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Unit packets on the e-commerce market as assessed by potential users – research results

Opakowania jednostkowe na rynku e-commerce w ocenie potencjalnych użytkowników – wyniki badań

Abstract

The growing popularity of online shopping contributed to an increase in the amount of packaging used, and consequently packaging waste. With regard to packaging used for online shopping, there is a need to create conditions for full recycling and/or multiple use. Thus, enterprises operating in the area of e-commerce, and consequently also the customers who would be responsible for the return of packaging, face a challenge – the use of reusable packaging. The article presents the results of own research focused on the position of customers in relation to the functional features of unit packaging in e-commerce and returnable packaging that can be introduced. The tool was a questionnaire. The results were analyzed in statistical analysis. The study shows that it is important for customers who buy online that the unit transport packages fulfill the basic protective functions. The respondents indicated that returnable packaging should have similar features as the packaging currently used in online shopping. It seems that more attention should be focused on determining the method of return that is convenient for customers. Redesigning supply chains to improve reverse logistics, investing in new returnable packaging for online distribution of products, and creating customer-friendly and cost-effective return processes can deliver the following benefits: less waste, reduction of the carbon footprint, promoting a circular economy, cost optimization.

Keywords:

e-commerce, reverse logistics, packaging, packaging features, reverse packing, analysis of packing features

Streszczenie

Rosnąca popularność zakupów internetowych przyczyniła się do wzrostu ilości zużywanych opakowań, a co za tym idzie odpadów opakowaniowych. W odniesieniu do opakowań wykorzystywanych do zakupów internetowych istnieje potrzeba stworzenia warunków do pełnego recyklingu i/lub wielokrotnego użytku. Tym samym przedsiębiorstwa działające w obszarze e-commerce, a co za tym idzie, także klienci, którzy odpowiedzialiby za zwrot opakowań, stają przed wyzwaniem – wykorzystaniem opakowań wielokrotnego użytku. W artykule przedstawiono wyniki badań własnych ukierunkowanych na pozycję klientów w odniesieniu do cech funkcjonalnych opakowań jednostkowych w e-commerce oraz możliwych do wprowadzenia opakowań zwrotnych. Narzędziem był kwestionariusz ankiety. Wyniki poddano analizie statystycznej. Z przeprowadzonych badań wynika, że dla klientów dokonujących zakupów online ważne jest, aby jednostkowe opakowania transportowe spełniały podstawowe funkcje ochronne. Respondenci wskazywali, że opakowania zwrotne powinny mieć podobne cechy jak opakowania stosowane obecnie w zakupach internetowych. Wydaje się, że więcej uwagi należy poświęcić określeniu dogodnej dla klientów metody zwrotu. Przeprojektowanie łańcuchów dostaw w celu usprawnienia logistyki zwrotów, inwestowanie w nowe opakowania zwrotne do dystrybucji produktów online oraz stworzenie przyjaznych dla klienta i efektywnych kosztowo procesów zwrotów może przynieść następujące korzyści: mniej odpadów, zmniejszenie śladu węglowego, promowanie gospodarki obiegu zamkniętego, optymalizację kosztów.

Słowa kluczowe:

e-commerce, logistyka zwrotów, opakowania, cechy opakowań, opakowanie zwrotne, analiza cech opakowań

JEL: O30, Q00, Q50

Introduction

The popularity of online shopping has been growing for years, which contributes to the increase in the amount of used packaging (Jerzyk, 2017; Pluta-Zaremba & Cichosz, 2016). The Gemius report (Gemius, 2021) shows that 77% of Polish Internet users shop online. The pandemic influenced the way of making these purchases – 1/3 of the respondents buy more products online, and almost 1/3 order more products online than before the pandemic. As a consequence, the amount of packaging waste is growing (Bartczak, 2016), and thus the problem of packaging management and/or reuse is becoming more and more important for companies operating in the area of e-commerce, which should look more closely at reverse logistics processes. This requires the recognition of customer expectations in this regard so that the activities undertaken by enterprises are consistent not only with the idea of sustainable economic development, but also with the preferences of buyers. The article briefly presents the essence of reverse logistics to show the functions of packaging and the results of own research focused as assessed of customers in relation to the functional features of unit packaging in e-commerce and returnable packaging which can be introduced. The aim of the article is to indicate the expectations of online buyers as to selected parameters of returnable packaging (i.e. including material of manufacture, packaging size, packaging method, type of closure, convenience of use)¹. The authors put forward the thesis that younger respondents (<30 years old) will pay more attention to aesthetic and ecological aspects of packaging (e.g. colors, biodegradability of packaging, convenience in use), and for older respondents (> 30 years), safety issues will be more important as well as usability of the package (e.g. exposed protective function, information about not throwing the package, possibility of re-use, etc.). The analysis is based on the age of the respondents. The conclusions of the study may be helpful in designing reverse logistics solutions.

Reverse logistics

The issue of managing the delivery of products from the customer to the enterprise is widely present in the world literature as the area of reverse logistics (i.a. Chan & Chan, 2008; Li & Olorunniwo, 2008; Srivastava, 2008). Reverse logistics has increased its popularity in recent years due to several factors which have become important in the modern economy: sustainable development, minimizing costs and changing consumption habits

(which is closely related to the very dynamic development of e-commerce) (Knauf Industries, 2021). The similar position is taken by DHL Trend Research experts who diagnose that three main trends are responsible for changes in the packaging market: the development of e-commerce and last mile logistics, focus on customer experience related to packaging (its comfort, but also satisfaction) and the growing emphasis on implementation by the company's policy of sustainable development and striving to reduce resource consumption and environmental pollution (DHL, 2021).

According to the Council of Logistics Management, reverse logistics is a broad term that refers to the logistic management of the skills and activities involved in recycling, managing and disposing of product and packaging waste. It includes reverse distribution, which causes the flow of goods (in disposable or reusable packaging) and information in the direction opposite to the basic logistic activities (Berg, 1993; Szofitysek, 2009).

Two trends can be noticed in the perception of reverse logistics:

- 1) European, assuming that the beginning of reverse logistics is a consumer who, when consuming a given good, produces its residues and disposes of packaging (an object with a specific economic² or ecological³ value) (Korczak, 2012);
- 2) American, defining it as the process of planning, implementing and controlling the cost-effectiveness of the flow of raw materials and materials, inventories in production, finished products and information related to them, in order to recover value or correct disposal (Rogers & Tibben-Lembke, 1998); it covers both the channel through which the products return (often in the same way) to the producer, and the additional channel in which the process of sorting, recycling and disposal ending the life of the product takes place (Korczak, 2012).

Considering the flow of product packaging in the supply chain, the American trend – having a wider context – seems to be more rational for practical implementation in the conditions of e-commerce development in many industries. Packaging flow planning in reverse distribution should be done at the logistics planning stage in general. Focusing on optimizing the costs associated with the return of packaging is one thing, but it is equally important to plan and implement a packaging recovery process so that it follows the path from producer to end customer and back, potentially continuously. This area of logistics also includes the collection of the products returned by the end customer and their preparation for re-introduction to the market. Moreover, it requires creating (or selecting from

among the available on the market) environmentally friendly packaging (Walaszczyk & Siodłowska 2018) and persuading the customer to use them. It is the final buyer who will be responsible for the return of the packaging (Kucia, 2020; Nalewajek, 2016), therefore it is important that the return process is affordable, and the packaging itself is not only market-optimal (as discussed later in this article), but also consistent with customer expectations.

Packing functions

Proper packaging of goods in the logistics process is one of the most important conditions for safe storage and on-site delivery. The main functions of packaging include (Trans-Tok Logistic, 2021):

- production – the packaging enables the fulfillment of specific production standards and the implementation of production as well as easy preparation of the goods for further shipment;
- marketing – the packaging makes it possible to distinguish products from the competitors' goods (builds brand awareness among the target group's customers), and also encourages the customer to buy;
- usable – the possibility of using it for other purposes, e.g. reusable packaging;
- logistics – packaging is necessary for the optimal implementation of logistics processes⁴.

According to the EU Directive 94/62/WE, packaging can be classified as follows (Mecalux, 2021):

1. Commercial (basic) packaging is used to store and protect the product – it has direct contact with the products and allows to keep it in optimal condition. It is also the smallest portion of the product intended for unit sale and should be packed in a package with the smallest possible amount of material. Their main features include:
 - enabling the identification of the product in accordance with applicable regulations, indicating information on use and other relevant data (e.g. expiry date),
 - helping in brand identification and attracting the consumer's attention,
 - ensuring stability in the place of display in the store (the goods must remain in the shelf), isolating the contents (and protecting the environment against the impact of the goods on the environment).
2. Collective packaging contains a certain number of unit packages – it provides additional protection and facilitates the sale of the product on a larger scale. For this purpose, mainly cardboard boxes, less often made of plastic, are used. Features of collective packaging:

- they can be stacked (in a warehouse or point of sale) and protect products against damage during transport,
- contain a certain number of products,
- attract the customer's attention – this applies in particular to collective packaging intended for direct sale.

After use, they most often become waste and are no longer of interest to the supply chain coordinator.

3. Transport packages contain a certain number of commercial or collective packages forming a load unit (the most common ones include: pallets, containers and cardboard boxes of a size adjusted to the dimensions of the pallets). The features of transport packaging are as follows:

- they are stable and enable the accumulation of a large number of loads,
- they ensure optimal use of space in warehouses and means of transport,
- they have appropriate certificates and are made of durable materials,
- may have an impact on the perception of the brand (this especially applies to e-commerce logistics, where the transport packaging can build the company's image).

We have been dealing with the circulation of transport packaging (pooling), based on the long-term use of specially designed packaging for specific supply chains, and then their regular maintenance and regeneration so that they serve as long as possible without having a negative impact on the environment. This solution offers the following benefits (Rotom, 2021):

- the customer does not have to constantly invest in disposable packaging;
- standardization of packaging results in savings in return transport (thus reducing the negative impact on the natural environment in the form of CO₂ emissions), and enables cooperation with automatic systems (this reduces jams and improves product flow in the supply chain, with little or no system downtime).

Nowadays, the entities implementing/servicing online sales face the challenge of introducing returnable unit packages. From the perspective of finalizing returns of purchases made online and returning empty reusable packaging, there is a need to create packaging that will be used in e-commerce and will combine the features of unit and transport packaging (including durability, appropriate labeling, standardized dimensions, friendly for the environment and accepted by customers). Entities operating in the field of e-commerce must not only provide their products with the most secure packaging (and in the future also returnable), but also use ecological fillers for packages.

One solution to the analyzed problem is the SIOC method (ship in own container) (Packing, 2021), which consists in packing the goods by the producer immediately into a shipping box. This prevents the need to pack products in additional layers and reduces the amount of waste. However, if the customer orders several different products in the online store, they will have to be packed in one collective packaging and shipping packaging becomes a necessity. It must be durable (e.g. resistant to shocks, mechanical damage or changing weather conditions) and improve product packaging (e.g. have an automatic die-cut structure, or be equipped with an adhesive strip so that the use of the tape is not necessary) (Packing, 2021). Moreover, in e-commerce, packaging acts a special role due to the phenomenon of unboxing, i.e. the experience of unpacking – it is often not only a private experience, as consumers are eager to share it on their social media. Unpacking the ordered product (e.g. from the fashion industry) is often compared to receiving a gift. Thus, the selection of packaging significantly affects the brand's reputation and can be an incentive to buy (Opakowania.com.pl, 2021).

Summing up, it can be indicated that the creation of returnable packaging for online transactions in the B2C area becomes a challenge for economically and ecologically better logistics. The packaging that will perform the aforementioned functions, will be biodegradable, will be equipped with appropriate packaging auxiliaries – for closing and preparing for shipment, as well as meeting other customer expectations.

Research results

An online survey (CAWI) was carried out to verify the readiness of customers for a new market behavior related to the multiple use of unit transport packaging used for online purchases. The respondents independently answered the questions included in the spreadsheet. The questionnaire was made available in electronic form (access via an internet link) in the period from 4 May 2021 to 26 June 2021. The questionnaire was distributed nationally.

The survey was anonymous. The selection of the sample for the study was non-random; the snowball method was used. It is worth mentioning that due to the sampling method, the study is not representative, so the results cannot be generalized to the entire population of Poland. Therefore, all conclusions will be related to the studied sample, i.e. the respondents who took part in the survey – it was 1,213 respondents.⁵

The results of the study are presented in Tables. In the context of the respondents' attitudes towards

unit transport packaging that can be used for online shopping, the following research question was asked: "Does (and how) the age affect the assessment of the importance of the characteristics of the unit packaging?"

Taking into account the features of a standard unit transport packaging important for the respondents, it is difficult to indicate an unambiguous, narrowly defined set of features (see Table 1). Nevertheless, most of the respondents paid a lot of attention to such features as: protection against external factors, protection against unauthorized opening, protection against damage, packaging size adapted to the size of the product or packaging strength, i.e. product protection. The respondents pay a little attention to the color of the packaging, its appearance or the name of the manufacturer of the product on the packaging. The feature of the packaging "convenient to use" is worth noting, as 27.25% of respondents indicated that this property does not matter at all, 35.45% said that it is of little importance, and 25.70% indicated that it is of great importance.

In the context of the perception of the characteristics of unit packaging used to transport products purchased on-line, the respondents' answers were divided into two age groups, namely under and over 30 years old. On this basis, it should be pointed out that features such as the aesthetics or colors of the packaging, as well as the name of the manufacturer placed on the packaging, are more often noted by younger respondents. The differences according to the indicated age groups for the examined packaging features are not radical, mainly they rely on a slightly different degree of importance of a given feature for respondents of different ages.

Table 2 presents the share of respondents' answers in the context of potential features of the new unit returnable packaging as part of on-line shopping by two age groups. According to the respondents, the most important and important features are: information about not throwing the package, the material from which it was made is degradable, biodegradable or recyclable, possibility of reusing, protection against external factors, unauthorized opening and destruction, labeling of the shipment, packaging size adapted to the size of the product, the way the product is packaged, the type of closure (e.g. easy to open), and strength.

Features such as colors, the name of the manufacturer of the product on the packaging or appearance are of less or no importance at all. In the case of such features as: aesthetics and ease of use, the respondents were the least agreeable. For some of the respondents, these features were of great importance, for others they were of little or no importance at all.

Table 1

Features of unit packaging as part of on-line purchases and the share of the frequency of responses by age groups (in %)

Features	It doesn't matter at all		It is of little importance		It matters a lot		It is of great importance		I have no opinion	
	<30	>30	<30	>30	<30	>30	<30	>30	<30	>30
Aesthetics	20.6	31.4	39.4	42.0	31.1	20.3	8.0	4.5	0.8	1.8
Information about not throwing the parcel	6.1	7.1	21.7	21.9	48.2	47.3	23.1	22.3	1.0	1.4
Color	44.5	59.4	42.3	32.7	9.3	5.1	2.7	1.2	1.3	1.6
The material from which it was made is degradable, biodegradable or recyclable	13.7	15.8	27.0	25.4	38.0	35.9	18.7	20.1	2.5	2.8
Information that it is reusable	11.7	12.2	24.6	28.2	40.4	37.9	21.5	19.5	1.7	2.2
The name of the manufacturer of the product on the packaging	40.7	49.3	38.2	31.6	14.6	11.4	4.6	5.3	1.8	2.4
Protection against external factors	4.2	6.5	14.5	15.4	44.4	46.9	36.5	29.8	0.4	1.4
Protection against unauthorized opening	3.7	4.7	9.7	12.4	42.7	45.0	43.5	36.9	0.4	1.0
Protection against destruction	2.1	2.8	9.0	8.7	41.5	46.2	46.8	41.0	0.6	1.2
Marking the shipment	10.3	11.6	25.8	27.0	44.2	43.4	18.6	15.6	1.1	2.4
The size of the package is adapted to the size of the product	4.1	4.7	14.8	15.8	43.7	44.4	36.8	33.7	0.7	1.4
The way the product is packaged	5.2	6.3	14.6	19.1	45.8	44.6	33.0	28.4	1.4	1.6
Closure type (e.g. ease of opening the package)	10.8	11.0	23.9	23.1	39.4	41.8	24.5	21.9	1.3	2.2
Appearance	33.8	40.8	36.8	36.7	21.1	16.2	6.9	4.7	1.4	1.6
Comfortable to use (e.g. a handle)	27.3	27.2	34.8	36.1	25.6	25.8	9.7	8.9	2.5	2.0
Resilience	3.2	4.9	12.5	16.8	45.4	46.2	37.6	30.4	1.3	1.6

Source: own study.

The changes in expectations to the features of the new returnable packaging compared to the current packaging are not radical. However, the respondents noticed some features that should be more visible in the new returnable packaging. The features that, according to the respondents, should be even more important in the case of a potential returnable packaging are: the packaging material should be degradable, biodegradable or recyclable, the packaging should be reused (this feature is consistent with the definition of returnable packaging, although it is important that the respondents paid attention to it), and the size of the packaging should be adapted to the size of the

product. Interestingly, according to the respondents, the importance of the "comfortable to use" feature for a new packaging should be less important than for the currently functioning packaging.

The respondents indicated additional features that, according to them, the new returnable packaging should have, such as: the possibility of folding and unfolding, stiffness, tightness, lightness, no sharp edges or the fact that the packaging should contain instructions regarding the packaging and its use. It should be noted that according to the assumption younger respondents pay more attention to visual features of unit packaging, while older – to practical features.

Table 2

Potential features of unit returnable packaging as part of on-line purchases and the share of the frequency of responses by age groups (in %)

Features	It doesn't matter at all		It is of little importance		It matters a lot		It is of great importance		I have no opinion	
	<30	>30	<30	>30	<30	>30	<30	>30	<30	>30
Aesthetics	21.4	26.0	40.0	43.0	29.7	22.5	6.9	5.7	2.0	0.8
Information about not throwing the parcel	7.5	6.9	19.9	20.1	46.3	44.6	24.6	24.3	1.7	1.0
Color	29.7	38.9	47.7	46.7	16.3	8.3	4.1	3.2	2.1	1.3
The material from which it was made is degradable, biodegradable or recyclable	5.1	7.9	15.5	19.7	40.0	40.4	36.9	28.6	2.5	2.5
Information that it is reusable	3.4	3.2	7.3	8.7	33.9	36.3	53.2	49.1	2.1	1.7
The name of the manufacturer of the product on the packaging	30.8	35.3	38.9	38.7	21.5	15.0	6.9	7.1	1.8	1.8
Protection against external factors	2.7	2.6	6.3	8.3	38.3	39.4	50.8	46.5	1.8	0.4
Protection against unauthorized opening	3.1	3.2	7.0	6.9	37.0	37.9	50.8	48.5	2.0	0.4
Protection against destruction	2.5	3.0	6.3	4.7	36.5	36.3	52.7	52.7	2.0	0.6
Marking the shipment	11.5	12.0	25.5	23.9	39.0	41.4	21.8	18.7	2.1	1.1
The size of the package is adapted to the size of the product	5.1	4.5	13.2	11.2	40.8	42.4	37.9	38.1	3.0	0.7
The way the product is packaged	6.2	7.3	14.9	14.8	43.0	45.8	33.2	28.4	2.7	1.4
Closure type (e.g. ease of opening the package)	7.3	7.3	18.7	14.8	42.3	43.4	29.4	30.6	2.3	1.3
Appearance	25.4	28.6	40.4	42.2	24.4	19.1	7.3	6.3	2.5	1.4
Comfortable to use (e.g. a handle)	18.9	16.4	30.1	29.8	33.7	33.7	14.6	16.2	2.7	2.5
Resilience	2.0	2.4	4.5	7.9	36.6	36.9	54.8	49.5	2.1	1.3

Source: own study.

Conclusive remarks

In the face of climate change, shrinking natural resources, the growing scale of e-commerce sales, and other determinants, society is increasingly paying attention to the problem of the growing number of packaging, turning more towards packaging that can be recycled and reused. Thus, companies are increasingly interested in reusable packaging and ecological supply chain management (with zero waste strategies).

The study shows that it is important for customers who buy online that the unit transport packages fulfill the basic protective functions. The respondents indicated that returnable packaging

should have similar features as the packaging currently used in online shopping. The differences in the characteristics of packaging according to the age groups of the surveyed respondents are not radical. They mainly rely on a slightly different degree of importance of a given feature for respondents of different ages. Slight differences in the importance of individual unit packaging features for the users of future returnable packaging may be a guideline for people designing returnable packaging for e-commerce. It seems that more attention should be focused on determining the method of return that is convenient for customers.

In summary, redesigning supply chains (to improve reverse logistics), investing in new returnable packaging for online distribution of products, and creating customer-friendly and cost-effective return processes can deliver the following benefits:

- less waste,
- reduction of the carbon footprint,
- promoting a circular economy,
- cost optimization.

Reusable transport packaging (e.g. reusable plastic containers, pallets or box-pallets) designed to work in closed-loop B2B relationships is already used over and over again for their entire lifetime before being reprocessed and transformed into other packaging products. The reduction of waste caused by the use of disposable packaging is one of the main environmental factors to consider when choosing a returnable packaging system.

Notes/Przypisy

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² It refers to the possibility of recirculation of obtained items (recycling) and/or subjecting the residual goods to neutralization (utilization).

³ Focused on the impact of the remains of a given product and its packaging on environmental pollution.

⁴ The logistic function consists of: a) protective function – the packaging protects the cargo against loss or reduction of its value and quality on the way from the producer to the consumer; should protect the goods against mechanical damage and climatic loads (humidity, temperature) and protect them against theft of the goods inside; b) warehouse function – the packaging is used to protect the goods during storage, it should help in the storage of goods (i.e. it should be suitable for stacking on top of each other or on a pallet, so as to make the most of the storage space); c) transport function – the packaging should be suitable for carrying and transport (the important things here are: the weight of the packaging, shape and dimensions, which should be such that they take up as little space as possible during transport); d) manipulation function – should facilitate loading (facilitate stacking, translating, storing and forming goods both at the stage of production, storage and transport) and should be adapted to the standardized dimensional system (standardization of dimensions is necessary to speed up and improve transport and to facilitate the keeping of goods in a warehouse); e) information function – packaging is an information carrier, it should contain certain elements allowing its identification; this is especially important if the goods are, for example, dangerous to the environment, then they should be marked in such a way as to warn against being lifted or opened by accidental persons. The packaging should contain all the information necessary for the safe transport of the goods (e.g. a clear delivery address and, if necessary, information on what type of goods is transported, a bar code or the so-called color code – it enables product identification without opening the package).

⁵ Among the respondents, 62% were women, 37% – men, and 1% of the respondents did not specify their gender. People aged 17 to 79 participated in the study. The greatest number, as many as 600 (which accounted for nearly 50% of the total), are people aged 21–30. Moreover, about 9% of respondents under the age of 20, 24% – aged 31–40, 11% – aged 41–50, 3% – aged 51–60 and 2% – aged over 60 years old. Another factor differentiating the respondents is the place of residence – 76% of the respondents are city dwellers, and 24% of the respondents stated that their place of residence was rural.

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Jarosław Woźniczka

CIEMNA STRONA MARKETINGU

Posługując się prostą metaforą, można stwierdzić, że zarówno w podręcznikach, jak i w praktyce rynkowej prezentowana jest zwykle jasna strona marketingu. Przejawia się ona m.in. w nastawieniu przedsiębiorstw na zaspokajanie potrzeb nabywców, dostarczaniu im użytecznych produktów, oferowaniu ich na korzystnych warunkach i zapewnianiu odpowiedniego poziomu obsługi. Marketing ma jednak także swoją ciemną stronę. Za pomocą tego określenia opisuje się wszystkie te działania rynkowe, które można uznać za nieetyczne, nielegalne, nieuczciwe, oszukańcze czy manipulacyjne, a których efektem jest powstawanie różnego rodzaju szkód dla nabywców, konkurentów i konkurencji, środowiska naturalnego lub innych grup interesariuszy. Prezentowana monografia jest poświęcona eksploracji ciemnej strony marketingu. Zawiera swoisty katalog nieetycznych lub co najmniej kontrowersyjnych praktyk rynkowych, takich jak m.in. ukrywanie wyników badań marketingowych, fałszowanie ich i dezinformowanie nabywców oraz opinii publicznej, oferowanie nabywcom szkodliwych lub wadliwych produktów,

żądanie od nich nieuczciwych cen za określone dobra lub usługi, wchodzenie w zмовы cenowe, stosowanie korupcji w działaniach sprzedażowych, dyskryminowanie nabywców poprzez oferowanie im gorszych warunków zakupu niż innym klientom, oszukiwanie ich za pomocą komunikacji marketingowej czy manipulowanie nimi przez sprzedawców, telemarketerów i pracowników obsługi klienta. Poszczególne przejawy ciemnej strony marketingu zostały zidentyfikowane i objaśnione, przedstawiono mechanizmy i możliwe skutki tego typu działań, reakcje nabywców wobec nich oraz stosowane sposoby przeciwdziałania im.

Więcej informacji na stronie www.pwe.com.pl