

## REVERSE LOGISTICS IN THE CZECH REPUBLIC: BARRIERS TO DEVELOPMENT

R. Škapa

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### Abstract

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The article presents empirical survey results concerning two objectives. The first objective was to describe barriers of reverse logistics (RL) development in Czech companies. The other one was to research whether there are different views of these barriers between company experts and top managers. The analyses are based on data obtained through a questionnaire survey of 102 representatives of companies operating in the Czech Republic. The study applied basic statistical methods used in quantitative research.

Based on answer frequencies of respondents, the main internal barrier of RL development is its little importance in comparison with other activities, followed by the lack of systematic management, and unskilled workforce. On the other hand, customers are regarded as the most significant external barrier due to their careless handling with products and packaging as well as their pressure on the sale price. The obtained data also speak volumes about the differences in the view of the RL importance (in the second part of the article). Employees whose work is directly connected with reverse flows report the insignificance of RL as a barrier less frequently than top managers, who quoted this opinion in 50% cases.

reverse logistics, management of reverse flows, perception of barriers, survey results

For several tens of years theorists and practitioners have been perfecting ways of material flow management, and they have been trying to find a solution that is as efficient as possible. It has to be admitted that significant advancement has been achieved in this field. Consumers can get any material transformed into finished products within a shorter time and at lower costs than in the 1960s or 1970s. In other words, businesses can manage quite efficiently the material flow that is “traced” from the point of raw-material extraction through several manufacturers and producers to a consumer (i.e. a forward flow). However, requirements for logistics have been increasing and changing at the same time.

Although forward flows have been closely watched by managers, logistics of a material that was transferred in the opposite direction, i.e. from customers, has been marginalized. This material flow, made by claimed, used or unsold products and packaging that retailers and end users return to their

supplier or producer, is referred to as reverse flow (Kokkinaki *et al.*, 2000).

Activities associated with the management of these materials and their processing started to be called reverse logistics (RL) in the mid-1990s (Rubio *et al.*, 2008). Brito and R. Dekker (2003) claim that “Reverse Logistics concerns activities associated with the handling and management of equipment, products, components, materials or even entire technical systems to be recovered... ...Recovery can simply be just reselling of a product or it can be accompanied by a series of processes as collection, inspection, separation, and so on, leading to e.g. remanufacturing or recycling”.

We have to point out that there is no generally accepted definition of RL. Basically, we can distinguish between three approaches to RL (Škapa, 2005):

- RL is an activity done primarily by retail companies, and it consists of the re-sale and redistribution of unsold products and product warranties.

Its main task is to fulfill economic (more specifically, financial and marketing) goals.

- RL is almost a synonym for material recycling and waste management, which try to minimize cost, retrieve value from reverse flows, and fulfill legislative and environmental requirements.
- RL is a broader concept for an overall supply chain optimization, whose aim is to support a closed-loop character of supply chains by affecting activities such as product design, supply chain design, and product and material recovery.

The third, and most holistic, approach is currently becoming most widespread, and therefore we will understand RL in this broader sense even for the purpose of this article.

### **The importance of reverse logistics for businesses**

Reverse flows are a natural part of the economy and they cannot be fully avoided. On the contrary, their volume and economic importance has been growing for several reasons, such as stricter environmental legislation or the development of e-business (De Brito, Dekker, 2003 or Rogers, Tibben-Lembke, R., 1999). Jayaraman and Luo (2007) add that businesses' interest in reverse flows and their management is also connected with the development of "corporate citizenship" when businesses try to act as "good" citizens. It is not only environment protection that belongs to the steps perceived positively by the public, but also philanthropy, which in relation to reverse flows includes the provision of functioning (even though used or claimed and repaired) things for charity purposes.

However, economic reasons represent the most frequent motive for RL development; namely: a connection to a customer service, relation to business profitability, increasing costs of RL, excessive inventories or their using up, or competitive pressure from other producers (Gecker, Vigoroso, 2006).

The most frequently cited estimate, carried out by Reverse logistics executive council, claims that costs of RL in USA accounted for half the GNP, which represents 35 billion dollars of costs spent by American companies (Meyer, 1999). Nevertheless, this figure is an average and it has to be pointed out that the extent and thus the importance of RL differ greatly among companies. RL is much more industry specific than forward logistics (de Brito, Dekker, 2003; Marien, 1998). For many companies thus RL poses an area with a high potential for the reduction of their costs.

A broad empirical study by Gecker and Vigoroso (2006), conducted in three continents, gives evidence that up to 61% companies consider RL very important. However, at the same time, up to 60% companies are dissatisfied with their current approach to this issue. In other words, the survey results suggest that there are possibilities for

improving and saving. Mollenkopf *et al.* (2007) identified a similar discrepancy by means of in-depth interviews; this time it was between the strategic and operative planning level. Companies focus even on the issues of reverse flows in their long-term objectives; nevertheless, the topic of reverse flows is most commonly part of other objectives that have a higher priority internally. Customers' satisfaction and loyalty can serve as an example. However, there is no connection with these strategic plans on the operative level. Potential successes in reverse flow processing thus exist despite the low priority of reverse flow management.

## **MATERIALS AND METHODS**

The objective of this article is to check empirically whether even companies operating in the Czech Republic perceive RL barriers, i.e. factors limiting further RL development on the corporate level, similarly to companies abroad.

One of the stated barriers of reverse logistics development is a lack of interest, substantiated by the insignificance of RL. One of possible explanations rests in the fact that it is the top management of companies who talk about the insignificance of RL rather than workers who have a close working relation to RL and who can be expected to know the issue of RL and its implications better. Generalization thus leads us to the second objective of this analysis, i.e. researching whether company experts and top managers have different views of RL barriers. This aspect has not been closely researched and objectified, based on surveys the author has at his disposal.

The following part of this text presents the RL barriers that have been described in foreign surveys. Furthermore, it briefly describes the methodology of empirical research with Czech companies, or companies operating in the Czech Republic (the research thus does not focus on companies owned by Czechs). Survey results then make it possible to formulate conclusions concerning not only the state of barriers in the Czech Republic, but also a more general phenomenon, which is the relation between organizational commitment and RL development.

### **Reverse logistics barriers**

The cited conclusions by Gecker and Vigoroso (2006) on the dissatisfaction with the state of RL in companies make us raise questions what the reason of this state is, and what the "barriers" limiting RL development are. Several surveys were looking for the answer: one of the first surveys was an enquiry in American companies in 1998 (Rogers and Tibben-Lembke, 1999), which presents the relative insignificance of RL (39% respondents), followed by corporate policy (35%), systems incompatibility with company orientation (34%), reasons of competition (33%), and management's lack of interest (26%) as the most frequently mentioned RL obstacle.

Ten years later, Chan and Chan (2008) came up with identical conclusions in a smaller survey among 34 managers of telecommunication companies. Even in this case the first place is held by the relative insignificance of RL, which was stated by a third of respondents. Another limiting factor is a company's restrictive policy in relation to reverse flows, which is caused by the fact that companies do not see positive aspects of RL. A statement that RL is incompatible with a company's current organization and orientation appears here too.

Ravi and Shankar (2005) researched RL barriers and namely the mutual relation between them. The most influential barriers in the descending order are as follows: the lack of awareness of reverse logistics, lack of commitment by top managers, lack of strategic planning, financial constraints, and problems with product quality.

Erol *et al.* (2010) examined similarly structured barrier types in the Turkish environment of companies belonging to four sectors of the industry. However, their findings are different. The highest importance is attached to the barrier of systems incompatibility with a company's orientation and legislative issues. Top management's lack of interest is in the end of the significance order together with the "insignificance of RL".

Janse *et al.* (2009) interviewed 44 representatives of consumer electronics companies and they came up with a list of barriers that is elaborated more thoroughly. The first place is held by the lack of a clear return policy. Following causes they mentioned are as follows: RL is not understood as a factor creating a competitive advantage, a missing suitable system for tracking RL efficiency, insufficient support of RL by IT, and limited possibilities of making predictions and planning.

Let us also mention findings of surveys that dealt with factors affecting the development of RL in the context of so-called Green Supply Chain Management (GrSCM). It denotes a wider range of activities that include besides RL also green product design, green purchasing or even green logistics (Srivastava, 2007). According to surveys by Hu and Hsu (2010) or Lin and Ho (2011), managers' support is the most important factor affecting a successful implementation of GrSCM. On the other hand, barriers of GrSCM development comprise environmental requirement costs, the lack of green awareness (including the lack of top-level management support), technological barriers, and the lack of environmental information, knowledge and trainings (Nikbakhsh, 2009). Sarkis (2011) supplements the barriers and talks about more general groups of factors that involve even external influences. In particular, they are organizational, proximal, political, temporal, legal, cultural, and economic influences.

It is clear from the previous literature survey that the majority of the mentioned barriers are of the internal nature. Even Walker *et al.* (2008) comes up with a similar finding in their literature search.

Current RL barriers are caused by previous decisions made by the top management rather than external circumstances. We can conclude that the state of RL is thus connected with managers' attitudes to reverse flows. Even Alvarez-Gil *et al.* (2007) confirm this finding: they used a sample of 118 Spanish companies to identify a truly strong (and statistically reliable) relation between managers' progressive attitude and the probability that a company will implement programs for RL development.

### The nature of empirical survey

A quantitative approach was chosen for compiling this research, which is exploratory in its nature. The data were collected during 2009 and 2010 in the form of personal interviews. The obtained data thus reflect subjective standpoints of representatives of companies. Wording of questions was based on works by Rogers and Tibben-Lembke R. (1999), De Britto & Dekker (2003), Gecker & Vigoroso (2006) and Klapalová (2007). The final questionnaire included 22 main questions with closed questions prevailing over open ones. The obtained data were processed in IBM SPSS v. 19 software, using frequencies, Spearman's rho, and nonparametric Mann-Whitney U test.

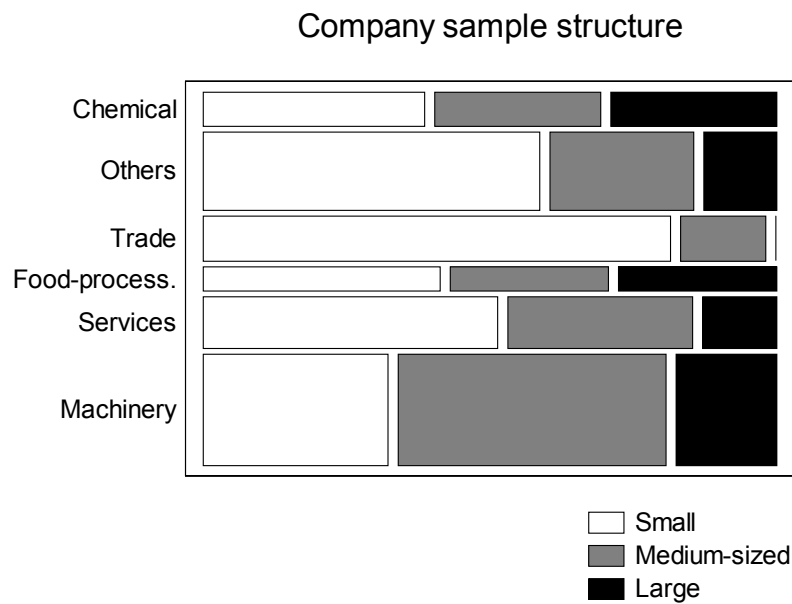
The survey provided us with data concerning 102 companies operating on the Czech market. The final sample consists of relatively heterogeneous companies belonging namely to engineering, services, trade, chemical, and food-processing sectors, based on their industry classification (see also Fig. 1).

## RESULTS

Based on the literature survey, we researched eight barriers connected with a company's internal activity and six external barriers. Their overview and final frequencies are listed in Tabs. I and II (the columns "experts" and "other" are explained in further text).

Compared to the cited foreign surveys, the Czech results represent no major surprise. The low RL priority is the main barrier in the researched Czech companies. Even studies from USA (Rogers, Tibben-Lembke, 1999) or Hong Kong (Chan, Chan, 2008) come up with the same conclusion. The second barrier is the lack of systematic management. It suggests that reverse flows are probably often managed by ad hoc mechanisms, which is not a good approach, as pointed out e.g. by Meyer (1999). *The third barrier (unskilled personnel) is logically connected with the first two barriers as well as with the last one, i.e. the lack of know-how. It is thus unclear why companies fail to perceive know-how as a significant barrier* (Klapalová, Škapa, 2010). A barrier concerning a product typically rests in demand seasonality as well as low-quality materials and components.

Based on specifying open questions, we can say that customers are perceived as the main external barrier because of their careless and unqualified



1: *Company sample structure (n = 102)*  
Source: author

handling with products and packaging, and their pressure on the sale price. Similarly, irresponsible handling with packaging and its low quality is the main problem on the suppliers' side (Klapalová, Škapa, 2010). The impossibility to obtain further financial sources for RL from external subjects is the third most important external barrier. Interestingly, it did not appear in such front positions in foreign surveys.

The obtained (relative) frequencies of answers do not suggest that companies see RL barriers in the internal rather than external environment. In addition, further conducted analyses do not provide us with statistically reliable evidence suggesting differences in the perception of barriers by companies. It is therefore impossible to claim, for instance, that companies regarding their RL as a profit-making or conversely loss-making activity define the barriers differently. Next, no difference

I: *Internal barriers RL (n = 102)*

Internal barriers	Frequencies (Percent)	Experts	Others
failing to see a reason in reverse flows compared to other activities	43 (42%)	30%	50%
lack of systematic management	36 (35%)	36%	37%
staff resources (unskilled personnel)	31 (30%)	27%	32%
product nature	19 (19%)	27%	16%
missing consultancy for the field of reverse flows	18 (18%)	15%	19%
internal financial resources	16 (16%)	16%	17%
conflict with strategy / corporate policy	12 (12%)	6%	15%
lack of know-how	9 (9%)	0%	13%

Source: Klapalová, Škapa (2010), modified

II: *External barriers RL (n = 45)*

External barriers	Frequencies (Percent)	Experts	Others
customers	45 (44%)	46%	44%
suppliers	29 (28%)	23%	31%
financial resources	29 (28%)	23%	31%
legislation	23 (23%)	15%	29%
intermediaries of various services concerning reverse flows	20 (20%)	15%	21%
government's interest – politics	14 (14%)	15%	13%

Source: Klapalová, Škapa (2010), modified

was found within the companies of different size. Due to the high heterogeneity of industry affiliation combined with the small sample, it was not reasonable to identify the industry-specific barriers.

As it was mentioned in the literature survey, the cited research studies focus on the issue of RL barriers and disregard the impact of a respondent's professional position. Therefore another analysis deals with this problem. The fact that there is a difference in the perception of barriers between top management and an RL expert serves as the initial premise. If we accept the hypothesis that experts know better the RL matters and especially connections between RL and other company activities, we can expect that the opinion that a barrier to the development of RL is its relative little importance will be less frequent.

Because of this analysis, the respondents were divided into two groups depending on whether RL is a direct component of their work, i.e. if they can be considered as "experts" or top managers. The first group thus includes the respondents who stated in the questionnaire that they work as managers or experts in logistics, claims, operations, production, or customer service. The research sample contained 33% of such answers. All the other respondents, i.e. CEOs or finance and business managers, were in the second group: top management (67%).

Having carried out Pearson's chi-square tests concerning differences in the perception of the barriers, we did not find any statistically relevant difference between experts and top managers. However, the only exception was the discussed barrier of "failing to see a reason in reverse flows compared to other activities". In this case Pearson's chi-square = 3.28,  $df = 1$ ,  $p = 0.07$ , which signals a certain dependence probability. With respect to our premise that top managers will quote this barrier more frequently than experts, we therefore verified the relation and its closeness with Spearman's rho; the results support the premise:  $\rho = 0.18$ ,  $p = 0.036$  (1-tailed). The difference is clear even in a contingency table (see Tabs I. and II.): this barrier was quoted by 30.3% experts. However, it was 50.3% of top managers.

Our initial hypothesis that experts see the barriers differently from top managers proved valid only partially – in one of 14 barriers. Nevertheless, even

this one barrier is important because it speaks volumes about the relative importance of RL in companies, or how is its importance seen by top managers and experts who are supposed to know this issue better.

We should complete this found different view of the importance of RL with results of a detailed analysis. This time we were comparing answers to a question that investigated the power of factors influencing customers' purchasing decisions. It is thus a view of the importance stemming not from internal motives but importance for external subjects. The seven researched influences included also an "approach of a seller to reverse flows", meaning e.g. helpfulness during claims of goods or the speed of a seller's RL. The answers were marked in ranges 1 (strongly not important) to 7 (strongly important).

The result of Mann-Whitney U test ( $U = 858$ ,  $p = 0.04$ ) reveals that even here the experts quoted a higher impact of RL on purchasing decisions than the top managers (see Tab. III). In our opinion, this finding also supports the statement that the knowledge of RL issues is connected with the importance that employees attach to it.

## DISCUSSION

Research into RL barriers in the Czech environment provided very similar results to those from foreign studies. The only significant difference is a higher importance of barriers connected with the lack of finances for RL development (an internal barrier) and the impossibility to obtain them from external sources (an external barrier).

We can compare our results with barriers that are relevant for the entire supply chain management (whose part is also RL). It enables us to see a clear difference in company priorities. The lack of means for supply chain management is quoted in the last place as a barrier (Fawcett *et al.*, 2008), which implies that this issue is not regarded as an insignificant activity. On the contrary, supply chain management is nowadays one of the main activities that do not suffer from the lack of finances, which, however, is not true for RL.

Even Mintzberg (1973) pointed out the general fact that top management's commitment is important when enforcing changes in a company.

III: *The view on purchasing factors*

	Average for Experts	Average for Others	Mann-Whitney U	Sig. (2-tailed)
Cost reduction	4.92	4.59	734	0.008
Price	5.50	4.79	739.5	0.003
Service quality	5.92	5.90	814	0.013
Product-related characteristics	5.33	5.31	164	0.658
Approach of a seller to reverse flows	5.83	4.31	858	0.042
Delivery speed	5.67	4.93	792	0.013
Assortment width	4.50	4.62	971.5	0.526

Source: author

Prahinski and Kocabasoglu (2008) add that the relation between companies' interest in RL (so-called organizational commitment for this field) and its efficiency is proved by many studies; nevertheless, the causality of this relation is not fully described. The presented article also contributes to this discussion besides listing the RL barriers.

The second objective of this article involves a question if the perception of RL importance is connected with the knowledge of RL. We inferred the RL knowledge (in a simplified way) through work positions of the respondents. Our initial hypothesis was that experts' knowledge and experience with this issue is higher, and therefore their opinions will differ from opinions of top management. This premise was verified although only to a limited extent. We can concretely claim that the perception of RL importance was higher in the group of the experts. Being cautious about the claim, we can also say a hypothesis that further RL development in companies can be achieved if top management's knowledge of RL could be developed; it is especially the knowledge of its benefits either in a form of saved costs or directly through additional sales. The author of this article is not aware of the fact that this

relation (i.e. work position vs. perceived importance of RL) was dealt with by another empirical study.

To be precise, we have to point out that the research method we chose has several limitations. Besides the above-mentioned premise concerning the experts' higher knowledge of the issue, it is also a small research sample consisting of 102 companies. In addition, we take into account an opinion by just one company representative and use it to compare different companies. It would be ideal if we could obtain at least two opinions from each company – one from a top management representative and the other from an expert – and had the opportunity to test the difference in their views. It would enable us to research the difference in opinions of these two respondents in comparison to other characteristics of the companies. For instance, it would be possible to conduct an analysis of opinion differences only for those companies where reverse flows represent big volumes and thus are highly significant, or just for companies where RL does not play an important role. Another alternative would be to research opinion differences in relation to a corporate culture.

## SUMMARY

Reverse flows (like claimed, used or unsold products and packaging) are a natural part of the economy and they cannot be fully avoided. Several survey results suggest that there are possibilities for improving the effectiveness of reverse flow management, i.e. reverse logistics (RL). The first objective of this article is to check empirically whether even companies operating in the Czech Republic perceive the factors limiting further RL development on the corporate level, similarly to companies abroad. The second objective is to find out whether company experts and top managers have different views of RL barriers. This aspect has not been closely researched and objectified so far.

A quantitative approach was chosen for compiling this research. The data were collected during 2009 and 2010 in the form of 102 personal interviews among representatives of Czech companies.

The Czech findings represent no major surprise compared to the foreign surveys: The low RL priority is the main internal barrier in the researched Czech companies. The customers are perceived as the main external barrier because of their careless and unqualified handling with products and packaging, and their pressure on the sale price. The only significant distinction between the Czech and foreign results is a higher importance of barriers connected with the lack of finances for RL development (an internal barrier) and the impossibility to obtain them from external sources (an external barrier).

Because of the second aim of the paper, the respondents were divided into two groups depending on whether RL is a direct component of their work (experts) or not (top managers). The initial expectation that experts see the barriers differently from top managers proved valid only partially – in one of 14 barriers. Nevertheless, even this one barrier is important because it speaks volumes about the relative importance of RL in companies, or how is its importance seen by top managers and experts who are supposed to know this issue better.

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## Address

Ing. Radoslav Škapa, Ph.D., Katedra podnikového hospodářství, Ekonomicko–správní fakulta, Masarykova univerzita, Lipová 41a, 602 00 Brno, Česká republika, e-mail: skapa@econ.muni.cz

