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WHICH FACTORS DRIVE THE REVERSE LOGISTICS PROCESS IN PRACTICE: EVIDENCE FROM SERBIA

Koji faktori pokreću povratni logistički proces u praksi –
Dokazi iz Srbije

Abstract

Green supply chain and reverse logistics, as its key dimension of functioning, represent one of the most up-to-date areas of analysis in the business philosophy of supply chain management, which have been in the focus of scientific and expert public for less than two decades. The basic shortcoming concerning the research in this field is insufficient practical research in the area, which is the main motive for the realization of this paper. The research subject of this paper is identification of the most relevant factors for the usage of the reverse logistics process activities in companies that participate in the supply chain in Serbia. The aim of the paper is to identify specific factors important for the usage of the reverse logistics process in Serbia, as well as to widen and enrich the scientific and practical findings in this area.

Keywords: *green supply chain, reverse logistics, Delphi method, Serbia.*

Sažetak

Zeleni lanac snabdevanja i povratna logistika, kao njegova ključna dimenzija operacionalizacije, predstavljaju jedno od najaktuelnijih područja analize poslovne filozofije upravljanja lancem snabdevanja, koje je u fokusu naučne i stručne javnosti manje od dve decenije unazad. Osnovni nedostatak vezan za razmatranje ove problematike jeste nedovoljno prisustvo praktičnih istraživanja u oblasti, što je i glavni motiv za realizaciju ovog rada. Predmet istraživanja u radu jeste identifikovanje najrelevantnijih faktora za primenu aktivnosti povratnog logističkog procesa kod preduzeća-učesnika u lancu snabdevanja u Srbiji. Cilj rada jeste da se identifikuju specifični faktori od kojih zavisi primena procesa povratne logistike u Srbiji, kao i da se prodube i obogate naučna i praktična saznanja u ovoj oblasti.

Ključne reči: *zeleni lanac snabdevanja, povratna logistika, Delfi metod, Srbija.*

Introduction

The entire scientific and expert analysis of the green supply chain and reverse logistics, as its main dimension, conducted up to now has confirmed the absence of empirical analyses in the area. When a certain sphere of scientific, but also practical interest is on such a rise on a global scale, as is the case here, the mentioned empirical analyses and primary research represent an essential initiative for its further progress and propulsivity. Bearing in mind that the area of green supply chain and reverse logistics is almost marginally present in scientific and expert analyses in our national milieu, the importance of carrying out empirical research is additionally emphasized. That was the basic, starting idea when devising this paper.

The analysis in the paper is dedicated to identification of the most relevant factors for the usage of the reverse logistics process in companies that participate in the supply chain in Serbia. The paper itself is divided into four parts. A short review dealing with the previous findings about this topic and the explanation of the importance of carrying out empirical analysis are presented in the first part. The second part of the paper explains the methodological procedure of empirical analysis. The research uses the Delphi method, as a technique of providing expert group opinion. The methodological procedure initially refers to a detailed review of research participants, i.e. the managers from several chosen industries in Serbian business practice. The usage of the Delphi method is realized through several rounds until consensus between managers is reached. Specific results of every round are separately analyzed. Finally, the consensus reached through rounds is measured, as the following logical segment of the methodological review. The third part of the paper is dedicated to the discussion of obtained results, with the review of their theoretical and practical

implications. Since no research can be carried out in ideal conditions, the limitations of the conducted analysis are also presented. Finally, based on all stated facts and results, the directions and key challenges of future research are pointed out. The last two segments represent the area of analysis within the fourth part of the paper. The aim of the paper is to identify specific factors important for the usage of the reverse logistics process in Serbia, as well as to widen and enrich the scientific and practical findings in this area. The analysis of all of the stated issues follows.

Previous findings and the importance of carrying out new research

Managing the green supply chain and reverse logistics, as its key dimension, represents a relatively unfamiliar and challenging scientific area. However, based on the previous statement it cannot be concluded that there is a lack of good research in this area. Affirmed authors in this area, such as Carter, Ellram, Daugherty, Closs, Guide, Gupta, Srivastava, Rao, Mollenkopf and others, have written a handful of papers, but mostly of conceptual and theoretical nature. The analysis in this area has been performed both on the micro and macro levels. Focusing on the research which has a macro perspective, some of the most important contributions are presented in Table 1.

Besides dealing with this issue on a macro level, a far greater number of papers focus on the micro level of analysis. The examples of such research are given in Table 2.

The aforementioned papers belonging to both analyzed perspectives should not be perceived in any way as the only ones worth mentioning, but solely as chosen to illustrate the issue they cover. The main characteristic of all of the given papers, as well as generally of other papers in the field in the past period has been rare empirical verification.

Table 1: Chosen key research of the issue of green supply chain and reverse logistics on a macro level

Research authors	Research results
Croxton & associates (2001)	Adequate management of the reverse logistics flows and the green supply chain has a positive economic and ecological influence on the performance of chosen industries.
Lambert & associates (2005)	The successful development and implementation of the green supply chain and its dimensions has a positive impact on the development of the economy as a whole.
Closs & associates (2011)	Adequate management of the reverse flows and the usage of resources along the supply chain represent the basis of a sustainable strategy.

Source: [5, pp. 242-263].

For example, after an extensive and detailed literature review in the field, which included more than 150 expert articles published in renowned global magazines in the last 15 years, it can be stated that less than 15% of them contain some sort of empirical verification. The reasons for the identified shortcoming can be various: lack of the needed set of skills and knowledge of the authors of the papers to devise empirical research; difficulty in connecting theoretical findings and practical implications due to expressed complexity in the area of analysis; insufficient recognition of the issue, importance and benefits of green initiatives and reverse flows in company operations in certain parts of the world, etc.

Taking into consideration the situation in national scientific circles, the need for carrying out empirical research is even more expressed and justified. Particularly, the issue of managing green supply chain and reverse logistics flows has been marginally present in scientific analyses in the domestic academic milieu, i.e. it has hardly been addressed at all. There are only few scientific papers which deal with this area in some segments. The main findings in the national scientific circles are presented in Table 3.

Based on the shown elements of analysis in stated papers, but also bearing in mind their identified shortcomings, it can be stated that the topics of green supply chain and reverse logistics have been treated only by few review papers, mostly of theoretical character, without the integrating perspective and adequately established relations between the key terms. Therefore, the foreseen empirical research can practically be interpreted as the initial endeavor in clarifying the unknown elements in this area in Serbia. It is justified to believe that it can seriously contribute to future incentives for its development and detailed examination.

The steps of the methodological procedure used in the research¹

The aim of the empirical analysis in the paper is to respond to the research question presented in the title of the paper: Which factors drive the reverse logistics

¹ The presented research has originally been carried out for the purpose of a PhD thesis: Mijušković, V. (2017). *Adaptibilnost modela i uticaj povratne logistike na konkurentnost zelenog lanca snabdevanja*. Beograd: Ekonomski fakultet Univerziteta u Beogradu, and has not been published up to now.

Table 2: Chosen key research of the issue of green supply chain and reverse logistics on a micro level

Research authors	Research results
Bacallan (2000) [1, pp. 11-12]	Greening the activities within the supply chain leads to the achievement of competitive advantage for its participants.
Daugherty & associates (2002) [4, pp. 85-106]	The implementation of IT support has a significant positive influence on the improvement of reverse logistics activities.
Guide & associates (2003) [6, pp. 259-279]	The development of cognitive planning improves the "closing of the loop" and product return within the supply chain.
Hazen & associates (2011) [7, pp. 379-389]	Consumers perceive the products of the reverse logistics process as products of inferior quality compared to new ones.
Hazen & associates (2012) [8, pp. 244-274]	Return options represent the main group of activities within the reverse logistics process.
Huscroft & associates (2013) [10, pp. 304-327]	Client support, top management support and developed system of communications have been identified as the key factors of influence on the reverse logistics process.

Table 3: Elements of analysis of green supply chain and reverse logistics in national scientific circles

Research authors	Elements of analysis	Limitations of analysis
Milovanović, Barac (2007) [15]	Consideration of importance of reverse logistics as a part of the supply chain.	No direct connection between green supply chain management and reverse logistics has been established; review, theoretical paper.
Krstić, Stefanović (2008) [13, pp. 1-10]	Connection between the concept of corporate social responsibility (CSR) and the ecological performance of the supply chain.	CSR is completely equated with green initiatives, which is denied by theory.
Krstić, Jovanović (2008) [12, pp. 107-121]	Expression of importance of green and ecological initiatives for a company to achieve competitive advantage.	Insufficient recognition of the concept of green supply chain and reverse logistics; review, theoretical paper.
Miljanović (2012) [16, pp. 75-86]	Explanation of the concept and strategies of the green supply chain.	CSR is completely equated with green initiatives, which is denied by theory; review, theoretical paper.

process in practice? Namely, after analyzing the research carried out on a global scale, concerning the key factors of influence on the realization of reverse logistics flows, several conclusions can be made.

First, there are generally few scientific and research papers treating the mentioned issue. Second, after analyzing those few papers, it has been demonstrated that the most common and best approach to addressing this issue is the creation of certain frameworks and models within which the factors considered the most important for the realization of reverse logistics flows are shown in a comprehensive way. Third, out of the existing theoretical models which analyze the key factors driving the realization of reverse logistics flows, experts identify the model developed by Carter and Ellram in 1998 as the best and most comprehensive. This model identifies 9 factors of influence on reverse logistics: state regulations, client support, input quality, system of communication and vertical coordination, independence, dedication of interest groups, top management support, influence of internal entrepreneurs and system of incentives. These factors can additionally be divided into internal and external, as well as into those of limiting and stimulating nature. The main shortcoming of this model is the absence of practical verification [2, pp. 85-102]. Fourth, the only existing model which analyzes key factors of influence on the realization of reverse logistics flows, generated in an empirical manner, is the model of Huscroft and associates from 2013. This model identifies 7 factors of influence on the reverse logistics process: client support, top management support, developed system of communication, costs, process formalization, timeliness of operations and ecological issues. The key result of this research, which is in line with the findings of the model by Carter and Ellram, is that there is a direct connection between three factors in the theoretical Carter and Ellram's model and the empirically confirmed model devised by Huscroft and associates. These factors are: client support, top management support and developed system of communication. Research has shown that the managers have achieved consensus regarding these three factors, declaring them to be the most important three factors for the realization of the reverse logistics process in the given order of importance [10, pp. 304-327].

Bearing in mind the stated conclusions and seeking to respond to the posed research question, the following hypothesis has been constructed:

H₁: The most important factors of the reverse logistics process in Serbia are client support, top management support and developed system of communication.

The research is carried out in the same manner as the only mentioned empirical research in this area – the research performed by Huscroft and associates in 2013, in order for the results to be comparable. This means that the research is carried out using the Delphi technique. Thus, it consists of the following steps: defining research participants, analyzing each of the three Delphi rounds, measurement of the reached consensus and the discussion of the obtained results. Each step is explained below.

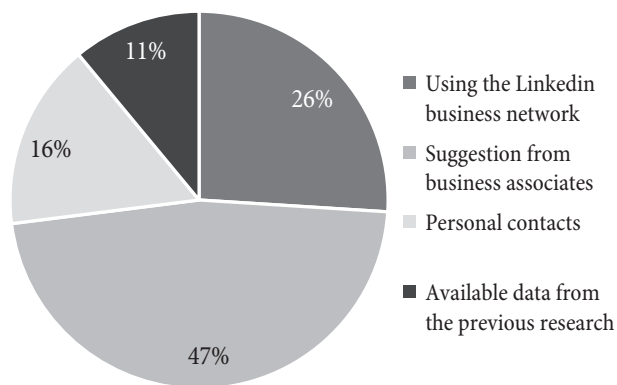
Defining research participants

Bearing in mind the specific nature of the problem, but also following the recommendations by Huscroft and associates [10, pp. 304-327], we created an expert panel gathering a wide range of managers from different parts of the economy as the representatives of entities typically involved in the implementation and/or realization of any type of reverse logistics activity. Particularly, company managers from the following industries have been contacted: logistics providers, retail and fast moving consumer goods industry, metal processing, carton and soft drinks production, construction materials industry, pharmaceutical industry, IT industry, automotive industry, etc. All contacted managers are representatives of companies from the private sector. The decision to analyze only the private sector was made due to the fact that in Serbia mostly the companies from this sector have commercial arrangements in some form connected to reverse logistics flows and, thus, their managers have the knowledge necessary to be included in the process of research. Since the expert panel should ideally consist of 5 to 30 participants [14, pp. 762-769], and respecting the fact that more than 50% of initially contacted respondents can be lost during the process of research [3, pp. 29-49], initial invitation for participation in the Delphi study was sent to email addresses of 76 company managers in Serbia

covering the previously stated industries, hoping that the minimum of 20 managers would be present during all phases of the Delphi study. Email addresses were obtained from four sources: 1. based on a suggestion from business associates (36 email addresses), 2. using available data from the previous research (20 email addresses), 3. based on personal contacts (12 email addresses) and 4. using the LinkedIn business network (8 email addresses).

The structure of managers initially contacted for participation in the Delphi study by the source of acquiring email address is shown in Figure 1.

Figure 1: The structure of managers initially contacted for participation in the Delphi study by source of email address



Thirty-five out of 76 contacted managers generally agreed to participate in the Delphi study, representing the response rate of 46%, which can be interpreted as significant. However, at the end of the Delphi round I the response was given by 32 managers, while 25 participants remained until the end of the research. Since the research was anonymous, the identity of managers from the group of 35 experts who generally agreed to participate and later on resigned through rounds is not known and neither are the basic data regarding the company from which the managers generally originate. Other personal data about the managers (gender, level of education, age, length of service, possession of knowledge about logistics, level of management) and the data about the companies they come from (size and type) were gathered through questionnaires in every Delphi round and the process was repeated in each round, which was the recommendation from the research performed by Huscroft and associates [10, pp. 304-327]. The questionnaires were analyzed while interpreting

individual rounds. A detailed accompanying letter was sent via email to managers who generally expressed their willingness to participate in the research, thanking them for the participation and shortly explaining the purpose of the Delphi technique and what was expected of them, as well as the very purpose of this research. The participants were informed that the study would be realized through several iterations and that each of them would contain a link with a questionnaire, available for two weeks. The questionnaire should be filled out and sent back in every round. Also, managers were offered assistance from the authors of the paper, if necessary, at any point of the research.

Delphi rounds

The entire Delphi study was realized through three separate iterations, i.e. three Delphi rounds, which is the usual number of rounds. Each of the Delphi rounds was open for providing answers in the period of two weeks, making the total length of the Delphi study 45 days. The entire study was conducted in the first quarter of the previous year. Each Delphi round included filling out a particular questionnaire. All three questionnaires consisted of two parts. The first part was the same in all three questionnaires and it gathered general data about the manager (gender, level of education, age, length of service, possession of knowledge about logistics, level of management) and the data about the company they were coming from. The purpose of repeating this part was to at least see how the structure of respondents changed through rounds, despite the obligatory anonymity. Since this part of the questionnaire is less important for the final results of the research, and due to limited space for analysis, the focus shall hereafter only be on the second part of the questionnaire, which presents the essence of every round. That essential, second part of the questionnaire is specific, i.e. it differs in all three questionnaires and is aimed at identifying the relevant factors of influence on reverse logistics. The answers obtained through a focused process lead to a group consensus about the way the given factors were ranked according to the degree of importance. Specifics of each of the three rounds are analyzed as follows.

Delphi round I

As it has already been pointed out, out of 35 managers who generally consented to participation in the Delphi study, 32 completed the questionnaire from the Delphi round I, which indicates that the initial response rate was 91.4%.

The purpose of the Delphi round I questionnaire was for the experts to initially identify on their own the factors that influence the realization of reverse logistics flows. To that effect, the mentioned questionnaire (i.e. its second part) contained an open-ended question to which the managers had to give an answer.

The precise question was:

“Which factors predominantly determine the implementation of the process and program of reverse logistics in your company?”

With the aim of offering additional clarification of the very term and avoiding potential confusion about what reverse logistics represents, expert and colloquial interpretation of the meaning of the term was given in addition to the question [17, p. 4]. After the answers of panel participants had been gathered, qualitative analysis was performed by sorting and categorizing them and finding mutual relations between them, which was the logical next step. In order to adequately sort and categorize data, a logistics practitioner with long-term experience in the segments of business connected with reverse logistics was consulted, as well as an expert in business connected with market research. After the consultations and a detailed analysis of the answers, 19 logical elements, i.e. influence factors were initially identified. Bearing in mind which factors

have been identified as relevant for the reverse logistics flows in global research, and noting that there is noticeable similarity between certain initially identified factors in this research (for example legal regulations concerning green practice and existing laws and regulations), individual factors were regrouped and united, where possible, thus forming a group of 6 factors of influence on the reverse logistics process. These are the following (in no specific order): top management support, costs and benefits of usage, developed system of communication, ecological issues, state regulations and client support. The way of regrouping and unification of factors is shown in Table 4.

Delphi round II

At the beginning of the Delphi round II, a link with a new questionnaire containing the results of the Delphi round I (an unranked list of 6 identified factors of influence on reverse logistics) was forwarded to email addresses of all managers who had given their general consent to participate in the study. Out of 32 managers who had participated in the Delphi round I, 28 answered the questionnaire from the Delphi round II, which indicates that the response rate in the second round was 87.5%. The Delphi round II questionnaire starts with the information obtained as the result of the Delphi round I: the factors identified in the Delphi round I were presented to the managers in the second part of the Delphi round II questionnaire, asking them to put the 6 factors in order of importance from the most important (rank 1) to the least important (rank 6). Managers were informed that two factors cannot have

Table 4: Way of regrouping the identified factors of the Delphi round I

Grouped factor	Top management support	Costs and benefits of usage	Developed system of communication	Ecological issues	State regulations	Client support
Individual factors	Understanding the importance by company management; Funds allocated by company management for the realization of reverse logistics activities; Leadership vision.	Financial benefits of using reverse logistics; The amount of costs of activities; Return on reverse logistics investment; Operating costs.	Constant information exchange within the supply chain; Joint IT systems of supply chain participants; Tracing goods through the supply chain; Integration of all participants within the supply chain.	System of recycling; Organization of waste disposal;	Obligations prescribed by the state; Legal regulations concerning green practice; Existing laws and regulations.	Client expectations; Impact of reverse logistics on customer service; Better company image in the eyes of consumers.

the same rank. In order to help them with the process of ranking, they were given a short explanation for each of the factors on the basis of individual elements/factors which had been grouped in the Delphi round I. After individual rankings of the factors performed by 28 managers who participated in the Delphi round II, group ranking of six factors of influence on reverse logistics was performed using the method of weighted rank average. According to the model of Huscroft and associates [10, pp. 304-327], the weight was calculated according to the following formula: $(\text{the lowest rank} + \text{the highest rank} + (n-2) \times \text{average rank})/n$, where n is the size of the expert panel, which in this precise case was $n=28$. According to group ranking, costs and benefits of usage have been identified as the most important factor from the Delphi round II, while the developed system of communication was nominated as the least important factor. The factors ranked by the group and their weighted rank averages are presented in Table 5.

Table 5: Group ranking of factors that influence the reverse logistics process in the Delphi round II

Rank (1-the most important factor, 6-the least important factor)	Factor	Weighted rank average
1	Costs and benefits of usage	2.34
2	Top management support	3.17
3	State regulations	3.43
4	Client support	3.77
5	Ecological issues	4.10
6	Developed system of communication	4.20

Delphi round III

At the beginning of the Delphi round III, a link with a new questionnaire, containing the results of the Delphi round II (group ranking of factors that influence the reverse logistics process), was forwarded to email addresses of all managers which had given their general consent to participate in the study. Out of 28 managers who had participated in the Delphi round II, 25 answered the questionnaire from the Delphi round III, which indicates that the response rate in the third round was 89.3%.

The Delphi round III questionnaire starts with the information obtained as the result of the first two rounds. Based on the aforementioned, the group ranking of key

factors of influence on the reverse logistics process was shown to the managers. After that, they were asked to consider them once again and perform an additional ranking of the identified 6 factors using the weighted rank average method. The used weight was calculated in the same manner as in the Delphi round II. Again, according to group ranking, costs and benefits of usage were identified as the most important factor from the Delphi round III, while developed system of communication was again nominated as the least important factor. The group ranking of the factors in between also remained unchanged. The final factors according to group ranking and their weighted rank averages are given in Table 6.

Table 6: Final group ranking of factors of influence on the reverse logistics process in the Delphi round III

Rank (1-the most important factor, 6-the least important factor)	Factor	Weighted rank average
1	Costs and benefits of usage	1.23
2	Top management support	2.04
3	State regulations	2.74
4	Client support	4.11
5	Ecological issues	4.89
6	Developed system of communication	5.92

Since, in general, there is no difference between the group ranking of the key factors of influence on the reverse logistics process in the Delphi rounds II and III, it can be concluded that a consensus was reached among the managers who were members of the expert panel.

The measurement of the reached consensus

The consensus reached after the Delphi rounds II and III was measured based on the Kendall's coefficient of concordance (Kendall's W). Besides the recommendation to use this coefficient for measuring the consensus in Delphi studies reached by the experts in the area [18, pp. 763-774], the reason for its use was also the model of Huscroft and associates which is followed in this research [18, pp. 763-774]. This coefficient measures the degree of concordance between the ranks which, in the case of this research, have been attributed by the managers, members of the expert panel. Values taken into consideration range from 0 to 1, where 0 means that there is perfect

discordance between the experts doing the ranking, while 1 implies perfect concordance between the experts. Using the IBM SPSS statistics 22.0 software package [9] allows for a nonparametric test based on the W statistic to be carried out in the following manner: in the menu for analysis, the nonparametric tests option is to be chosen, followed by marking the K-dependent samples option. After that, the testing of the variables option is set and Kendall's W is marked as the test type [19]. In this test, H_0 stands for no concordance between the experts giving the rank, while H_1 stands for absolute concordance between experts giving the rank. Using the mentioned statistical software package, it was tested whether there is consensus between the managers in the Delphi round II. The result is shown in Table 7.

Table 7: Obtained results on the degree of reached consensus between the managers in the Delphi round II

N	28
Kendall's W	0.157
Degrees of freedom	5
P value	0.001

Since $p=0.001$, the decision was made to discard H_0 and to conclude that concordance between the managers in the Delphi round II existed. The obtained value of the Kendall's W was 0.157, which indicates that only mild consensus was reached between the managers – members of the expert panel. After that, the same test was also used in the Delphi round III. The obtained result is shown in Table 8.

Table 8: Obtained results on the degree of reached consensus between the managers in the Delphi round III

N	25
Kendall's W	0.953
Degrees of freedom	5
P value	0.000

Since $p=0.000$ for any level of significance, the decision was made to discard H_0 and to conclude that concordance between managers in the Delphi round III existed. The obtained value of the Kendall's W was 0.953, which indicates that almost perfect consensus was reached between the managers who were members of the expert panel. Bearing in mind the results of the cited test, it can

be concluded that the Delphi study was successfully carried out, since the consensus between managers about the key factors, i.e. the most important factors, for the realization of the reverse logistics process was reached.

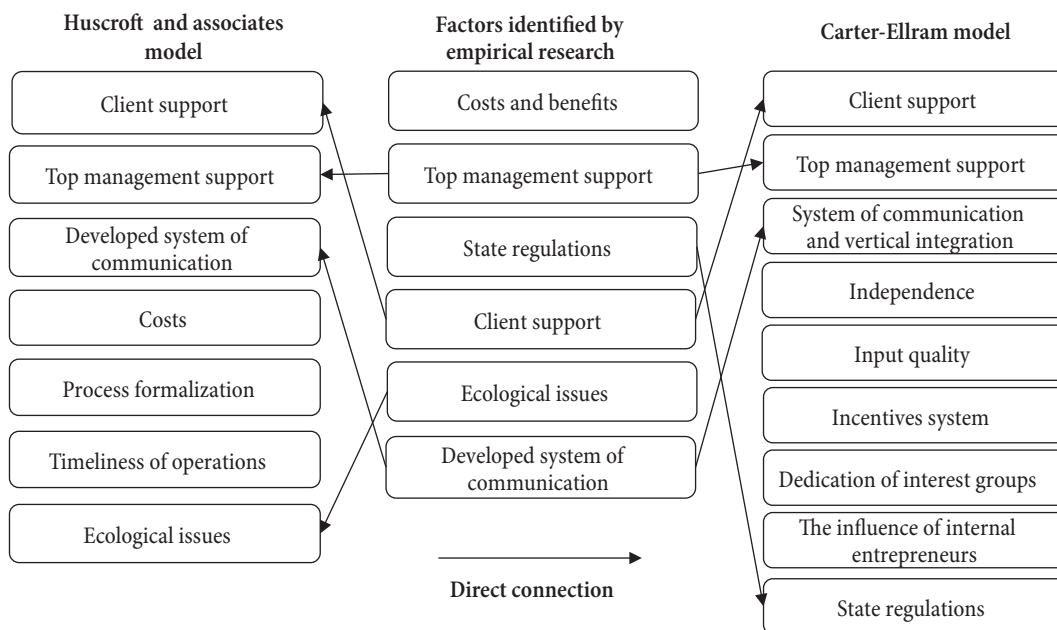
Discussion of the obtained results

Since consensus between Serbian managers about the most important factors was reached, identifying top three among them (costs and benefits of usage, top management support and state regulations), we can notice that only one of these three factors (top management support) has also been ranked among top three in the research performed by Huscroft and associates, which served as a model for this research and for the testing of H_1 . The other two factors (client support and developed process of communication) are identified among the six most influential factors in Serbian business scene, but have not been ranked as the three most important ones. This means that the paper hypothesis H_1 has only been confirmed partially.

Based on the obtained conclusions and the tested research hypothesis, it can be said that the conducted analysis has a great number of implications of both theoretical and practical nature. Since this is a scientific research paper, the analysis predominantly contains elements of theoretical nature. From the theoretical aspect, it can be concluded that the most important factors of influence on reverse logistics identified in Serbian business scene are compatible with those within globally affirmed models, such as the Carter-Ellram model or the model of Huscroft and associates. As it has already been mentioned, out of a total of six identified factors in the research, five factors exist in the empirical model of Huscroft and associates (out of which 3 factors are identical in both models), while one factor recognized earlier in the theoretical Carter-Ellram model has also been recognized in this research under the same name and degree of comprehension (the state regulations factor). There is direct connection between the factors identified in Serbian business practice and those in global research shown in Figure 2.

Besides the direct connection with individual factors of globally affirmed models, one other fact is immediately noticeable in the group of factors identified

Figure 2: The connection between reverse logistics factors identified in Serbian business practice and the Huscroft and associates/Carter-Ellram models



in Serbian business scene. Their number is smaller than in empirical research performed by Huscroft and associates, and especially in relation to the theoretical settings given by Carter and Ellram. Bearing in mind that this field of logistics management is still marginally researched and equally modestly present in the everyday business life in Serbia, it comes as no surprise that there is generally little familiarity with the reverse logistics process and, thus, with the factors which determine its functioning. However, it is encouraging that the identified factors or problem areas, although present in a smaller number, are identical with the dilemmas met by the managers in more advanced economies of the world where reverse logistics activity is far more developed. That means that applied research in this field, in Serbia or on a global level, treats the same issues that can be compared in practice, when it comes to ways of surpassing and/or improvement thereof.

Research limitations and directions of future analysis efforts

It is almost impossible to conduct any empirical research in ideal conditions. Therefore, it is always important to point out the limiting factors which influence the degree of plausibility of the conclusions drawn and the implementation of the drawn conclusions connected to the key research

questions. In that manner, a more realistic image of the phenomenon or the issue analyzed is presented.

Focusing attention on potential limitations of empirical research connected to adaptability of the model of reverse logistics through the analysis of key factors of its usage, two key elements can be noted [11, pp. 87-94]:

- a) *The selection of managers who entered the expert panel in the Delphi study.* As it has already been mentioned, in this case the expert panel was formed from a number of managers coming from different branches of the economy, as the representatives of entities typically connected with the implementation of or having expertise in at least some form of reverse logistics activities. Specifically, the expert panel included managers from companies from the following areas: logistics providers, retail and fast moving consumer goods industry, metal processing, carton and soft drinks production, construction materials industry, the pharmaceutical industry, IT industry, automotive industry, etc. Although significant diversification was achieved concerning the industries from which the managers came from, all managers were representatives of the companies coming exclusively from the private sector. Bearing in mind that the defense industry represents one of the

biggest collective supply chains in the world and an important part of a country's economy, the absence of this state segment can influence the results to a certain degree, making them insufficiently representative. However, there are at least two reasons in favor of the decision to exclude the state sector (defense). First, the very research performed by Huscroft and associates showed that, although general differences in perceptions of managers in the private and state sector surely exist, in this precise case, i.e. identification of the key factors of reverse logistics, a very high degree of consensus was achieved (Kendall's W was 0.9, and p value was equal to 0.001, indicating that the difference was not noticeable, i.e. that it was irrelevant whether the state sector was included or not). Second, which is even more important, the decision to analyze only the private sector was made due to the fact that in Serbia private companies mostly can and dominantly do have a commercial arrangement in some form connected to reverse logistics flows and, thus, the knowledge necessary for their managers to be included in the process of research. As regards reverse logistics flows, the military is mostly in charge of the management of waste disposal, specifically of dangerous substances and raw materials used for its own purposes (explosive devices, various poisonous substances, etc.), which has no wider commercial implications. Such point of view was additionally confirmed in conversations with a certain number of members of the state sector of defense and security. The aforementioned arguments somewhat "cushion" the specified shortcoming.

b) *Exclusive use of the Huscroft and associates/Carter-Ellram models in the conducted analysis.* The research was performed exclusively according to the model and methodology of the empirical survey performed a few years ago by Huscroft and associates, based on the theoretical achievements from the paper written by Carter and Ellram. On the one hand, it could rightfully be stated that the model defined in 2013 is not in use long enough, i.e.

that it has not been affirmed in practice as the basic model for the analysis carried out in this paper. On the other hand, it can also be said that the second theoretical model, almost twenty years old, is probably surpassed and non-functional. However, there are several arguments which could counter the cited shortcomings in this segment as well. First, in the entire theoretical analysis of reverse logistics up to now, the Carter-Ellram model represents the most comprehensive insight into the existing literature with the aim of identifying the key factors which determine its realization, which is confirmed by numerous other more recent papers in the field [20, pp. 953-962], [21, pp. 120-141]. Second, it is important to note the fact that up to now the model by Huscroft and associates has represented a unique empirical testing of this topic, which is why its contribution is especially valuable. Finally, it is necessary to point out that the positioning of this empirical analysis covering Serbia within affirmed research in global context allows for a special dimension of comparison and connection with global knowledge, which increases its value and justifies the choice of the models.

In the period to come, the focus of research efforts can be directed toward the following topics connected to the performed research:

a) *Performing in-depth one-on-one interviews with the representatives of companies that have participated in empirical research concerning key factors of influence on reverse logistics.* It has already been pointed out that the use of the Delphi study is simpler and economically more favorable than using one-on-one interviews. However, these interviews can secure precious information which cannot be gathered using a classical Delphi study. As a reminder, the Delphi study allows the identification of factors of influence on some manifestation and the achievement of consensus regarding their ranking, nothing more. Using established contacts with the existing sources of information, i.e. employees in companies which participated in the research, a series of in-depth interviews can be organized one-on-one, securing

and establishing a greater degree of trust and closeness with the respondents, which would result in greater freedom in defining types and scope of questions and in a corpus of information of better quality as the final output. Of course, in order for this method to be carried out, it is necessary to obtain consent from all managers-respondents, but also to meet other criteria which were previously discussed.

- b) *Carrying out a regional survey concerning key factors of influence on reverse logistics using the research model already implemented in Serbia.* Bearing in mind the defined methodology based on the research by Huscroft and associates, it is possible to carry out an identical Delphi study for the chosen countries of the region – Bosnia and Herzegovina, Republic of Srpska, Macedonia, Montenegro, Croatia, Slovenia. The data obtained for every country would be an ideal basis for carrying out a unique comparative study, where a clear insight could be obtained into the specifics, similarities and differences which exist among all of the mentioned countries when it comes to issues of managing reverse logistics flows and identifying key factors of influence on it. It would be especially interesting to see the situation regarding this issue in Croatia and Slovenia, since they are members of the EU, which is the primary strategically defined geopolitical goal of Serbia as well. It is clear that the realization of this regional survey would represent a serious financial, organizational and logistics endeavor, which is why a detailed preparation would be necessary if a decision to perform the regional research was made.

Conclusion

After carrying out the empirical analysis concerning the identification of the factors which influence the reverse logistics process in Serbia, several conclusions can be drawn. First, an almost perfect concordance of the managers who participated in the expert panel was reached. The identified factors of influence on the reverse logistics process in Serbian business practice, in order of decreasing importance, are the following: costs and benefits of usage, top management

support, state regulations, client support, ecological issues and developed system of communication. Second, it has been stated that the identified factors exist under the same or similar name and have the same level of comprehension as the factors identified within globally affirmed models of Carter and Ellram and Huscroft and associates. There is no particularly differentiated factor specific for the Serbian business scene which has not been identified in one of the two globally affirmed models. Third, theoretical implications of this analysis indicate that the number of factors identified in the Serbian business scene is smaller than the number of factors in the model by Huscroft and associates, and especially in the theoretical model of Carter and Ellram, which comes as no surprise since in the national context there is generally less familiarity with the reverse logistics process and, thus, with the factors which determine its structure and functioning. Fourth, the practical implications of this analysis indicate that the managers who do decide to implement reverse logistics flows must value the importance of individual factors, since this enables them to correctly allocate scarce resources when making managerial decisions. Finally, based on the entire analysis of this empirical study, certain future directions of research concerning reverse logistics in the national business context have been suggested.

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