

## SUSTAINABILITY – KEY FACTOR FOR INTEGRATED SUPPLY CHAINS

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**ABSTRACT:** The main goal of this research is to determine the advantage of the companies which are using reverse logistics in recycling used household appliances in order to protect the environment, compared with other companies that do not deal with the recycling of old products, over a segment of population in Romania, between the ages of 25 and 44. Based on existing studies regarding the impact of reverse logistics on the consumer and the environment, we intended to ascertain: the spontaneous notoriety of retailers of household appliances who recycle the used products, the impact that sales offered by retailers of house appliances in case people bring the used products when they want to purchase new ones, the impact of specialized stores which recycle used house appliances on the purchasing decision, and also the degree of the intention of purchasing house appliances from retailers that recycle used products, over a segment of population in Romania, aged 25 to 44.

**KEYWORDS:** sustainability, house appliances, used products, reverse logistics

### 1. INTRODUCTION

Due to an increase in business competitiveness on a market where the real differences between products are increasingly smaller, companies were obliged to develop consumer-friendly services: “if you are not satisfied, we’ll give you a refund”, “guaranteed satisfaction”, “use it, and you won’t get the desired results in 60 days, we’ll receive it with no questions asked”. From the client’s perspective, these are privileges and rights that allow him to enjoy a higher quality of service. But what do all these entail for the company [11]? Reverse logistics handles the influx of goods from consumer to the place of origin in order to recover a part of the initial value or to give it a more appropriate use [12].

Inside the supply chain, returning the goods is of great importance due to the fact that this entails not only returning the product to the company, but also resending it to the customer. In most of these cases there is a considerable logistics cost added on top of client dissatisfaction that are at the same time damaging the company’s image [14].

Nowadays the society and market demand increasingly eco-friendly attitudes and actions from the companies, which is evident through such specific legislation [4]. There are regulations in Europe, the United States of America, and Japan regarding the prevention of wastes and also the promotion of waste recovery by refurbishing, recycling, and remanufacturing goods, including materials, electronics, batteries, chemical products, glass, paper, plastic, and heavy metals [8].

Another consequence of the development of backward flow is due to recycling and waste disposal [6]. The company has to adapt its actions to the environmental regulations while also taking into consideration the increasing competition [11]. The responsibility over the goods that fell into disuse falls upon the producer. According to the concept of “extended producer responsibility” defined as “an environmental protection strategy to reach an environmental objective of a decreased total environmental impact from a product, by making the manufacturer of the product responsible for the entire life-cycle of the product and especially for the take-back, recycling and final disposal of the product” [10].

Normally the company’s main concern would be delivering goods from the producer to consumer. Later, aspects such as after-sales service and building consumer relationships have been taken into account. The best-known form of after-sales service is product returns: goods that consumers believed were not worth their money. This growing concern for the

environment engendered a reputable process of recycling. Insufficient attention towards the welfare and preservation of natural resources seems to stir up dissatisfaction amongst consumers [18]. Backward flows existed since time immemorial but they were never given much importance until today. If we were to refer to industries such as the automotive industry or the home appliance industry, these have always been returned to handlers or producers for repair or replacement. Nevertheless, the importance of this type of service has increased considerably in the past decades [6].

In marketing, influencing users to desire products and green supply chain services is a challenge, but it is also a trend the consumer and investor have adopted [9]. What matters is that reverse logistics is a new form of fulfilling consumer needs [6]. Stimulating the purchase of recyclable materials by companies is as essential as retrieving them. Moreover, increasing consumer demand for these goods is important. Using recyclable materials will contribute to waste minimization and also to raw material salvaging [14].

Sustainability has transformed into a key factor for the supply chain management of distribution and assets. This new integrated supply chain has to take a few parameters into consideration such as: eco-efficiency that entails reduced energy usage and reduced CO2 emissions. Moreover, reducing costs for handling and transportation, delivery time, and increasing stock availability in stores [14].

Nowadays, the modern environmental management stipulates certain durable production strategies which focus on preventing wastes and on responsible tending towards the earth's natural resources. There's a challenge in the electronics industry to be successful from both ecological and economic standpoints. Electronics manufacturing processes are designed to make products from scratch. Producers could make a profit by including recyclable materials in the manufacturing process. Recycling home appliances is similar to recycling automobiles due to the metals of their composition [9].

The most significant aspects in which companies employ reverse logistics focused on social responsibility are environmental protection, benefiting the community, and productivity [5].

## 2. STUDIES REGARDING THE IMPACT OF REVERSE LOGISTICS ON CONSUMERS AND ENVIRONMENT

Most studies carried out in recent years regarding reverse logistics highlight its importance in reducing the manufacturing cost owing to the recycling of used materials that couldn't be salvaged.

On the other hand, the advent of reverse logistics has two other great causes: benefiting consumers and protecting the environment. The literature offers a few studies pertaining to the impact of reverse logistics on consumers and the environment.

**Table 1.** Literature review concerning the impact of reverse logistics on consumers and the environment

No.	Authors	Year	Results
1.	Agrawal S., Singh R., Murtaza Q.	2015	The implementation of legislation, company image, environmental protection, and the economic benefits force companies to not only adopt reverse logistics, but also be efficacious.
2.	Kinobe J. R., Gebresenbet G., Niwaqaba C. B., Vinneras B.	2015	Reverse logistics can be beneficial to the environment if implemented in a sustainable manner.
3.	Shaik M., Kader W.	2012	There has been an increase in consumer awareness regarding the importance of recycling.
4.	Skinner L. R., Bryant P. T., Richey R. G.	2008	Consumers nowadays are increasingly preoccupied with environmental matters. Therefore, a good policy regarding return logistics is indispensable for the retailer's success.
5.	Ballesteros D. P., Ballesteros P. P.	2007	Through the medium of reverse logistics we can salvage and keep what's left of the environment.

6.	Mihi A.	2007	The main international trend in reverse logistics entails environmental protection, reducing the number of returned goods, and the increasing interest in capturing value invested in manufacturing. The company will be able to generate competitive differences through promoting images displaying responsibility towards the environment, by producing recyclable goods made of salvaged materials, which diminishes the production of wastes and the usage of nonrenewable raw materials.
7.	Fernández I., García N.	2006	Eco-Management and Audit Scheme Certification seems to prejudice companies against major compromises such as adopting a system of reverse logistics.
8.	Srivastava S. K., Srivastava R. K.	2006	Returns on a global scale have three main causes: reducing costs, laws, and consumer pressure. Reverse logistics improves customer service, leading to an increase in the number of customers.
9.	Vellojin L. C., Meza J. C., Mier R. A.	2006	The client is a key factor in reverse logistics. The manner in which a consumer views dealers and the added value they offer are important factors in decision-making.
10.	González J., González O.	2001	Protecting the environment more and more and the necessity of offering a competitive after-sales service generate important fluxes of materials and goods in the opposite direction from the traditional way of distribution, i.e. from consumer to producer.

Due to the rising population and higher consumption rates, recovering natural resources from an industrialized society has become vital for a long life. As the natural resources are dwindling, the value of used products is rising. To overcome this problem, reverse logistics, which simply represents the process of recovery of used goods, comes to its help. The economic crisis distressing most communities in emerging countries represents another reason for recycling, which is now seen as a method of making profit [8].

In the future all companies will have to take care of the manner in which their products affect the environment. At the moment they abide by the rules regarding used home appliances from the countries in which they are selling their products. Logistics is the key to performance on a daily basis and reverse logistics is crucial for companies to survive, considering that their prestige is at stake [13].

We have analyzed in this research the advantage companies that use reverse logistics in recycling home appliances have, the attitude that the Romanian population aged 25-44 has regarding retailer companies of home appliances pertaining to the recycling of used products in order to protect the environment, but also the influence these have on decision-making.

### 3. RESEARCH OBJECTIVES

**Main objective:** establishing the advantage companies that use reverse logistics for the recycling of used home appliances in order to protect the environment have compared with the rest of the companies that do not recycle old products among the population of Romania aged 25-44.

These are the **secondary objectives** as following:

- A. To establish the spontaneous notoriety of retailers of home appliances who recycle used products, in the case of the Romanian population aged 25-44.
- B. To ascertain the impact of sales offered by retailers of home appliances in the case of the Romanian population aged 25-44 provided they bring their used products when they want to buy new one.
- C. To ascertain the impact of recycling used home appliances by specialized stores it has on consumer's buying decision, in the case of the Romanian population aged 25-44.
- D. To determine the degree of the purchase intention of home appliances from retailers who recycle used products, in the case of the Romanian population aged 25-44.

## Hypotheses

We have summarized the following conclusions from literature review:

<i>The company will be able to generate competitive differences through the medium of promoting an image of responsibility regarding the environment, by manufacturing recyclable goods from salvaged materials, which decreases the waste generation and the use of nonrenewable raw materials [11].</i>	<b>H1: Retailers of home appliances who recycle used products have a higher notoriety than other retailers.</b>
<i>The implementation of legislation, the company image, environmental protection, and the economic benefits force the companies not only to adopt reverse logistics, but also be efficacious [1].</i>	
<i>Through the medium of reverse logistics we can salvage and keep what's left of the environment [2].</i>	

We have summarized the following conclusions from literature review:

<i>Reverse logistics can have benefits on the environment if implemented in a sustainable manner [8].</i>	<b>H2: Home appliance retailers who recycle used products have an increase in sales than those who don't recycle.</b>
<i>Consumers nowadays are increasingly preoccupied with environmental concerns [16].</i>	
<i>The form in which consumers perceive their dealers and the value added are factors in purchase decision [18].</i>	

We have summarized the following conclusions from literature review:

<i>Reverse logistics improves customer service, leading to an increase in the number of customers [17].</i>	<b>H3: The existence of campaigns regarding old home appliances makes consumers invest the money in new ones.</b>
<i>The form in which consumers perceive their dealers and the value added are factors in purchase decision [18].</i>	

## 4. METHODOLOGY

### 4.1 Research design

The research is a conclusive one, since it is a descriptive research employing the survey method. Therefore, there has been a survey through which we have analyzed the advantage companies which use reverse logistics for recycling home appliances, the attitude the Romanian population aged 25-44 has towards home appliances retailers' campaigns regarding the recycling of used products in order to protect the environment, but also the influence these have on the purchasing decision-making.

### 4.2. Reference population

The target population is the population in Romania aged 25-44. This has been structured by gender.

**Table 2.** Romanian population aged 25-44

<b>Age/Gender</b>	<b>Female</b>	<b>Male</b>
25-29 y.o	1391208	721897
30-34 y.o	1389833	712599
35-39 y.o	1590162	812587
40-44 y.o	1554235	796843
<b>Total</b>	5925438	3043926

Source: [http://media.hotnews.ro/media\\_server1/document-2014-09-8-18060280-0-populatia-stabila-romaniei-1-ianuarie-2014.pdf](http://media.hotnews.ro/media_server1/document-2014-09-8-18060280-0-populatia-stabila-romaniei-1-ianuarie-2014.pdf)

#### 4.3. Type of survey

In order to be objective in choosing the participants, this research employed quota sampling. This method is frequently used due to the facility and representativeness of the sample across the entire targeted population.

#### 4.4. Sampling: volume and structure

The chosen variables are gender and age. We have chose age because it can influence behavior regarding recycling home appliances, and gender because it can be important in the case of campaigns regarding used home appliances.

### 5. DISCUSSION

Testing hypotheses has been done as a correlative of the proposed objectives.

Therefore, in order to test the first hypothesis related to the first objective, the respondents had to name the home appliances stores they know recycle products. Therefore, the frequency of answers (88%) was oriented towards the store which constantly has campaigns regarding recycling old products, thus confirming hypothesis H1.

By correlating the second objective to hypothesis H3 leads to the fact that when they see discounts given by such stores, 36% of the respondents wish to bring old home appliances, and they prefer to use the ticket received to buy a new product. A percent of 28% were prudent people who wish to find out more information regarding the sale. 20% of the respondents prefer bringing old home appliances they no longer use, but at the same time they keep the ticket with the discount in order to use it later when they truly need new home appliances. A percentage of 16% of those surveyed think nothing of this type of campaign.

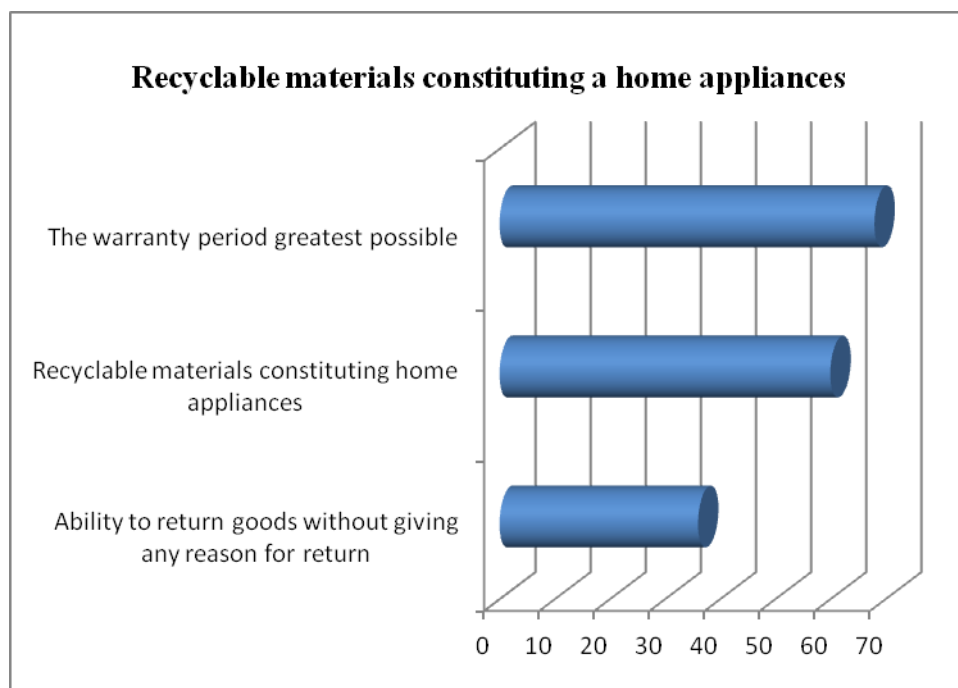
**Table 3.** People's reactions concerning the discounts offered by home appliances store in case they bring an old product in exchange

<b>Reactions</b>	<b>Percentage</b>
<b>You bring old home appliances and buy new ones</b>	36
<b>You bring old home appliances, but you don't buy new ones</b>	20
<b>You find out more information regarding the sale</b>	28
<b>You think nothing of it</b>	16

Since the highest percentage, 36%, refers to people who wish to bring their old home appliances in order to use the discount received to buy new ones, our hypothesis H3 is confirmed.

Objective C – Determining the impact of recycling used home appliances by specialized stores on purchasing decision among citizens of Romania aged 25-44 – has been correlated with hypotheses H2 and H3. Of the three elements respondents had on hand, when they buy a

home appliance they wish a longer defect liability period, garnering 68 points. The runner up with 60 points in people’s preferences is the home appliances that have recyclable materials in their composition. The least score was attributed to the possibility of returning the product without stating the reason of return, garnering only 36 points.



**Figure 1.** Recyclable materials constituting a home appliances

The sentence “*Home appliances stores that employ recycling old products protect the environment*” received the highest score – 4.2. This shows that respondents tend to completely agree that home appliances stores that recycle the old products protect the environment.

The sentence “*I buy home appliances from stores that recycle old products because this way I contribute to protecting the nature*” received a score of 4.02. This shows that respondents tend to completely agree, namely they desire to contribute to protecting the environment, and one way would be buying home appliances from stores that recycle the used ones.

A score of 4 was received by the sentence “*I buy home appliances from stores that recycle old products because the new products are made of recyclable materials*”, aspect which people tend to agree on, namely that home appliances from stores that recycle old products seem to be made of recyclable materials.

The last sentence “*I buy home appliances only from stores that recycle old products*” got the lowest score – 2.98. This shows that people tend to be more indifferent to this statement.

Considering that the first three sentences registered scores over 4, which means that people agree or completely agree that home appliances stores which recycle old products protect the environment, but also that they purchase home appliances from stores that recycle old products due to the fact that they contribute to protecting the nature or that the new products are composed of recyclable products. The sentence that got the least score, 2.98, shows that respondents are indifferent to the fact that they purchase home appliances only from stores which recycle old products.

Considering that people are interested in their products to have recyclable materials – this obtained 60 points – and since there is a small difference between the first element people take into consideration when purchasing home appliances, this results is the confirmation of hypothesis H2. An average number of people agreed that people tend to buy home appliances – 6.28. Since it is very close to the maximum value, 7, this shows that in case the same product cost the same in a store that recycles old products and another one that doesn’t, people prefer to buy products from the store that recycles.

Considering the fact that the product has the same price in the two stores, people prefer to buy from the one that recycles; this results that hypothesis H2 is confirmed.

The objective **To determine the degree of the purchase intention of home appliances from retailers who recycle used products, in the case of the Romanian population aged 25-44.** Of the existent options, buyers are most interested in sales offered by shops in which they exchange their products; this received the highest average – 2.19. The next average from a descending order is 2.13 and refers to the importance of home appliances stores recycling used products. Of the three options, it seem that the possibility of returning old home appliances that people no longer use to such stores obtained the lowest average of only 1.76. Due to the fact that between the three elements mentioned above, the importance of sales offered by shops in which they bring old home appliances garnered the highest average, 2.19, leading to the confirmation of hypothesis H3.

**Table 4.** Average values of the degree of purchase intention of home appliances from stores that recycle these

	Answers							Total	Average
	1	2	3	4	5	6	7		
They don't make you want to buy their products/ they make you want to buy their products	4	3	5	17	22	28	21	100	5.18
They don't make use intend to buy their products/ they make you intend to buy their products	7	2	4	8	30	24	25	100	5.24

The average of 5.18 from Table 4 shows that people tend to desire to buy home appliances from stores that recycle used products, and the average of 5.24, which is quite close to the maximum of 7, shows that these stores make people intend to buy their products.

**Table 5.** Average values of degree of purchase intention as compared with the importance of feelings given to home appliances found in stores that recycle used products

Attribute	Average	Rang	Rang	Average	Attribute
They don't make you want to buy their products/ They make you want to buy their products	5.18	2	2	4.97	The importance of making them want to buy their products
They don't make you intend to buy their products/ They make you intend to buy their products	5.24	1	1	5.27	The importance of making them intend to buy their products

We infer from table 5 that firstly, home appliances stores that recycle used products make the consumers intend to buy their products – its importance is on the first place with an average of 5.27. Secondly, this type of stores make people want to buy their products, which we infer from the average of 5.18, and also the importance of such aspect is found on second place with an average of 4.97.

Considering that the intentional dimension of attitude registered averages of 5.18, and 5.24 respectively, quite close to the maximum value of 7, we infer that home appliances shops make people want to buy and intend to buy their products, thus confirming the hypothesis H2.

## 6. CONCLUSIONS

On a market where all products have the same quality and approximately the same price, it's important that retailers brought something new to set themselves apart from other companies, making the customers choose them instead of other retailers.

The increasing concern towards environmental protection could form the basis of a new source of profit for retailers of home appliances.

At first glance, there is no connection between the environment and home appliances stores. But if we think about the fact that people nowadays focus their attention towards the attempt to protect what's left of the environment, we can say that companies showing their interest for the nature, setting themselves apart from the competition, have a competitive advantage. This

occurs mostly in the case of home appliances stores which deal with recycling used products, covering one of the people's need: to protect nature.

Most buyers of home appliances are aged 25-44 because people from this category have an income and also need these products, and they prefer to invest money in them. Taking this into account, we have applied our research to a sample of 1000 people, of which 51% are women and 49 % are men, aged 25-44.

In order to answer the survey, people had to pass through two filter questions. The first one referred to the age of the respondents for them to match the abovementioned sample, and the second one was to select only people who have bought at least one home appliance in the past six months.

Due to the fact that we desired to create a survey as precise as possible that we could apply in the most appropriate places, we have created a focus group through which we learned that people prefer to shop at Flanco, Altex, and Domo stores on Thursday, Friday, and Saturday between 4 pm – 6 pm. At the same time, we have established the emotions associated with the home appliances retailers' campaigns for recycling used products, in the case of Romanian population aged 25-44. Therefore, we have applied our survey in the proximity of these three stores, Flanco, Altex, and Domo, from Thursday to Saturday, in the abovementioned time interval, in order to meet as many respondents in a short period of time.

According to the results of the research, it seems that home appliances retailers that recycle used products have a spontaneous notoriety greater than those who do not recycle these. Therefore, in the top of the list is Flanco: it is the only store that has constant campaigns regarding the recycling of old home appliances. After that there is Altex and Domo, two stores that offer a few times a year discounts on new products provided that people bring big home appliances that they no longer use.

It seems that the existence of discounts, which people encounter in home appliances stores provided they bring appliances they no longer use, make most of them bring old appliances to buy new ones, using the discount they received. Many other are interested in the offer and prefer to find out more information on it, and the fewest people either bring the old appliances to get the discount ticket they might use later, or they think nothing of the campaign.

When making the purchase decision, people who wish to purchase home appliances are increasingly choosing products that are comprised of recyclable materials, owing to their concern for the future of the environment.

Another important element people take into consideration when choosing the store from which they buy home appliances would be the discounts offered by the retailers provided they bring in used home appliances, but also that these stores not only commercialize products, but also recycle them when people no longer need them, be it that these products are too old, that they no longer function, or that they no longer cater to their needs.

Results show that people also believe that stores which recycle old products do it in order to protect the environment. Therefore, there is a category of people who prefers purchasing home appliances only from stores that deal with their subsequent recycling. As a consequence, it is said that home appliances retailers can profit from the people's concern for nature by fulfilling their need in this respect, but at the same time bringing benefits to the producers who will be reusing the recycled materials.

At the same time, it seems that people who buy home appliances from stores that deal with the recycling of old products because they believe they contribute to protecting the nature, or because they believe such products are made of recyclable materials that can be later reused. As for the purchase intention of home appliances from stores that deal with not only the sale but the recycling of used products, research shows that these stores make most people intend to buy, and make others desire to buy them.

When people were made to decide between buying a home appliance that has the same price in a shop that deals with the recycling of used products and another one interested solely in sales and not about what will happen to such appliances when they no longer use them, most people said they would absolutely buy from the retailer that deals with their subsequent recycling.



This means that home appliances stores that recycle used products have a greater notoriety than other retailers from the same domain, and also that the existence of old home appliances campaigns makes consumers invest their money in new ones, and also that home appliances retailers dealing with the recycling of used products have higher sales than those who do not recycle.

In conclusion, reverse logistics can be seen as a new way of bringing competitive advantage to stores that commercialize recyclable products. Considering that this type of logistics allows setting retailers who recycle old home appliances apart from those who don't, it is said that they fulfill a new need of the consumers that is increasingly present in their mind: the need to protect the environment. Therefore, people prefer to purchase products from such stores due to the discounts they receive provided they bring in the old home appliances that they no longer use or due to the fact that they prefer stores that deal with recycling products and not just selling them; both cases bring higher sales to retailers.

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