



SELECTION CRITERIA AND PERFORMANCE MEASUREMENT OF THIRD-PARTY LOGISTICS

¹Tandir Dr. Nataša; ²Hadžiahmetović Dr. Nereida; ³Serdarić Mirelma

International Burch University, Sarajevo, Bosnia and Herzegovina

Abstract: Outsourcing logistics have an important strategy to make the organization more competitive. Companies, especially Small and Medium Enterprises (SMEs), use it to improve their to make plans, act, manage and control the products, services and information flow from the supplier to the customer. It enables faster penetration on the new markets, helps to reduce inventories and gain capacity expertise. Two elements of Third-Party Logistics (3PL) are addressed in this study: (1) selection criteria used in the 3PL selection process, (2) and perceived the performance of 3PLs from the perspective of service users. As the instrument for data collection, a questionnaire was distributed to the managerial staff of SMEs. The study compared the selection criteria of 3PL provider with the perceived performance of the third-party logistics provider. Analysis proved that there is a significant difference between the criteria and perceived value of price, quality, speed of delivery, responsiveness to unforeseen changes, reliable transportation, reliable warehousing, tailor-made service, a wide range of service, fast response to market changes, availability of top management and values good working relations. On the other side, there is no significant difference between the importance of criteria and perceived performance for the following parameter: equipment, reliable transportation, vehicles, financial stability, reputation, low operation costs, high assets turnover, strong international network, strong domestic network and the valuing of a long-term relationship. The study provides valuable information about the logistics market in Bosnia and Herzegovina, gives insight in the quality of the 3PL's services available on the market and quality of selection process performed by companies which use 3PL services. The research contributes to the future competitive strategy planning and the understanding of the way 3PL can contribute to corporate plans.

Keywords: Third-party logistics, small and medium enterprises, outsourcing, selection criteria, performance

1. Introduction

Organizational success is affected by effective logistics and supply chain management. Logistics is defined as the active process of the information movement, goods and raw materials in the company, movement inside the company and finally delivered to the consumers (Yeung, 2006).

Organizations invest in a relationship with partners and supply chain management in order to achieve high quality and efficient corporate chain management. Forty percent of logistics in total, on the global level, is outsourced to logistics. Increasing demand for 3PL partners is noticeable in



the world (Qureshi, Kumar, & Kumar, 2008). Logistics includes all activities that are occurring. The process starts when the decision to make the product is made, continues with the supply of materials needed for production, where production itself is a part of logistics, warehousing activities and delivery of the products to the final customer. (Yeung, 2006). 3PL or “logistics outsourcing” or in some cases “contract logistics”, was known in the last century, and have become popular in the last decade. (Man, 2006). 3PL is a bond between a customer and an outsourcing company. Compared to the ordinary logistics company, 3PL companies are offering services which are custom-made for their partners. In an outsourcing logistics, firms employ some external company which performs logistics activities. 3PL companies enhance efficiency and improve inventory management, and give the advantage of economies of scale to their partner, which is very powerful value-added service in the case of small and medium enterprises (SMEs) (Man, 2006). The research in the 3PL industry was conducted by many supply chain organizations, business researchers, logistics professionals, and academicians due to the valuable business information which can be provided to the many different industries (Leuschner, Carter, Goldsby, & Rogers, 2014). Moreover, research on 3PL were conducted in many countries which have well developed economies like United States of America, Taiwan, Netherlands etc. (Banomyong & Supatn, 2011; Gürçan, Yazıcı, Beyca, Arslan, & Eldemir, 2016; Min, 2013; Selviaridis, Spring, Profillidis, & Botzoris, 2008), and emerging markets and developing economies like Brazil, India and China. (Vidal Vieira & Fransoo, 2015; Wang & Cavusoglu, 2015). As it was cataloged by Leuschner et al. (2014), in the first meta-analytic

review of the impact of 3PL on firm performance in more than eight hundred sixty-four studies are written on the topic of outsourcing logistics. However, according to our best knowledge, there is no similar research conducted on SMEs in Bosnia and Herzegovina. This study aims to fulfill that gap. The purpose of this study is to investigate criteria used in the process of selection of 3PL partner and to measure the contribution of a 3PL partner to perceived organizational performance. Moreover, this research explores which criteria small and medium companies in Bosnia and Herzegovina perceive as the most important in the selection process of their 3PL partner. Criteria in the selection process differ from one company to another and it is influenced by many external and internal factors. Furthermore, the study measures the satisfaction of 3PL's service users. It also measures how users of 3PL's services perceive the performance of the 3PL partners. This study provides valuable information about logistics market in Bosnia and Herzegovina and gives a good insight in the quality of the 3PL services available on the market and quality of selection process performed by companies which choose to outsource 3PL services.

2. Theoretical Background

Logistics involves several activities. It encompasses the transfer of goods and services, storage of goods, the supply of materials, sharing of information, packaging of goods and recently added security. (Islam, Fabian Meier, Aditjandra, Zunder, & Pace, 2013).

The term 3PL is a synonym for logistics outsourcing, carriers, forwarding companies, transportation companies, logistics service providers (LSPs), and logistics service companies



(Forslund, 2012). 3PL or logistics outsourcing started to gain more attention in the first half of the 1990s when it became the focus of a large amount of research (Tibbetts, 2015). But it has grown rapidly since 2001 (Shi & Arthanari, 2011). Companies increase the efficiency and effectiveness of a logistics function by employing outsourcing companies which act as third-party service providers (Christopher, 1992). As outsourcing of logistics has received increasing attention from researchers and practitioners the number of definitions increased. Unlike most of the outsourcing services which usually cover one activity by an outside partner, 3PL providers cover several outsourcing activities such as purchasing, warehousing, and distribution of goods (Kang, Wu, Hong, & Park, 2012). There are several definitions of 3PL proposed by researchers. Murphy and Poist defined 3PL as a business relationship between a shipper and client company. The client company is the company which has a need to ship goods from one place to another and demand either basic logistics requirements fulfilled or more customized and turnkey logistics support (Murphy & Richard, 1998). Another definition of 3PL is the link between 3PL and supply chains. Within the supply chain, it is considered the relationship of the buyer, 3PL provider and the seller as mutually dependent and reliant upon each other for success and sustainment (Bask, 2001).

Defining the 3PL as a three mutually dependent relationship is adopted as a standard definition because the most of 3PL relationships were restricted to dependent relationships between the user of the services and the third-party providing the services (Marasco, 2008).

Logistics is an important part of a supply chain. Therefore, companies constantly work on the

enhancement of logistics management. Successful outsourcing of a 3PL can significantly enhance logistics performance and provide a competitive advantage (Hartmann & de Grahl, 2012). To gain a competitive advantage in a worldwide market, company managers are placing more focus on the improvement of supply chain management. To become more efficient, company managers hire 3PL partners to handle some or even all of logistics functions (Datta, Samantan, Sba Sankar, Gautam, & Gautam, 2013). Different types of functions and different levels of services provided by the various logistics service providers are outsourced by companies (Meidute, Litvinenko, & Aranskis, 2012). Moreover, Managers of small and medium companies are under pressure to stay competitive and because of that they mostly choose to outsource logistics services. It is one of the strategies which helps managers of small and medium enterprises maintain competitiveness. 3PL providers usually act as liaisons among suppliers and clients in supply chains (Masoud, 2016).

2.1.Third-Party Logistics Types

There are several different forms of 3PL. 3PL can belong to only one specific type or bleed into others. 3PL companies offer different types of logistics services or specialize in only one specific type. (Cerasis_IT, 2014)

Rao, Young, and Novick (1993) classified a 3PL provider according to the type of services. They classified 3PLs in five categories:

- Single services: 3PL provides only transportation or warehousing services.
- Separated services: 3PL provides either transportation or warehousing services.
- Integrated services: 3PL provides combined transportation or warehousing.



- Combined services: 3PL provide extra services on top of the equipment, warehousing, transportation functions such as administration and planning services.
- Complex combined services: 3PL provides the whole network of different services, such as planning, handling, warehousing, administration and information, and transportation functions.

2.2.Selection Criteria of Third-Party Logistics Companies

Metrics for evaluation of selection criteria of the 3PL provider are very important for companies. Results do not represent a real situation if a company use the same method in the evaluation of different types of providers. Criteria for the selection of different types of logistics provider differ from type to type (Perçin, 2009). In the literature, there are several selection criteria for 3PL providers based on companies' requirements (Gürçan et al., 2016). The most important point in the selection of a 3PL provider is to know which metrics need to be used. During the selection process, companies have to consider those selection criteria differ in different types of logistics service provider (Chen & Wu, 2011).

Bottani and Rizzi (2006) presented the five main steps in a selection process of 3PLs:

- 1) the need for outsourcing logistics is recognized,
- 2) the development of feasible alternatives by comparing the use of internal expertise, knowledge, experience of hiring outside expert and obtain professional logistics service,
- 3) the evaluation of candidates and selection of a service provider,
- 4) the implementation of services,

- 5) the service evaluation to control the performance, to select a new service provider or to enhance the relationship between the firm and the logistics service provider.

One single criterion may not be enough to identify potential 3PL provider, as well as a set of criteria used for one specific situation, may not be suitable for the other. The selection process may be costly, tedious and time-consuming so a model for the identification and classification of selection criteria, for 3PL services providers, is desirable to support logistics managers (Qureshi et al., 2008).

Criteria can be classified according to different characteristics. Qureshi et al. (2008) classified criteria used in the selection process of 3PL provider into three categories:

- (1) service quality,
- (2) organizational performance, and
- (3) relationship management.

Service quality

Zeithaml and Bitner (2003) stated that service quality reflects customer's perception of specific dimensions of service such as responsiveness, empathy, tangibles, and reliability. Logistics system quality is seen as the quality of the service. An ideal logistics partner has a well-defined quality program to satisfy the customers which will result in increased market share.

There are two dimensions of customer service quality: tangible and intangible. Tangible dimension includes the appearance of customer service personnel and facility whereas intangible dimension includes components such as the ability to provide accurate services, willingness to help customers, and provide knowledgeable service, as



well as attentiveness toward customers. Service quality is measured as a difference between expectations and perceptions of the services provided. (Man, 2006)

Organizational Performance

Organizational performance refers to the performance of the 3PL company. It encompasses the size and quality of fixed assets, operational performance, financial stability, reputation and all other traits of the organization itself.

Relationship Management

Relationship management refers to the management of bond between companies and the 3PL partner. Quality of management, trust, willingness to share information and develop long-term relationships are the characteristics of the relationship management.

2.3.Third-Party Logistics Performance

Most of the literature proposes that service performance is the most important criteria in a selection of 3PL. All criteria mentioned in a previous section may be used for performance measurement of 3PL as well. Performance refers to the quality of action that an organization takes out to achieve its principal missions and functions for the generation of profit.

Measurement of performance is not just an observation of past performance; it is a tool which helps in a realization of corporate aspirations and the assurance of a prosperous future. It is a metric that is used to quantify performance. Performance measurement is an analytical tool in the performance measurement process that records measures, displays results, and determines subsequent actions. A performance measurement system can be defined as the set of metrics used to

quantify both the efficiency and effectiveness of actions (Jothimani & Sarmah, 2014).

There are large numbers of methods and systems for performance measurements. Man (2006) in his work indicated some of the typical performance measurements methods. There are:

- Strategic Measurement Analysis and Reporting Technique System (SMART)
- Performance Measurement Questionnaire (PMQ)
- The Balanced Scorecard
- Strategic Performance Measurement System
- Integrated Dynamic Performance Measurement System (IDPMS)
- Holistic Process Performance Measurement System (PPMS)

Performance measurement is directly or indirectly affected by criteria since it is the criterion itself. When measuring the performance of 3PL provider or performance of the client company we are measuring the effectiveness of the criteria used in the selection process.

Table 1. shows some dependent and independent variables used in analyzed research papers. It can be noticed that performance, cost and company size in presented data are treated as independent variables. Performance variable is used against variables of service satisfaction, cost, sales growth, and gross profit margin. Online marketing capability was measured using IT capability.

Dependent variables of restricted timetable and vehicle availability were measured by an independent variable of company size. Relationship effectiveness is dependent on trust and commitment.



Table 1 Variables used in literature for performance measurement of 3PL provider

Year	Article	Sample Size	Dependent Variable	Independent Variable	Location
(2011)	R. Rajesh, S. Pugazhendhi, K. Ganesh, C. Muralidharan, R. Sathiamoorthy	181	Logistics cost reduction	Multimodal transportation	India
			Average order cycle length	Carrier selection	
			Client satisfaction	Freight consolidation	
(2011)	Dianne Hofenk, Rinaldo Schipper, Janjaap Semeijn, Cees Gelderman	77	Relationship effectiveness	Trust	Netherlands
			Relationship effectiveness	Commitment	
(2010)	Elten Briggs, Timothy D. Landry, Patricia J. Daugherty	109	Service satisfaction	Positional performance	USA
			Service satisfaction	Velocity performance	
(2011)	Chiung-Lin Liu, Andrew C. Lyons	92	Gross profit margin	Operational performance	Taiwan
			Sales growth	Operational performance	
(2015)	Jose Geraldo Vidal Viera, Jan C. Fransoo	119	Restricted timetable	Company size	Brazil
			Vehicle availability		
(2015)	Shan Wang, Hasan Cavusoglu	358	Online marking capability	IT capability	China
			Performance	Cost	
(2018)	Wenming Chung, Srinivas Talluri, Gyongyi Kovacs	58	Forecast error	Service level	USA
			Replenishment risk	Order-lead time	
(2015)	Baofengn Huo, Yuxiao Ye, Xiande Zhao	247	Opportunism	Company size	China
(2017)	Wenwen Zhu, Steohen C.H. Ng, Zhiqiang Wang, Xiande Zhao	250	Basic logistics outsourcing	Cost	China

2.4. Development of Logistics in Bosnia and Herzegovina

Logistics in Bosnia and Herzegovina has developed more or less the same as in the rest of the World. Looking back in the past 100 years of B&H three

significant periods can be extracted for the development of logistics in B&H. The first big change started in 1878 when Bosnia and



Herzegovina became a part of Austria-Hungary. Under the Austro-Hungarian rule, some special economic activities have begun to develop rapidly, for example, basic industry, mining, and forestry. It resulted in the development of the manufacturing sector and accelerated economic development. With the arrival of Austro-Hungary started the trend of accelerated urbanization, modernization, infrastructural development, water supply and general communal infrastructure (Đuderija, 2016). From 1945 B&H was the part of Socialist Federative Republic of Yugoslavia (SFRY), in the period of SFR Yugoslavia there were significant investments in the railways and roads, which were focused, like Austro-Hungary, on the export of natural resources and products of heavy industries, but this time to other republics of SFRY. Third significant period for the development of logistics started in 1995 and it still lasts. After the war period which lasted from 1992 until 1995, the period of renewal has started. Construction of modern highways, railways, and airports brought great improvements in the transportation industry.

Data in Table 2 show the importance of transportation and storage in the gross domestic product in B&H. In 2006, transportation and storage made up 3,32% of GDP. Then from 2007 to 2011, that percentage was less than in 2006 even though the revenue was constantly increasing. Percentage of transportation and storage in GDP increased from 3,38% in 2012 to 3,59% in 2016.

Table 2. Transportation and storage as a part of GDP in B&H

Year	GDP for B&H (000.000)	Transportation and storage (000)	%
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2006	20.057	663.488	3,31
2007	22.548	744.028	3,30
2008	25.519	839.535	3,29
2009	24.799	795.092	3,21
2010	25.364	822.967	3,24
2011	26.231	858.859	3,27
2012	26.223	887.218	3,38
2013	26.223	919.966	3,44
2014	27.359	990.356	3,62
2015	28.586	1.029.175	3,60
2016	29.900	1.073.525	3,59

One of the significant measures of the performance of logistics is the Logistics Performance Index (LPI). It is used for measuring the performance of the supply chains internationally. (The International Bank for Reconstruction and Development/The World Bank, 2016). Table 3 contains data regarding LPI for B&H, which are taken from the official publication of The World Bank. Research of the World Bank included 150 countries in 2007.

Table 3 Logistics Performance Index for Bosnia and Herzegovina

Bosnia and Herzegovina		
Year	Overall Logistics Performance Index (LPI)	
	Score	Rank
2007	2,46	88 (150)
2010	2,66	87 (155)
2012	2,99	55 (155)
2014	2,75	81 (160)
2016	2,60	97 (160)

Bosnia and Herzegovina have scored 2,46 points out of maximum 5, and it was on the 88th place out of



150. In 2010 there was not a significant change in score and rank, whereas in 2012 Bosnia and Herzegovina reached the best score of 2,99 and achieved the highest rank of 55th place. In 2014 Bosnia and Herzegovina scored 2,75 and achieved the rank of 81st place out of 160 countries in total. In 2016 Bosnia and Herzegovina achieved a fair score if we compare it with previous years, but it resulted in the worst rank among all five years.

Fluctuation in the ranks was not directly a consequence of the changes in a logistics quality, efficiency of customs, infrastructure, etc., it was more due to the changes in the scores of the other countries.

2.5. Research Question and Hypotheses

One of the most challenging decisions on the market is to be able to see the proper ratio between the price of the service and output. Every company which decides to use 3PL services will face the same problem. Selection of 3PL partners affects the company's business to a great extent and it makes quality important. Selection of suitable partner will affect the company's business in the long-term and represents the decision which is of the highest importance. The outcome depends on many factors and will differ from company to company. Both cost and quality are important. The study compares the selection criteria of 3PL provider and perceived the performance of 3PL. It is focused on the research question:

- Do the criteria of service quality used in a selection process fit with the perceived quality of the services of 3PL companies?

After the selection process of the 3PL provider has finished, companies adjust their business processes, make synchronization and cooperation start. Relationship between user and outsourcer is defined

by the contract, their powers, responsibilities, and duties to each other, customers and environment. Research focuses on outsourcer's satisfaction and aims to measure the performance of a 3PL provider from the perspective of the users. Study shows that criteria used during the selection process and perceived service quality are nearly the same. If the company's management has the higher criteria, it is expected to perceive the performance of the third-party provider as high or if the company's management has the low criteria, it is expected to perceive the performance of the third-party provider as low. Perceived quality of the services is measured from the perspective of the service users. Additionally, the study displays the connection between criteria and actual satisfaction with the performance of outsourcers. Previous literature showed that there is a significant correlation between those two, and companies which prioritize their criteria as quality, reliability, responsiveness should be more satisfied with the performance of 3PLs whereas companies whose priority is cost should show a lower level of satisfaction with 3PL's services. Moreover, research provides an analysis of the impact of the company's revenue on business decisions. Hypothesis 1a tested the influence of the company's revenue on the service quality criteria, whereas Hypothesis 1b tested the influence of the company's revenue on the criteria of organizational performance of the partner company. Companies usually tend to have strong long-term relationships with their external partner. The study examined the way the long-term relation influences the opinion of the service users about the performance of the 3PL partner. Hypothesis 2a tested the influence of the length of the services used on the perceived quality of the services. Hypothesis 2b tested the influence



of the length of the services used on the perceived organizational performance of the partner company. Finally, Hypothesis 2c tested the influence of the length of the services used on the perceived relationship management of the 3PL partner.

Methodology

Small and medium companies face many challenges which large companies usually do not have. They are more likely to have a lack of expertise and knowledge; frequently, they face a lack of financial resources. Inadequate systems of work and procedures can highly affect their efficiency (Masoud, 2016). Most often small and medium enterprises use the advantages of 3PL outsourcing, due to this reason this research is conducted in the Bosnian and Herzegovinian small and medium enterprises.

The purpose of this study is to empirically investigate criteria used in the process of selection of 3PL and measure perceived 3PL organizational performance in the logistics industry in Bosnia and Herzegovina. The survey is used as an instrument for data collection. For the purpose of research quantitative form of analysis was used.

Sample of the Study

The study explores the criteria which SME managers use for selection of 3PL provider as well as the perceived quality of performance of the 3PL provider. The population consisted of the managers of small and medium enterprises in the Bosnian and Herzegovinian companies which outsource some kind of logistics services. In the study, a random sampling method was used.

In order to achieve as much as possible representative picture data were collected from the small and medium enterprises which belong to the only five types of industries: manufacturing

industry, wholesale and retail industry, medical/pharmaceutical industry, service industry. These industries were chosen for the research because they comprise the biggest percentage of the industries in B&H.

2.6.Method of Data Collection

In total 120 surveys were distributed, and 104 responses were collected. Most of the surveys, 90 pieces, were distributed personally, and the rest of 30 were sent via email, LinkedIn or Facebook messages. 85 out of 90 surveys which were delivered personally to the managers or owners or directors of the companies were collected. On the other side, 19 out of 30 surveys were collected electronically. The response rate is 86%.

The survey consists of the three parts: First part includes information about the company such as the age of the company, number of employees, revenue, types of services outsourced from 3PL, length of services used and similar. The second part of the survey includes criteria which are used in a selection process of 3PL. It is divided into two parts: service quality and organizational performance.

- *Service quality* includes criteria about quality of the services, price, quality of the facility, equipment, vehicles, reliability, speed of the delivery, on-time delivery, low error rates, provision of consistent services, responsiveness to customer's request, reliable transportation, reliable warehousing, tailor-made services, wide range of services, and age of vehicles.
- *The part of organization performance* focuses on the criteria related to the organizational performance of 3PL. Some of the criteria mentioned in the survey are financial stability of 3PL partner, quick



response to market changes, reputation within the logistics industry, operation costs, asset turnover and the connection of 3PL provider within the Bosnia and Herzegovina and on the international market. Finally, the third part of the survey consists of the questions regarding actual logistics service and organizational performance of 3PL service provider (from the customer perspective).

3. Results

Research measures criteria used in the selection of 3PL provider and perceived performance of the third-party provider. Service quality is seen as the difference between expectations and perception. Criteria are compared with the perceived performance. Criteria of service quality are compared with the perceived service quality, criteria of the organizational performance are

compared with the perceived organizational performance. Analysis of the data was performed in the Statistical Package for the Social Science (SPSS). Findings show that the reliability of the data was on a satisfactory level since all Cronbach's Alpha Coefficient values were higher than 0.8.

Data analysis was aimed to measure if there is any relation between criteria used in the selection process of 3PL and degree of satisfaction with the services which are outsourced from the third-party provider (perceived service quality of 3PL). For the comparison between two different samples of the results, the Independent – Samples t-test was used. There were compared the criteria for selection and perceived the performance of the third-party logistics provider. The results of the analysis are presented in Table 4. The same variables were tested on both sides and the results are explained below

Table 4. Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means
		F	Sig.	Sig. (2-tailed)
Price	Equal variances assumed	25.334	.000	.000
	Equal variances not assumed			.000
Quality	Equal variances assumed	482.368	.000	.000
	Equal variances not assumed			.000
Facility	Equal variances assumed	19.083	.000	.000
	Equal variances not assumed			.000
Equipment	Equal variances assumed	1.870	.173	.462
	Equal variances not assumed			.462
Speed of delivery	Equal variances assumed	71.525	.000	.000
	Equal variances not assumed			.000



Responsiveness to unforeseen changes	Equal variances assumed	32.495	.000	.000
	Equal variances not assumed			.000
Reliable transportation	Equal variances assumed	52.391	.000	.028
	Equal variances not assumed			.028
Reliable warehousing	Equal variances assumed	5.750	.017	.001
	Equal variances not assumed			.001
Tailor made service	Equal variances assumed	.000	1.000	.000
	Equal variances not assumed			.000
Wide range of service	Equal variances assumed	7.765	.006	.000
	Equal variances not assumed			.000
Vehicles	Equal variances assumed	.586	.445	.178
	Equal variances not assumed			.178
Financial stability	Equal variances assumed	14.845	.000	.330
	Equal variances not assumed			.330
Fast respond to market changes	Equal variances assumed	.531	.467	.000
	Equal variances not assumed			.000
Reputation	Equal variances assumed	2.021	.157	.106
	Equal variances not assumed			.106
Low operation cost	Equal variances assumed	5.214	.023	1.000
	Equal variances not assumed			1.000
High asset turnover	Equal variances assumed	5.740	.017	.112
	Equal variances not assumed			.112
International network	Equal variances assumed	.355	.552	.557
	Equal variances not assumed			.557
Domestic network	Equal variances assumed	31.353	.000	1.000
	Equal variances not assumed			1.000

Service quality

There is a significant difference between the criteria and perceived value of price, which was the expected result.

The second comparison was made between criteria of “quality” and “the perceived quality” of services which are provided by the 3PL partner, in this case, like in the previous one significant difference was observed.

There is a significant difference in the assessment of the criteria of “facility” and “the perceived quality of facility”, whereas there is no significant difference in the assessment of criteria of “equipment” and “perceived quality of equipment”. While comparing the results of “speed of delivery” and “responsiveness to unforeseen changes” it is visible that there is a significant difference between



criteria used in the selection process and perceived performance of 3PL's services.

Most of the respondents outsource the transportation services from their 3PL partner, after comparison of the criteria and perceived the performance of "transportation" the significant difference is noticeable. On the other side, there is no significant difference in the criteria and perceived performance of the "warehousing" services.

Organizational performance

In the part of organizational performance, seven variables were measured. After the analysis, there was no significant difference between the criteria for "financial stability" of the 3PL partner and perceived performance of the 3PL. Most of the managers of small and medium enterprises perceive "financial stability" as one of the crucial factors for successful and reliable business relations.

Analysis of the variable of "respond to the market changes" showed that there is a significant difference between the criteria and perceived ability of the 3PL providers to respond to the market changes. Users of the 3PL services do not think that their business partners can easily follow market changes.

Table 5. Multivariate Tests H1a

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.999	8854.899 ^a	9.000	94.000	.000
	Wilks' Lambda	.001	8854.899 ^a	9.000	94.000	.000
	Hotelling's Trace	847.810	8854.899 ^a	9.000	94.000	.000
	Roy's Largest Root	847.810	8854.899 ^a	9.000	94.000	.000
Revenue	Pillai's Trace	.771	35.083 ^a	9.000	94.000	.000
	Wilks' Lambda	.229	35.083 ^a	9.000	94.000	.000

The reputation of the business partners is usually very important criteria in the selection of the 3PL partner. The analysis showed that there is no significant difference between the criteria and perceived "reputation" of 3PL partners.

There was no significant difference between the criteria of "the low operational costs" and perceived operational costs of a 3PL partner. The same was for "the high assets" turnover.

Answers about how "strong international" and "domestic network" need to be were diverse. However, there is no significant difference between criteria and perceived performance in both cases, which proves that the managers of SME in B&H know how to choose the outsourcer capable of giving services which they really need and which is a very good indicator of the reliability of the research as well.

For the testing of Hypothesis 1a and Hypothesis 1b study used the Multivariate Analysis of Variance (MANOVA). The output of the analysis of Hypothesis 1a is presented in **Error! Reference source not found.**5. From the results, it can be concluded that the Revenue has a significant effect on the service quality criteria for selection of 3PL



	Hotelling's Trace	3.359	35.083 ^a	9.000	94.000	.000
	Roy's Largest Root	3.359	35.083 ^a	9.000	94.000	.000

Results in Table 6. have proven that Revenue have a significant effect on the organizational

performance criteria in the selection process of 3PL

Table 6 Multivariate Test H1b

	Effect	Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.968	413.391 ^a	7.000	96.000	.000
	Wilks' Lambda	.032	413.391 ^a	7.000	96.000	.000
	Hotelling's Trace	30.143	413.391 ^a	7.000	96.000	.000
	Roy's Largest Root	30.143	413.391 ^a	7.000	96.000	.000
Revenue	Pillai's Trace	.441	10.814 ^a	7.000	96.000	.000
	Wilks' Lambda	.559	10.814 ^a	7.000	96.000	.000
	Hotelling's Trace	.788	10.814 ^a	7.000	96.000	.000
	Roy's Largest Root	.788	10.814 ^a	7.000	96.000	.000

The same type of analysis (MANOVA) study used for the testing of the Hypothesis 2a, Hypothesis 2b and Hypothesis 2c. The output of the analysis of Hypothesis 2a is presented in **Error! Reference**

source not found.7. From the results, it can be concluded that the length of the services used has a significant effect on the perceived service quality of 3PL

Table 7. Multivariate Test H2a

	Effect	Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	1.000	114488.378 ^a	10.000	92.000	.000
	Wilks' Lambda	.000	114488.378 ^a	10.000	92.000	.000
	Hotelling's Trace	12444.389	114488.378 ^a	10.000	92.000	.000
	Roy's Largest Root	12444.389	114488.378 ^a	10.000	92.000	.000



Length of service used	Pillai's Trace	1.746	63.810	20.000	186.000	.000
	Wilks' Lambda	.001	288.433 ^a	20.000	184.000	.000
	Hotelling's Trace	264.269	1202.425	20.000	182.000	.000
	Roy's Largest Root	261.279	2429.892 ^b	10.000	93.000	.000

Result of the analysis of Hypothesis 2b is presented in 8. From the results, it can be concluded that the Length of the services used has a significant effect

Table 8. Multivariate Test H2b

(sig.= .00) on the perceived organizational performance of 3PL

Effect		Value	F	Hypothesis is df	Error df	Sig.
Intercept	Pillai's Trace	.975	526.339 ^a	7.000	95.000	.000
	Wilks' Lambda	.025	526.339 ^a	7.000	95.000	.000
	Hotelling's Trace	38.783	526.339 ^a	7.000	95.000	.000
	Roy's Largest Root	38.783	526.339 ^a	7.000	95.000	.000
Length of service used	Pillai's Trace	1.076	15.985	14.000	192.000	.000
	Wilks' Lambda	.181	18.359 ^a	14.000	190.000	.000
	Hotelling's Trace	3.112	20.897	14.000	188.000	.000
	Roy's Largest Root	2.555	35.045 ^b	7.000	96.000	.000

The output of the analysis of Hypothesis 2c is presented in **Error! Reference source not found**.9. From the results, it can be concluded that

Table 9. Multivariate Test H2c

the Length of the services used has a significant effect (p= .00) on the perceived relationship management of 3PL

Effect		Value	F	Hypothesis is df	Error df	Sig.
Intercept	Pillai's Trace	.961	826.969 ^a	3.000	100.000	.000
	Wilks' Lambda	.039	826.969 ^a	3.000	100.000	.000
	Hotelling's Trace	24.809	826.969 ^a	3.000	100.000	.000
	Roy's Largest Root	24.809	826.969 ^a	3.000	100.000	.000



Length of service used	Pillai's Trace	.409	23.086 ^a	3.000	100.000	.000
	Wilks' Lambda	.591	23.086 ^a	3.000	100.000	.000
	Hotelling's Trace	.693	23.086 ^a	3.000	100.000	.000
	Roy's Largest Root	.693	23.086 ^a	3.000	100.000	.000

4. Discussion and Conclusion

The purpose of this study was to explore which criteria managers of small and medium enterprises in Bosnia and Herzegovina perceive as the most important in a selection process of 3PL provider and measure satisfaction with 3PL services (perceived performance of 3PL partner).

3PL affects the business processes of companies. Small and medium enterprises can use 3PL to gain competitive advantage. The private sector of Bosnia and Herzegovina is composed of 99% of small and medium enterprises. They are very important in creating jobs. Around 70% of the labor force which is employed in the private sector works in small and medium enterprises. (Vanjskopolitička inicijativa BiH, 2013). Small and medium enterprises in Bosnia and Herzegovina also face numerous internal weaknesses and limitations such as lack of knowledge about new advanced technologies, problems with sources of financing, low negotiation power, low efficiency or lack of knowledge about human resources. Small and medium enterprises usually have the owner who is at the same time the manager and the leader of the company. Often, the owner deals with duties related to supply chain and sales. (Vanjskopolitička inicijativa BiH, 2013)

The research measures the satisfaction of 3PL's service users. It measures how users of 3PL's services perceive the performance of the third-party logistics partners. Analysis proved that there is a significant difference between the criteria and

perceived value of price, quality, speed of delivery, responsiveness to unforeseen changes, reliable transportation, reliable warehousing, tailor-made service, a wide range of service, fast response to market changes, availability of top management and values good working relations.

On the other side, there is no significant difference between the importance of criteria and perceived performance for the following parameter: equipment, reliable transportation, vehicles, financial stability, reputation, low operation costs, high assets turnover, strong international network, strong domestic network and the valuing of a long-term relationship.

Revenue has a significant effect on the service quality criteria for selection of 3PL partner and on the organizational performance criteria in the selection process of a 3PL partner. Companies which have greater revenue tend to have higher criteria in the selection of a 3PL partner.

The length of the services used has a significant effect on the perceived service quality of 3PL, the perceived organizational performance of 3PL and the perceived relationship management of 3PL.

The longer the company uses the services of 3PL partner the better it perceives the quality of the services. Also, as the period of use of 3PL services increase, managers of small and medium enterprises create a better image of the organizational performance of third-party partner. As it is expected



the length of the services used positively affects the relationship with the 3PL partner.

Age of vehicles is positively correlated with the perceived speed of delivery, perceived responsiveness to unforeseen changes and perceived reliable transportation. Companies which uses 3PL services tend to perceive the services of their partner much better and valuable if the average age of the vehicles used in operation is high.

4.1.The practical and theoretical contribution of the study

The study of 3PL evolution provides guidelines for future trends in 3PL development. It contributes to the future competitive strategy planning and the company's understanding of the way 3PL contributes to its corporate plans. Comprehensive literature review reveals that there is a lack of study of 3PL in general, especially about criteria which outsourcers use while choosing 3PL partners. There is not enough similar study in Bosnia and Herzegovina. Since there are just a few researches made in the field of 3PL in Bosnia and Herzegovina, scholars will have a source of information and a good base for future research. The study provides a solid theoretical background and can serve as a helpful base for future research on the topic of outsourcing logistics or 3PL.

4.2.Limitation of the study

Limitation of the study is in its scope. It is mainly based on the criteria for the selection of a 3PL partner and the perceived performance of a 3PL partner.

Deeper analysis with more detailed results can be performed if there were measured the actual performance of 3PL and expected performance. The

best way to do this kind of research is to make an analysis of both actual and perceived performance.

The second limitation is the sample size. The sample size was too small to represent all population of the 3PL services users in Bosnia and Herzegovina. For more reliable and accurate results should be chosen a bigger sample size.

The third limitation is the small diversity of the sample. Most of the respondents are outsourcing one logistics service and, in most cases, it is the transportation of products. However, users differ in the scope of transportation services and some are outsourcing logistics for international transportation whereas the other is outsourcing logistics for transportation inside the country.

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