 70 % of the US firms outsourced their logistics operations to some extent for the last two decades [4]. The popularity of logistics outsourcing is further evidenced by a gradual growth of the third-party logistics (3PL) industry in terms of its sales revenue and diverse service offerings for the last two decades. Though suffering from a slight decline in 3PL growth during

2009, the 3PL industry generated more than $120 billion of revenue in 2010 [14]. Riding a new wave of momentum, the 3PL revenue reached $141 billion in 2011 [29]. Due to a wide range of 3PL service options available from the ever-growing 3PL industry, the 3PL selection decision often poses unique challenges (see, e.g., [5]). These challenges may include the following: (1) the identification of logistics functions that need to be streamlined and outsourced; (2) the constant evaluation and monitoring of 3PL performances; (3) the coordination of outsourced logistics activities through frequent communication with selected 3PLs; (4) the preparation of a request-for-proposal (RFP) or request-for-quotes (RFQ); (5) contract renewals; (6) the establishment of a long-term relationship with trustworthy 3PLs. The failure to deal with these challenges may significantly disrupt the 3PL user's supply chain operations and bring more harm than good, since the 3PL user contractually relies on the 3PL to provide timely and cost-efficient logistics services to its end customers.

Considering the various challenges of logistics outsourcing, it is important for the 3PL user to develop a careful strategic plan before making its decision on the scope of logistics outsourcing, 3PL selection, contract negotiation, relationship building, performance appraisal, conflict resolution, and contract renewal. To help the 3PL user develop such a plan, this paper conducts a questionnaire survey of the US firms and identifies the common logistics outsourcing practices that can be developed into the "best-practices." This paper also develops potential performance metrics or key performance indicators (KPIs) that can be used to evaluate the 3PL performances and then determines the benchmark ("best-in class") 3PL among the six leading 3PLs (i.e., UPS Supply Chain Solutions, FedEx Supply Chain Solutions, Ryder Logistics, Menlo, C.H. Robinson, Exel) in the United States which can be emulated by other 3PLs. These metrics can provide a distinction between more successful and less successful 3PLs and thus help identify key success factors for logistics outsourcing [26, 76]. With this in mind, this paper addresses the following research questions:

1. Which companies are likely to outsource their logistics activities?
2. Who makes a logistics outsourcing decision and manages 3PLs?
3. Which logistics functions are likely to be outsourced?
4. Which terms (e.g., payment, duration, and conflict resolution) are included in the 3PL contracts?
5. What are the most important determinants for selecting 3PLs?
6. What are the most important benefits of logistics outsourcing?
7. Which performance metrics are most important to 3PL performance evaluation?
8. Which leading 3PL is considered to be the "best-in class" performer (benchmark)?

In the following sections, we provide a brief overview of the relevant literature pertaining to logistics outsourcing. Next, we present the research methodology and its rationale. Then, we summarize the outcomes of data analysis, while discussing key findings and implications of this research.

2 Literature review

Reflecting the growing popularity of logistics outsourcing and a subsequent growth of the 3PL industry, there exist an extensive body of the literature relating to logistics outsourcing including 3PL trends, extent of 3PL usage, 3PL benefits, 3PL benchmarks, and 3PL selection criteria [45, 64, 67]. In general, 3PL refers to a for-hire, independent service provider performing all or part of logistics activities for the buyer, the seller, and the manufacturer of raw materials, parts/components, goods in process, or finished products without taking the title of those goods (e.g., [43, 47, 86]). Sheffi [69] is one of the first to conceptualize 3PL services and project the emergence of the 3PL industry. Lieb and Randall [39] started their landmark study by examining the extent to which the US manufacturers used 3PL services, the specific areas of 3PL services that were frequently used, and the managerial benefits accrued from the use of 3PL services. This study was continued and extended by Lieb and Randall [40], Sink et al. [71], Lieb and Kopczak [36], Murphy and Poist [58], Lieb and Randall [41], Lieb and Miller [38], Lieb and Kendrick [34, 35], and Lieb and Bentz [32, 33] who examined the extent of 3PL usage, 3PL market trends, and the prospects of the 3PL industry from the perspectives of 3PL chief executive officers (CEOs) and selected users for the last decade. Following suit, Knemeyer and Murphy [27] and Sahay and Mohan [65] investigated the impact of 3PL relationships on 3PL selection, contractual arrangements, and extent of its usage. These studies, however, primarily focused on the 3PL industry in the United States and did not recognize the emergence of the 3PL industry in foreign markets. In response to the need for global 3PL studies, Lieb et al. [37] conducted an empirical analysis to compare the status of the US 3PL industry with that of the European 3PL industry. Lieb and Kopczak [36] also examined how US 3PLs established their foothold in the European market. To better understand the dynamics of emerging 3PL markets in a particular foreign country, Dapiran et al. [13] investigated the extent of 3PL usage in Australia. Similarly, Bhatnagar et al. [11] zeroed in on 3PL opportunities in

Singapore, while Sohail et al. [74] looked into the burgeoning Sub-Saharan African market that was often overlooked by many 3PLs. Also, Jaafar and Rafiq [22] studied the prevalent practices and trends of the 3PL industry in the United Kingdom. Other similar studies focusing on the particular country's regional 3PL markets include the following: logistics outsourcing practices in Mexico [6], New Zealand [61], Australia and New Zealand [56], China [20, 21, 86], Korea [24], India (Sahay and Mohan [65]), Saudi Arabia [72], United Arab Emirates [73], Denmark [30], and Turkey [3].

However, a vast majority of these prior studies did not develop a benchmark of 3PL performance standards, which is critical to sustaining the growth of the 3PL industry on a global scale. Recognizing this deficiency, Min and Joo [52] attempted to measure the performance of selected 3PLs and then developed a benchmark standard using data envelopment analysis (DEA). Generally, DEA is referred to as a nonparametric linear programming technique that converts multiple incommensurable inputs and outputs of each decision-making unit (DMU) into a scalar measure of operational efficiency, relative to its competing DMUs [55]. Similar attempts were made by Zhou et al. [86], Min and Joo [54], and Min et al. [55]. Despite numerous merits, most of the prior 3PL studies primarily focused on the specific demands, needs, and types of logistics outsourcing practices without looking into the 3PL user's outsourcing decision rationales, contractual terms, 3PL selection criteria, value propositions, and performance metrics which will be the important basis for 3PL benchmarking. To fill a significant void in 3PL knowledge bases, this paper conducts an exploratory study of US firms that can increase the understanding of their outsourcing decision rationales, contractual issues, value propositions, and performance metrics, while identifying best-in class practices and then developing winning logistics outsourcing strategy.

3 Research methodology

To address a number of research questions raised earlier, we conducted an exploratory study via mail questionnaire surveys targeting primarily US firms outsourcing at least a certain portion of their logistics services. Given a number of "what" and "which" research questions, an exploratory study is justified and favored over other research methodologies such as focus group interviews, which tends to reflect subjective opinions of a small group (see, e.g., Yin [84] for a rationale for an exploratory study). In contrast to statistical techniques aimed at testing specific hypotheses, an exploratory study aims to understand data when little or no statistical hypotheses exist, or when specific hypotheses exist, but supplemental representations are needed to ensure the interpretability of statistical results [9]. In this way, an exploratory study seeks to answer the broad research questions of "what is going on in today's 3PL industry" and "what are the emerging logistics outsourcing practices in this changing business environments."

A six-page questionnaire was mailed in late September of 2011 to 200 randomly selected US firms listed in (1) the 2011 Council of Supply Chain Management Professionals (CSCMP) Member Directory and (2) the Institute for Supply Management (ISM) membership directory. The typical respondent to the questionnaire held the title of President/CEO, Vice President, Director of Supply Chain Management, Logistics, Operations, or Purchasing. The survey instrument was developed from a review of the literature (e.g., [25, 28, 33, 35, 38]) dealing with 3PL issues and focus group interviews with two 3PLs (UPS Supply Chain Solutions and Northern Continental Logistics) and three 3PL users (Ford, General Electric, and Lexmark International) who had been utilizing 3PLs. The instrument was pre-tested with these representative groups and then later modified using their feedback. To increase variability in the data and generalizability of the survey results, the instrument was targeted for various sectors of industry utilizing the 3PL services (see Table 1). These industries included manufacturing (53.1 % of the responding firms), service providers including food and agricultural services, rental services, entertainment and tourism services (15.6 %), health care services (10.9 %), retail trade (4.7 %), government and defense (1.6 %), and others (14.1 %). To gauge the precision and reliability of the survey instrument, we calculated the Cronbach's coefficient alpha which reflected the homogeneity and internal consistency of the item scale. Cronbach's coefficient alpha usually provides a good measure of reliability because sampling of content is the major source of measurement error for statistical constructs. As summarized in Tables 2, 3, 4, 5, 6, 7, and 8, a reliability analysis of all the item scales yielded Cronbach's alphas ranging from .665 to .891, indicating sufficient homogeneity and consistency [60].

Of the 200 questionnaires, seven were returned as undeliverable and 64 valid responses were received. These responses produced a total response rate 32.5 %, which reached the targeted overall response rate of over 20 % for a valid assessment. For example, Malhotra and Grover [44] observed that a response rate over 20 % was needed for a positive assessment of mail survey results. However, a response rate below 20 % for a mail survey is not uncommon in the supply chain literature ([38]; Mentzer and Gandhi [48]; Mentzer et al. [49]; Min and Lambert [51]; Murphy and Daley [57]; Pedersen and Gary [63]; Singh et al. [70]; Wood and Nelson [83]). Low response rates are an ongoing concern in conducting

Table 1 Respondent profiles ($N = 64$ firms)

Company information	Percentage
Industry classification	
Manufacturing	52.3 %
Retail trade	4.6
Government and defense	1.5
Health care services	10.8
Service providers	15.4
Others	15.4
Total number of employees	
Less than 99	12.3 %
100–499	18.5
500–4,999	24.6
5,000 or larger	44.6
Total number of supply chain professionals who involved in sourcing, making, and delivery process of the supply chain operation	
0–5	27.0 %
6–10	11.1
11–25	11.1
26–49	12.7
50–99	12.7
100 or more	25.4
Annual sales	
Less than $50 million	16.9 %
$50 million–$99 million	6.2
$100 million–$499 million	20.0
$500 million–$999 million	12.3
$1 billion or more	44.6
Annual logistics expenditure	
Less than $500,000	24.2 %
$500,000–$999,999	11.3
$1 million–$4.99 million	9.7
$5 million–$9.99 million	3.2
$10 million–$19.99 million	4.8
$20 million–$49.99 million	6.5
$50 million–$99.99 million	6.5
$100 million or more	33.9
Annual outsourcing expenditure	
Less than $500,000	33.9 %
$500,000–$999,999	6.5
$1 million–$4.99 million	4.8
$5 million–$9.99 million	14.5
$10 million–$19.99 million	8.1
$20 million–$49.99 million	3.2
$50 million–$99.99 million	8.1
$100 million or more	21.0

mail surveys ([17]; Larson and Poist [31]). In general, for mail surveys, response rates in the neighborhood of 10–20 % are considered satisfactory [16, 85]. To detect any nonresponse bias, we used the extrapolation technique by separating the responses of early respondents from those of late respondents (i.e., responses after the cut-off date of November 30, 2011). The t test of these responses showed no statistically significant difference at $\alpha = .05$. So, there is no evidence of nonresponse bias (see, e.g., [80]).

Table 2 A list of most outsourced logistics services

Logistics services	Currently outsourced service[a]	Plan to outsource[a]	No need for that service[a]	Rank
Customs clearance/ brokerage	60.4 %	3.7 %	20.4 %	1
Port services	56.4	5.5	25.5	2
Freight bill audit and payment	47.4	2.6	2.6	3
Freight forwarding	45.5	5.5	14.5	4
Import/export documentation	40.0	1.8	14.5	5
Shipment consolidation/ in-transit merge	34.6	5.8	25.0	6
Shipment tracking/event management	33.9	8.9	7.1	7
Freight brokering	33.3	5.6	14.8	8
Security management	24.5	1.9	11.3	9
Inbound traffic control	20.0	0	14.5	10
e-logistics/ e-(online)purchasing	18.9	1.9	26.4	11
Product packaging/ labeling/marking	16.4	3.6	9.1	12
Outbound traffic control	16.4	3.6	14.5	13
Loss/damage claims management	14.8	3.7	9.3	14
Warehouse management	14.5	1.8	14.5	15
Returned good management	14.0	5.3	8.8	16
Carrier negotiation and contracting	10.9	0	9.1	17
Inventory management	10.7	1.8	10.9	18
Customer relationship management	5.4	1.8	10.7	19
Demand forecasting/ planning	3.6	3.6	3.6	20

Cronbach $\alpha = .882$

[a] Numbers represent a percentage of respondents

The questionnaire contained various questions related to the size (e.g., total number of employees and total number of supply chain professionals such as logistics managers, traffic managers, and buyers) and annual sales volume of the responding firms, individuals who get involved in the 3PL selection decisions, division(s) that is/are primarily responsible for managing logistics outsourcing services,

Table 3 The common forms of logistics outsourcing compensation

Compensation form	Average frequency of use	Ranks
Transaction-based fee	4.13 (1.266)	1
Flat-based fee	3.51 (1.318)	2
Cost plus transaction fee	2.70 (1.449)	3
Percentage-of-saving	1.84 (1.115)	4
Flat-fee plus gain sharing	1.56 (.978)	5
Gain sharing	1.54 (.917)	6

Numbers in parentheses are standard deviations

Scale: 5 = most frequently used; 4 = somewhat frequently used; 3 = occasionally used; 2 = rarely used; 1 = never used

Cronbach $\alpha = .665$

Table 4 The common forms of contract clauses included in the 3PL contract

Contract clauses	Average frequency of use	Ranks
Service standards and performance measures	4.28 (1.167)	1
Key performance metrics	4.07 (1.255)	2
Timeline requirements	3.89 (1.186)	3
Process for termination of contracts	3.61 (1.449)	4
Communication channel between the 3PL user and the provider	3.35 (1.382)	5
Procedures for conflict resolution	3.25 (1.283)	6
Penalties for nonperformance	3.11 (1.305)	7
Potential collaboration with other 3PLs	2.74 (1.213)	8
Gain sharing	1.96 (1.132)	9

Numbers in parentheses are standard deviations

Scale: 5 = most frequently used; 4 = somewhat frequently used; 3 = occasionally used; 2 = rarely used; 1 = never used

Cronbach $\alpha = .891$

the current status and/or future plans of utilizing logistics outsourcing services, 3PL payment terms, and 3PL contractual terms, including the duration of 3PL contracts, the relative importance of factors affecting 3PL selection, the relative significance of proven benefits of logistics outsourcing services, 3PL performance metrics, and service ratings of selected leading 3PLs. The questionnaire has 6–9 items scored on five-point Likert scales ranging from *never used* (1) to *most frequently used* (5) as well as 13 items scored on five-point Likert scales ranging from *not at all important* (1) to *extremely important* (5) or from *strongly disagree* (1) to *strongly agree* (5). The *Statistical Packages for Social Sciences* (*SPSS*) *for Windows* [75] was used to analyze the data collected from the sample.

More than half of the responding firms (56.9 %) reported an annual sales volume surpassing $500 million. More than two-thirds of the responding firms (69.2 %) had more than 500 employees; 87.7 percent had at least 100. This response implies that logistics outsourcing is still very common among the large firms. A majority (75.8 %) of the responding firms spent at least half million dollars a year for logistics operations. Also, approximately two-thirds

Table 5 Key performance metrics for 3PL services

Performance metrics	Degree of importance	Rank
Shipping accuracy	4.73 (.486)	1
On-time delivery	4.70 (.502)	2
Order accuracy	4.52 (.603)	3
Order fill rate	4.33 (.695)	4
Frequency of customer complaints	4.25 (.775)	5
Order cycle time (lead time)	4.18 (.690)	6
Invoicing/billing accuracy	4.09 (.734)	7
Cost to serve/cost of goods sold	4.07 (.843)	9
Responsiveness to inquiry	4.06 (.763)	8
Economic value-added (EVA)	3.89 (.861)	10
Cash-to-cash cycle time	3.85 (.940)	11
Inventory turns	3.69 (.979)	12
Asset turns	3.61 (.979)	13

Numbers in parentheses are standard deviations

Scale: 5 = extremely important; 4 = very important; 3 = moderately important; 2 = slightly unimportant; 1 = not at all important

Cronbach $\alpha = .831$

Table 6 Key determinants for selecting 3PLs

Determinants	Degree of importance	Rank
Consistent/reliable services	4.58 (.731)	1
Competitive prices or fees	4.36 (.663)	2
The provider's expertise	4.34 (.822)	3
The provider's reputation	4.21 (.767)	4
The provider's financial stability	4.20 (.805)	5
The provider's information technology support	3.98 (.827)	6
Past relationship with the provider	3.77 (1.053)	7
Flexibility for providing customized services	3.51 (.848)	8
Capability to act as a lead logistics provider	3.25 (1.142)	9
Global supply chain solutions and visibility	3.12 (1.181)	10
A broad range of value-added services for one-stop shopping	3.10 (1.054)	11
Focused/niche service capability	3.09 (1.049)	12
The provider's contract renewal rate	3.05 (.980)	13

Numbers in parentheses are standard deviations

Scale: 5 = extremely important; 4 = very important; 3 = moderately important; 2 = slightly unimportant; 1 = not at all important

Cronbach $\alpha = .789$

Table 7 3PL performance ratings

Key attributes	3PLs						
	Benchmark[1] (FedEx)	UPS	Ryder	CH Robinson	Menlo	Exel	Other
Consistent/reliable services	*4.48 (.847)*	4.38 (.711)	3.35 (.982)	2.95 (.759)	3.05 (.780)	3.38 (.921)	4.14 (.710)
Competitive prices or fees	3.88 (1.017)	*4.08 (.900)*	3.52 (1.082)	3.20 (.894)	3.21 (.976)	3.24 (.889)	3.86 (.941)
The provider's expertise	*4.32 (.873)*	4.26 (.795)	3.25 (.847)	3.00 (.667)	3.05 (.705)	3.24 (.944)	4.05 (.785)
The provider's reputation	*4.43 (.813)*	4.30 (.853)	3.46 (1.103)	3.00 (.837)	3.10 (.788)	3.14 (.941)	3.91 (.868)
The provider's financial stability	4.34 (.938)	*4.45 (.760)*	3.22 (1.043)	3.40 (.821)	2.95 (.405)	3.10 (.700)	4.27 (.767)
The provider's information technology support	*4.47 (.797)*	4.34 (.708)	3.09 (.049)	3.20 (.768)	3.21 (.535)	3.29 (.784)	4.05 (.805)
Flexibility for providing customized services	3.77 (.931)	*3.84 (.916)*	3.09 (.668)	3.05 (.605)	3.00 (.745)	3.10 (.831)	3.08 (.941)
Capability to act as a lead logistics provider	*4.18 (.896)*	4.16 (.789)	3.09 (.971)	3.05 (.686)	3.05 (.848)	3.29 (.845)	3.60 (.941)
Global supply chain solutions and visibility	4.23 (.931)	*4.28 (.826)*	2.96 (.706)	2.95 (.359)	3.00 (.943)	3.24 (.944)	3.32 (.945)
A broad range of value-added services for one-stop shopping	4.07 (.959)	*4.13 (.822)*	3.13 (.797)	2.95 (.498)	3.05 (.394)	3.09 (.684)	3.55 (.596)
Focused/niche service capability	*3.61 (.974)*	3.56 (.940)	3.04 (.928)	3.10 (.641)	2.89 (.809)	3.33 (.1017)	3.53 (.964)

Numbers in parentheses are standard deviations

Italicized values indicate the best performance rating among the 3PLs under evaluation

Performance rating: 5 = excellent; 4 = good; 3 = neutral; 2 = poor; 1 = very poor

Table 8 Key benefits of logistics outsourcing services

Benefits	Extent of agreement	Rank
Improved overall customer services	4.00 (.707)	1
Great leverage for rate negotiation	3.93 (.806)	2
Timely invoicing	3.75 (.720)	3
Timely communication with customers	3.73 (.757)	4
Reduction in order cycle time	3.66 (.785)	5
Improved accuracy of invoicing	3.64 (.699)	6
Timely payment	3.61 (.679)	7
Reduction in employee bases	3.53 (.883)	8
Reduction in billing error	3.51 (.826)	9
Improved accuracy of quotations	3.46 (.785)	10
Faster resolution of billing issues	3.29 (.786)	11
Improved credit rating	3.25 (.720)	12

Numbers in parentheses are standard deviations

Scale: 5 = strongly agree; 4 = agree; 3 = neutral; 2 = disagree; 1 = strongly disagree

Cronbach $\alpha = .847$

(66.1 %) of the responding firms spent at least half million dollars for logistics-related outsourcing services. This fact indicates that a majority of the responding firms were actively involved in logistics outsourcing activities and seemed to be familiar with logistic outsourcing operations and their managerial implications. A majority (77.5 %) of the respondents indicate that an individual at the vice president level of the company typically approved the 3PL selection decision, while logistics/traffic managers typically recommended a particular 3PL or 3PLs.

4 Data analysis and findings

The results of the survey and its data analysis revealed some important patterns of logistics outsourcing services. These patterns include the following: the popularity of frequently outsourced or inhoused logistics services, payment terms, contractual terms, contract duration, 3PL selection criteria, expected benefits of 3PL services, performance metrics, and perceived service performances of leading 3PLs. In the following subsections, we will elaborate on these patterns and their potential implications from both 3PL users and service providers' perspectives.

4.1 Common targets for logistics outsourcing

Since logistics activities typically involve a large commitment of capital and human resources, a decision to outsource certain aspects of logistics activities has a very important financial implication. Also, since logistics efficiency directly affects the level of customer services, logistics outsourcing has an important service implication. Considering these managerial implications, a logistics outsourcing decision starts with the identification of

specific logistics functions that can be targeted for potential outsourcing. Such a decision may hinge on the outsourcer (3PL user)'s core competency, the routine/repetitive nature of logistics functions, and the extent of customer needs for those functions. With that in mind, the respondents were asked to categorize specific logistics functions/services that have been outsourced (or in-housed) and need (or need not) to be outsourced in the future. The five most frequently outsourced logistics services were as follows: (1) customs clearance/brokerage; (2) port services such as transfer loading, inland routing, cargo insurance, export licensing, and inbound deconsolidation; (3) freight bill audit and payment; (4) freight forwarding; (5) import/export documentation (see Table 2).

From the above, it is apparent that three out of five most frequently outsourced logistics services are tied to global logistics operations. This finding is somewhat congruent with that of the 15th annual study of 3PLs [28], which showed the popularity of international transportation and customs brokerage as the outsourcing targets. Whereas most prior 3PL studies [28, 29, 33, 39] rarely listed port services and import/export documentation as the potential outsourcing targets, the outsourcing needs for those services will be increased as the globalization of business activities and the subsequent international trade begin to accelerate in the future. On the other hand, demand forecasting/planning, customer relationship management (CRM), and inventory management turned out to be the three least popular targets for outsourcing. Given the strategic importance of demand forecasting/planning to customer service that affects the company's competitiveness and bottom line, many outsourcers might have perceived it as their core competency and thus wanted to keep it in-house. Also, since demand forecasting/planning requires the past sales history data that are often regarded as the company's proprietary information, many outsourcers might have felt uncomfortable releasing such sensitive information to their 3PLs. For similar reasons, CRM is another less frequently outsourced service. Herein, CRM is referred to as the business practice that is intended to improve service delivery, build social bonds with customers, and secure customer loyalty by nurturing a long-term, mutually beneficial relationship with valued customers selected from a pool of more than a few customers [53]. As such, CRM necessitates direct customer interactions that are typically handled by the company's own employees rather than outsiders (i.e., 3PLs). Another reason why CRM was not frequently outsourced may be a great deal of confusion regarding what CRM constitutes and what role it plays in enhancing logistics efficiency (Payne and Frow [62]).

4.2 Logistics outsourcing compensation

Considering the direct impact of cost of outsourcing on the company's bottom line, 3PL users should carefully select the most desirable payment terms for 3PL services. There is a wide spectrum of payment terms (compensation forms) that the 3PL users can choose from. These include the following: transaction-based pricing (fee for service), cost-based pricing, flat charges, and performance-based pricing (e.g., gain sharing). The selection of these terms may depend on the degree to which costs are fixed or variable, transaction volume fluctuations, 3PL contract durations, 3PL market conditions (level of competition), and business outcomes/service performances. When the respondents were asked to indicate their most frequently used payment terms, a transaction-based fee was the overwhelming favorite form of the compensation. Generally, a transaction-based fee is a fee charged by the 3PL based on the (dollar) volume of transaction in a billing period. This fee can be assessed as per invoice processed or per executed order, without a large amount of upfront charges for 3PL services. With a difficulty in measuring the true cost of 3PL services and developing 3PL service performance metrics, a transaction-based fee structure seems to be a less risky option for the 3PL user. Also, since it is not strictly based on the performance outcome, a transaction-based fee poses less risk to the 3PLs than the outcome or incentive-based pricing such as percentage-of-saving and gain sharing. This explains why the use of a transaction-based fee structure is most common for 3PL compensation deals. On the other hand, gain sharing is rarely used despite its potential in enhancing overall logistics productivity in the long run. A lack of its popularity may have something to do with the difficulty in developing quantifiable performance metrics/benchmarks and specifying payouts to perceived gains. Also, gain sharing can increase the level of stress for 3PLs whose financial stake is dependent upon their performance outcomes. As such, 3PLs will be reluctant to agree on the gain sharing term with their users.

4.3 Common contractual clauses

3PL contractual terms specify a legal obligation (e.g., duties and rights) of two parties (i.e., the 3PL and its users) involved in logistics outsourcing. Without them, if the 3PL is underperforming, there is little or no recourse for contract disputes. To avoid potential contract disputes and outsourcing failures, the 3PL users should determine which provisions are considered essential for 3PL contractual terms. These essential provisions were identified based on the frequency of inclusion in the contract clauses indicated by the respondents. According to our survey, contract

clauses that are among the most commonly included are as follows: (1) service standards and performance measures; (2) key performance metrics; (3) timeline requirements. This survey result clearly indicates that the 3PL performance benchmarks and metrics matter most to both the 3PL and its user. That is to say, the establishment of clearly defined and measurable outcomes should precede the contractual agreement between the 3PL and its user. With that in mind, the respondents were asked to indicate the importance ratings of KPIs or metrics which were often suggested by the supply chain operations reference (SCOR®) model (e.g., [12]). These important ratings were one of the most straightforward but effective ways of gauging the relative importance of performance metrics to 3PL service standards. They also help the 3PL users identify specific provisions to be included in the service level agreement (SLA). As summarized in Table 5, the metric considered most important in setting the 3PL service standards is shipping accuracy. The next four most important metrics were on-time delivery, order accuracy, order fill rate, and frequency of customer complaints.

On the other hand, asset turns, inventory turns, and cash-to-cash cycle time were considered relatively unimportant. This finding may be due to the fact that 3PL users are more interested in higher-order fill rates with higher levels of inventory than a simple reduction in inventory carrying costs or cost savings resulting from the better utilization of assets.

4.4 3PL selection criteria

Considering the sheer number and diversity (e.g., asset-based vs. non-asset based, transportation-based vs. warehousing based, integrator vs. role player) of 3PLs, selecting a right 3PL is an onerous task. Although the selection criteria may differ from one 3PL user (shipper) to another, they often include the following: price, service quality, reliability, flexibility, and competence [2, 77]. Also, the relative importance of these criteria to the 3PL selection decision may vary from one contract period to next and is often influenced by the 3PL user's service needs, financial status, product lines, geographical coverage, business scope, and organizational culture. When being asked to identify key determinants and then indicate their relative importance to the 3PL selection, the respondents listed the 3PL's consistent/reliable services, prices/fees, expertise, reputation, and financial stability as the five most important factors for 3PL selection (see Table 6). As compared to the results of earlier studies on 3PL selection [1, 2, 46], the relative importance of prices to 3PL selection seems to be increasing over the years. This trend seems to reflect the 3PL user's increased cost pressure resulting from prolonged financial crisis throughout the world. For a similar reason, the financial stability of the 3PL became one of the five most important factors for 3PL selection. On the other hand, the 3PL's focused/niche service capability and contract renewal rate were considered relatively unimportant for 3PL selection.

Considering the presence of hundreds of 3PLs in the United States, it would be nearly impossible to compare the services performances of all the existing 3PLs. Thus, our benchmarking efforts focused on six selected 3PLs that were consistently on the list of top-ten 3PLs in North America recognized by the annual Inbound Logistics magazine surveys conducted for the last several years [18]. To evaluate the service performances of six leading 3PLs in the United States with respect to aforementioned 3PL selection criteria and then identify the best performer (benchmark) among those six 3PLs, we asked respondents to rate the performances of the six leading 3PLs on a five-point Likert scale (5 = excellent, 1 = very poor) as well as other 3PLs (e.g., Kuhene and Nagel, Schneider Logistics, Expediters, DSC Logistics, Unyson Logistics, BDP International) that are not among the selected six 3PLs, but were used by the responding firms. Our survey results summarized in Table 7 showed that both FedEx and UPS received the largest number of the highest performance ratings for each 3PL selection category and thus are considered to be potential benchmarks. Specifically, FedEx scored the highest for six categories, while UPS scored the highest for five categories. In particular, FedEx turns out to be the best performer in terms of consistent/reliable services, expertise, word-of-mouth reputation, IT support, and its role as the lead logistics service provider, while UPS leads other 3PLs with respect to its competitive prices/fees, financial stability, global supply chain solutions, and a broad range of value-added services. However, neither FedEx nor UPS scored high for its flexibility for customized services and focused/niche service capability. In fact, none of the leading 3PLs did not seem to meet the service expectations of 3PL users with respect to flexibility and focused/niche capability, since all 3PLs registered the performance ratings below 4 (good) for those two categories. Also, notice that all but UPS scored lower than 4 for a competitive pricing category. This finding implies that 3PL users did not feel they received a good bargain from most 3PLs. Judging from these findings, 3PLs should gear their efforts to enhance their capability by offering more customized services, developing a niche market, and offering more bang for the buck.

4.5 Logistics outsourcing benefits

Since logistics outsourcing frees up the company's key resources such as cash, personnel, equipment, and time, it

is increasingly seen as an important strategic move, which has become more of a norm than an option in this competitive business environments. Its key value often lies in cost saving opportunities because outsourcing often increases operational efficiency through the reduction of investments in noncritical assets and the concentration of resources in the company's core competency [66, 78]. However, considering the increased role of logistics in supply chain operations as the primary value-adding activity and major differentiator, the benefit potentials of logistics outsourcing transcend cost saving. To realize the various benefits of logistics outsourcing and then gain better insight into the true motivation behind logistics outsourcing, the respondents were asked to indicate their perceived benefits of logistics outsourcing on a five-point Likert scale (5 = strongly agree, 1 = strongly disagree). As summarized in Table 8, the four most common benefits are as follows: (1) improved overall customer services; (2) great leverage for rate negotiation; (3) timely invoicing; and (4) timely communication with customers. The possible explanation for this finding is that logistics outsourcing frees the outsourcer (3PL user) from having to manage noncore functions such as back-office administrative functions or more routine logistics activities (e.g., freight rate negotiation) and thus allows the outsourcer to focus on front-office services such as direct customer interactions and communication with its customers. On the other hand, the survey result indicates that logistics outsourcing did not necessarily help the outsourcer improve its credit rating, resolve billing issues, and reduce billing error. Also, defying the common sense, logistics outsourcing did not necessarily help the outsourcer to reduce its employee base despite the fact that human resources associated with outsourced logistics functions were hired and managed by the 3PL.

5 Conclusions and study implications

This section summarizes key findings of our logistics outsourcing study and their practical implications for both 3PLs and their clients who would like to leverage their logistics operations as their competitive differentiators in an era of austerity and financial crisis.

In today's mature 3PL market, mere compliance with past service standards will not result in the level of improvement necessary to become the "best-of-breed" 3PL. In other words, 3PLs need to achieve service excellence by constantly improving service performances. 3PLs cannot improve service performances unless they understand what kind of logistics services their clients really want and what kind of discrepancies exists between current service offerings and actual client needs. They also need to cater their service offerings to the changing preferences and needs of their clients in the constantly evolving 3PL market. Furthermore, 3PLs may want to know what their leading competitors are doing and what level of competitive gaps exist between their current service performances and the best-in class practices. This section summarizes several major findings of the current study as compared to the prior 3PL studies, expounds both managerial and theoretical implications of those findings, and develops logistics outsourcing strategies.

First, we discovered that most frequently outsourced logistics services are those that are related to global logistics operations. These include customs clearance/brokerage, port services, and import/export documentation. Also, somewhat congruent with earlier studies conducted by Min [50] and Langley Jr and Capgemini [28], more transactional, operational, and routine logistics services such as freight bill audit and payment and freight forwarding are frequently outsourced. On the other hand, logistics activities, which may deal with more confidential information such as demand forecasting/planning, are seldom outsourced. Also, frontline services that require more direct contact with end customers such as customer relationship management (CRM) are rarely outsourced. Based on these findings, 3PLs need to build their expertise in handling global logistics operations and increase service offerings that fit into global transactions. Along this line, the relevant strategy may be used to enhance the 3PL's capability to understand country-specific customs procedures, map port processes regarding the way port traffics are handled and resources (e.g., longshoremen) are used, and identify touch points throughout the import/export procedures for necessary documentation requirements. For instance, the 3PL may offer unique port service offerings involving vessel berthing, container feeder services, and inland transfers/routing, while developing global IT capability such as global trade management solutions (GTMS), which can automate business processes for import/export, shipment booking, shipment visibility, contract management, and global trade arrangements. Also, from a standpoint of the network theory, outsourcing port services provide the 3PL user with an opportunity to exploit the 3PL's expertise in dealing with complex port logistics process and documentation requirements.

Second, the most common form of logistics outsourcing compensation is a transaction-based fee. In this output-based compensation scheme, 3PLs are paid based on the number of transactions executed rather than fixed fee arrangements or upfront fees based on the estimated amount of work. The popularity of a transaction-based fee may stem from the fact that the 3PL users do not have to incur a large amount of fixed costs, because they can only pay for a certain set of services that they use on an as-

needed basis. In other words, the 3PL users only need to pay for variable cost components and thus avoid paying for unused services. This scheme also helps 3PLs spread their investment expenditures in their infrastructure, personnel, and equipment by offering similar standardized logistics services to other clients. Therefore, a transaction-based compensation scheme creates "win–win" situations for both the 3PLs and their clients. Though flexible and scalable, a transaction-based fee scheme does not necessarily incorporate performance incentives into payment terms. Nevertheless, pay-on-performance schemes such as compensations based on gain sharing and percentage-of-saving are still rarely used in logistics outsourcing.

Third, when selecting a 3PL, consistent/reliable services turned out to be the most important determinant. As a gauge of service consistency/reliability, performance metrics such as shipping accuracy, on-time delivery, and order fill rate are considered as very important. The importance of service consistency/reliability is followed by competitive prices/fees. This finding indicates that the potential 3PL users are still looking for a bargain or any cost-cutting opportunity. Indeed, the recent 3PL survey conducted by Eyefortransport and MercuryGate International [15] listed cost control as one of the two most important challenges for 3PL users. The increased significance of competitive prices/fees may reflect the tight budgetary constraints of many 3PL users who became more conservative in spending their business expenditures in times of financial crisis. Also, it is intriguing to note that the 3PL's reputation matters for its selection. This finding implies that good branding may have a lasting impact on the 3PL client's loyalty to a particular 3PL. Thus, we recommend that the 3PL should develop a long-term branding strategy to prevent service failures and foster its nice images. Such a strategy may include the following: more customization of service offerings geared toward the needs of loyal clients, special discounts for renewed contracts, and quick attention to service failures (e.g., client complaints). On the other hand, it is somewhat surprising to find that the focused/niche service capability was considered as one of the least important determinants for selecting the 3PL. This result indicates that one of the effective ways to attract 3PL clients is to sustain a high level of services that can consistently meet the 3PL client's service standards rather than simply using the focused/niche service offering as a selling point. Perhaps, the benchmark set by FedEx can be a measuring yardstick that other 3PLs may use to close their competitive gaps.

Finally, as shown in Fig. 1, nearly three-fourth (73 %) of 3PL contracts did not last more than 3 years. The most typical duration of the 3PL contract is 1–3 years. This relatively short duration of the 3PL contract indicates the 3PL user's reluctance to take a long-term commitment to a particular 3PL with a potential financial risk in times of economic uncertainty. It also puts more pressure on the 3PL to show instant results and make it difficult to recover from start-up investment in infrastructure, equipment, and personnel.

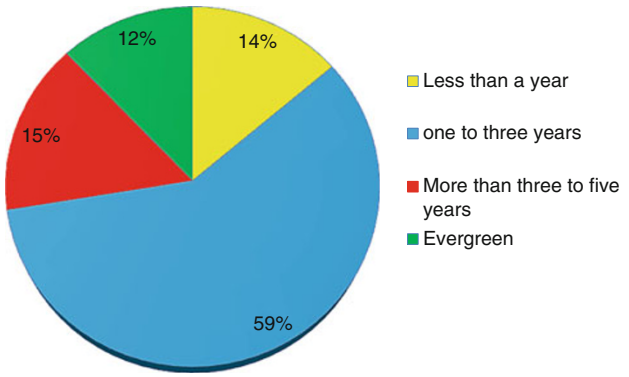

Fig. 1 The duration of the 3PL contract

As summarized above, this study attempted to understand what 3PL users typically outsourced (or which logistics function should be kept in-house from a standpoint of transaction theory), how they made payments for 3PL services, how they selected 3PLs, which metrics they used in measuring 3PL performances, and which benefits 3PL users gained, while identifying best-in class 3PLs with respect to their service attributes as part of the 3PL benchmarking process. From a practical standpoint, this study is one of the first that investigates what clauses should be included in the 3PL contracts, which performance metrics are relevant to 3PL evaluation, and how 3PL services are compensated. From a theoretical standpoint, this paper attempts to pinpoint how 3PLs can create valuable, rare, inimitable, and non-substitutable resources to enhance their competitive position based on the resource-based view (RBV) theory [81]. Through our survey findings, those resources may include 3PL's ability to offer unique and more demanding service offerings and its adaptability to more globalized business environments. Also, this paper built a conceptual foundation for more systematic 3PL benchmarking by identifying critical success factors (e.g., reliability/consistency, flexibility) as well as specific 3PL performance metrics and their relative priority.

Although the current study aims to evaluate the comparative service performances of the selected leading 3PLs in the United States, it can be extended to include large samples across the United States. Similarly, this study can be extended to include samples from different countries and then conduct cross-cultural studies to examine any cross-cultural differences in the logistics outsourcing practices and the 3PL client perception of 3PL service quality. In addition, future studies can be directed toward the identification of various latent variables (e.g., 3PL'

size, industry bases, logistics budget, years of logistics outsourcing experiences) that may influence the 3PL selection and the perception of 3PL service performances using the confirmatory analysis.

References

1. Aghazadeh SM (2003) How to choose an effective third party logistics provider? Manag Res News 26(7):50–58
2. Aguezzol A (2007) The third party logistics selection: a review of literature. In: Proceedings of international logistics and supply chain congress, November 8–9. Istanbul, Turkey, pp 1–7
3. Aktas A, Ulengin F (2005) Outsourcing logistics activities in Turkey. J Enterp Inf Manag 18(3):316–329
4. Alibaba.com (2010) Logistics outsourcing has become the general trend of economic globalization. http://resources.alibaba.com/topic/800029260/Logistics_outsourcing_has_become_the_general_trend_of_economic_globalization.htm. Retrieved on March 27, 2011
5. Ansari A, Modarress B (2010) Challenges of outsourcing logistics to third-party providers. Int J Logist Syst Manag 7(2):198–218
6. Arroyo P, Gaytan J, de Boer L (2006) A survey of third-party logistics in Mexico and a comparison with reports on Europe and USA. Int J Oper Prod Manag 26(6):639–667
7. Bardi EJ, Tracey M (1991) Transportation outsourcing: a survey of US practices. Int J Phys Distrib Logist Manag 21(3):15–21
8. Bask AH (2001) Relationships between 3PL providers and members of supply chains—a strategic perspective. J Bus Ind Mark 16(6):470–486
9. Behrens JT, Yu CH (2003) Handbook of psychology. Wiley, Hoboken, NJ
10. Bhatnagar R, Viswanathan S (2000) Re-engineering global supply chains: alliances between manufacturing and global logistics service providers. Int J Phys Distrib Logist Manag 30(1):13–34
11. Bhatnagar R, Sohal A, Millen RA (1999) Third party logistics services: a Singapore perspective. Int J Phys Distrib Logist Manag 29(9):569–587
12. Bosstorff P, Rosenbaum RG (2007) Supply chain excellence: a handbook for dramatic improvement using the SCOR model. AMACOM, New York, NY
13. Dapiran P, Lieb RC, Millen R, Sohal A (1996) Third party logistics services usage by large Australian firms. Int J Phys Distrib Logist Manag 26(10):36–45
14. Eckler J (2010) Why we need to re-invent logistics outsourcing. Wareh Forum 25(11):1–3
15. Eyefortransport and MercuryGate International (2011) Global 3PL and outsourcing logistics strategy. Presented at the 3PL summit and chief supply chain officer forum. Atlanta, GA, June 21–23
16. George D, Mallery P (2001) SPSS for windows step by step: a simple guide and reference, 3rd edn. Ally and Bacon, Boston, MA
17. Greer TV, Chuchinprakarn V, Seshardri S (2000) Likelihood of participating in mail survey research. Ind Mark Manage 29(2):97–109
18. Harden C (2011) Readers' choice: Top 10 3PL excellence awards 2011. Inbound Logistics. http://www.inboundlogistics.com/cms/article/readers-choice-top-10-3pl-excellence-awards-2011/. Retrieved on July 26, 2011
19. Halldórsson Á, Skjøtt-Larsen T (2004) Developing logistics competencies through third party logistics relationships. Int J Oper Prod Manag 24(2):192–206
20. Hong J, Chin A, Lin B (2004) Logistics outsourcing by manufacturers in China: a survey of the industry. Transp J 43(1):17–25
21. Hong J, Chin A, Liu B (2004) Firm-specific characteristics and logistics outsourcing by Chinese manufacturers. Asia Pac J Mark Logist 16(3):23–36
22. Jaarfar HS, Rafiq M (2005) Logistics outsourcing practices in the UK: a survey. Int J Logist Res Appl 8(4):299–312
23. Johansson J, Mattsson LG (1986) Interorganizational relations in industrial systems: a network approach compared with the transaction cost approach. Int Stud Manag Organ 1(17):34–48
24. Kim JI (1996) Logistics in Korea: current state and future directions. Int J Phys Distrib Logist Manag 26(10):6–21
25. Knemeyer AM, Corsi TM, Murphy PR (2003) Logistics outsourcing relationships: customer perspectives. J Bus Logist 24(1):77–109
26. Knemeyer AM, Murphy PR (2004) Evaluating the performance of third-party logistics arrangements: a relationship marketing perspective. J Supply Chain Manag 40(1):35–51
27. Knemeyer AM, Murphy PR (2005) Exploring the potential impact of relationship characteristics and customer attributes on the outcomes of third-party logistics arrangements. Transp J 44(1):5–19
28. Langley CJ Jr, Capgemini (2011) 15th Annual 2011 third-party logistics survey. Unpublished white paper. Capgemini Consulting, Atlanta, GA
29. Langley CJ Jr, Capgemini (2012) 16th Annual 2012 third-party logistics survey. Unpublished white paper. Capgemini Consulting, Atlanta, GA
30. Larson PD, Gammelgaard B (2001) Logistics in Denmark: a survey of the industry. Int J Logist Res Appl 4(2):191–206
31. Larson PD, Poist RF (2004) Improving response rates to mail surveys: a research note. Transp J 43(4):67–74
32. Lieb RC, Bentz BA (2004) The use of third-party logistics services by large manufacturers: the 2003 survey. Transp J 43(3):24–33
33. Lieb RC, Bentz BA (2005) The use of third-party logistics services by large manufacturers: the 2004 survey. Transp J 44(2):5–15
34. Lieb RC, Kendrick S (2002) The use of third party logistics services by large American manufacturers: the 2002 survey. Supply Chain Forum An Int J 3(2):2–10
35. Lieb RC, Kendrick S (2003) The year 2002 survey: CEO perspectives on the current status and future prospects of the third-party logistics industry in the United States. Transp J 42(3):5–16
36. Lieb RC, Kopczak L (1997) A CEO perspective: the state of US logistics companies in Europe. Supply Chain Manag Rev 1(2):34
37. Lieb RC, Millen RA, Van Wassenhove LN (1993) Third party logistics services: a comparison of experienced American and European manufacturers. Int J Phys Distrib Logist Manag 23(6):35–44
38. Lieb RC, Miller J (2002) The use of third-party logistics services by large American manufacturers, the 2000 survey. Int J Logist Res Appl 5(1):1–12
39. Lieb RC, Randall HL (1992) The use of third-party logistics services by large American manufacturers. J Bus Logist 13(2):29–42
40. Lieb RC, Randall HL (1996) A comparison of the use of third-party logistics services by large American manufacturers, 1991, 1994, and 1995. J Bus Logist 17(1):305–320
41. Lieb RC, Randall HL (1999) 1997 CEO perspectives on the current and future prospects of the 3PL industry in the US. Transp J 38(3):28–41
42. Lynch CF (2000) Logistics outsourcing: a management guide. Council of Logistics Management, Oak Brook, IL
43. Maltz AB, Ellram LM (2000) Selling inbound logistics services: understanding the buyer's perspective. J Bus Logist 21(2):69–88

44. Malhotra MJ, Grover V (1998) An assessment of survey research in POM: from constructs to theory. J Oper Manag 16(4):407–425
45. Marasco A (2008) Third-party logistics: a literature review. Int J Prod Econ 113(1):127–147
46. McGinnis MA, Kochunny CM, Ackerman KB (1995) Third party logistics choice. Int J Logist Manag 6(2):93–102
47. Menon MK, McGinnis MA, Ackerman KB (1998) Selection criteria for providers of third-party logistics services: an exploratory study. J Bus Logist 19(1):121–137
48. Mentzer JT, Gandhi N (1995) Microcomputers versus mainframes: use among logistics and marketing professionals. Int J Phys Distrib Logist Manag 25(4):80–92
49. Mentzer JT, Schuster CP, Roberts DJ (1990) Microcomputer versu mainframe usage in logistics. Logist Transp Rev 26(2):115–131
50. Min H (2002) Outsourcing freight bill auditing and payment services. Int J Logist Res Appl 5(2):197–211
51. Min H, Lambert T (2002) Truck driver shortage revisited. Transp J 42(2):5–16
52. Min H, Joo SJ (2006) Benchmarking the operational efficiency of major third-party logistics providers using data envelopment analysis. Supply Chain Manag Int J 11(3):259–265
53. Min H (2006) Developing the profiles of supermarket customers through data mining. Serv Ind J 26(7):1–17
54. Min H, Joo SJ (2009) Benchmarking third-party logistics providers using data envelopment analysis: an update. Benchmarking Int J 16(5):572–587
55. Min H, DeMond S, Joo S (2013) Evaluating the comparative managerial efficiency of leading third-party logistics providers in North America. Benchmarking Int J 20(2):212–232
56. Mollenkopf D, Dapiran GP (2005) World-class logistics: Australia and New Zealand. Int J Phys Distrib Logist Manag 35(1):63–74
57. Murphy PR, Daley JM (1994) A comparative analysis of port selection factors. Transp J 34(11):15–21
58. Murphy PR, Poist RE (1998) Third-party logistics usage: an assessment of propositions based on previous research. Transp J 27(4):26–35
59. Nelson RR, Winter SG (1982) An evolutionary theory of economic change. Belknap, Harvard, Cambridge
60. Nunnally JC, Bernstein IH (1994) Psychometric theory, 3rd edn. McGraw-Hill, New York, NY
61. Sankaran J, Mun D, Charman Z (2002) Effective logistics outsourcing in New Zealand: an inductive empirical investigation. Int J Phys Distrib Logist Manag 32(8):682–702
62. Payne A, Frow P (2006) A strategic framework for customer relationship management. J Mark 69(4):167–176
63. Pedersen EL, Gray R (1998) The transport selection criteria of Norwegian exporters. Int J Phy Distrib Logist Manag, 28(2):108–120
64. Razzaque MA, Sheng CC (1998) Outsourcing of logistics functions: a literature survey. Int J Phys Distrib Logist Manag 28(2):89–107
65. Sahay BS, Mohan R (2006) Managing 3PL relationships. Int J Integr Supply Manag 2(½):69–90
66. Sanders NR, Locke A (2005) Making sense of outsourcing. Supply Chain Manag Rev 9(2):38–45
67. Selviaridis K, Spring M (2007) Third party logistics: a literature review and research agenda. Int J Logist Manag 18(1):125–150
68. Skjoett-Larsen T (2000) Third party logistics—from an interorganizational point of view. Int J Phys Distrib Logist Manag 30(2):112–127
69. Sheffi Y (1990) Third party logistics: present and future prospects. J Bus Logist 11(2):27–39
70. Singh A, Narain R, Yadav RC (2006) Benchmarking and performance measurement of supply chain management practices: a survey of Indian organizations. Int J Serv Oper Manag 2(4):313–334
71. Sink HL, Langley CJ, Gibson BJ (1996) Buyer observations of the US third-party logistics market. Int J Phys Distrib Logist Manag 26(3):38–46
72. Sohail MS, Al-Abdali OS (2005) The usage of third party logistics in Saudi Arabia: current position and future prospects. Int J Phys Distrib Logist Manag 35(9/10):637–653
73. Sohail MS, Anwar SA, Chowdhury J, Farhat NR (2005) Logistics outsourcing in the United Arab Emirates: evidence and managerial implications. J Mark Channels 13(1):21–36
74. Sohail M, Sadiq A, Nathan K, Rushdi M (2004) The use of third-party logistics services: evidence from a Sub-Sahara African nation. Int J Logist Res Appl 7(1):45–57
75. SPSS (2012) IBM SPSS Statistics 21 edition. SPSS Inc, Chicago, IL
76. Stank TP, Goldsby TJ, Vickery SK, Savitskie K (2003) Logistics service performance: estimating its influence on market share. J Bus Logist 24(1):27–55
77. Sweeny E (2003) Purchasing logistics services: guidelines on selecting and managing the right 3PL. Logist Solut 6(5):34
78. The Outsourcing Institute Membership Database (1998) Survey of current and potential outsourcing end-user. http://www.outsourcing.com/content.asp?page=01b/articles/intelligence/oi_top_ten_survey.html. Retrieved on September 9, 2010
79. van Laarhoven P, Berglund M, Peters M (2000) Third-party logistics in Europe—five years later. Int J Phys Distrib Logist Manag 30(5):425–442
80. Wagner SM, Kemmerling R (2010) Handling nonresponse in logistics research. J Bus Logist 31(2):357–381
81. Wernerfelt B (1984) A resource-based view of the firm. Strateg Manag J 5(2):171–180
82. Williamson OE (1985) The economic institutions of capitalism: firms, markets, relational contracting. Free Press, New York, NY
83. Wood DF, Nelson RS (1999) Industrial transportation management: What's new? Transp J 39(9):26–30
84. Yin RK (2003) Case Study Research: Design and Methods, 3rd edn. Sage, Thousand Oaks, CA
85. Yu J, Cooper H (1983) A quantitative review of research design effects on response rates to questionnaires. J Mark Res 20(1):36–44
86. Zhou G, Min H, Xu C, Cao Z (2008) Evaluating the comparative efficiency of Chinese third-party logistics providers using data envelopment analysis. Int J Phys Distrib Logist Manag 38(4):262–279