IDENTIFICATION OF CUSTOMERS' PURCHASING BEHAVIOUR PROFILES IN THE CONTEXT OF CORPORATE SOCIAL RESPONSIBILITY

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Purpose: The aim of the article is to identify customers' purchasing behaviour profiles on the basis of characterizing the process of making a decision to purchase a product from food industry companies' indicators (observable variables) in the context of corporate social responsibility (CSR).

Design/methodology/approach: The data for the research were collected from a survey concerning a group of 801 customers from the Świętokrzyskie Voivodeship. The resources were pre-explored and pre-processed to enable further studies. In order to obtain customers profiles, the latent class analysis (LCA) method was used. It enables identification of homogeneous groups (latent classes) of customers based on selected indicators.

Findings: The impact on customers' purchasing behaviour of 15 CSR activities undertaken by enterprises from several different groups (in relation to: environment, society, employees, contractors, and customers) was examined. Six profiles of customer purchasing behaviour were identified. They were labelled and subjected to descriptive characteristics.

Research limitations/implications: The results point out the need to continue the research based on a broader countrywide data set.

Practical implications: The research findings can contribute to improving the effectiveness of food industry companies in the range of CSR activities. Due to this, these companies will be able to take more effective steps to retain existing customers and acquire new ones.

Social implications: Taking corporate social responsibility actions contributes to solve social and environmental problems. It can also affect the quality of life in a society. Nowadays, it is an important and developmental research area.

Originality/value: The conducted study showed that latent class analysis is proper tool for analysing the qualitative data obtained in the questionnaire surveys. The work provides a vital information on the impact of corporate social responsibility activities by food industry companies on customers' purchasing behaviour.

Keywords: corporate social responsibility, customer profiles, purchasing behaviour, food industry, latent class analysis.

Category of the paper: Research paper.

1. Introduction

Corporate Social Responsibility (CSR) is a complex and interdisciplinary term (Sheehy, 2015) with a multidimensional nature (Lorena, 2018). It combines economic, social, philosophical, ethical issues and refers to developments in other fields of science. CSR encompasses the economic, legal, ethical (Sheehy, 2015) and discretionary/philanthropic expectations that society places on businesses at any given time. Furthermore, it includes the active, voluntary dedication of company resources to implement activities aimed at enhancing the quality of life in society, improving the quality of the environment, and solving social problems (Kang, Liu, 2014).

At the core of the CSR concept is the stakeholder theory, which defines persons or groups of persons to whom enterprises can be socially responsible, that is, whose interests they are to take into account in their activities. Stakeholders are individuals, groups or organizations that affect or are affected by the results of actions of leaders, managers, and employees of the company (Bryson, 2004).

The essence of CSR is the conviction that no economic entity is self-sufficient, and that companies – especially large ones – are centres of power and decision-making, and that their activities influence many aspects of citizens' lives (Bowen, 1953). This means that in order to function, it needs contacts with suppliers, customers, or entities responsible for distributing the products it offers. Enterprises are elements of a broader system. In response to the growing expectations of the wider environment (Kowalczyk, Kucharska, 2020; Ahmad et al., 2021), enterprises include more and more objectives in their strategies, plans to implement activities that are part of the social responsibility concept. The entity assuming social responsibility bases its activities on decisions that favour the improvement of conditions in which it and other entities function (Sen et al., 2016).

There are no regulations and legal provisions that would enforce business entities to engage in socially responsible initiatives. The concept may be treated as going beyond the boundaries of law, carrying out tasks that aim at achieving something more than just the state in which the activities of enterprises lead to achieving their own goals (without taking into account the expectations of various interest groups). The concept of CSR is therefore about balancing the conflicting expectations put forward by different interest groups.

It is commonly believed that CSR can bring benefits to a firm, such as: increased sales (Moliner et al., 2020); increased profits (Kim, Ji, 2021); easier access to investors' funds (Cox, Wicks, 2011); improved credit rating position (Hsu, Chen, 2015); increased stakeholder confidence (Cuesta-Valiño et al., 2019); strengthening brand recognition and the brand's impact (Luo, Bhattacharya, 2006); reducing advertising expenditures (Li et al., 2015); improving reputation and image (Murè et al., 2020). CSR contributes to increasing the quality of employees' work (Lee et al., 2012), reducing the level of their turnover (Galbreath, 2010) and

promotes the implementation of innovations in enterprises, which thus strengthen their competitive position (Orlitzky et al., 2011). One of the assumptions of the CSR concept is to minimize the negative impact on the environment and rational management of resources, which results in cost reduction and savings (Halme et al., 2020).

An important benefit of engaging in socially responsible tasks by the enterprises is obtaining by these entities the so-called social consent to act (Vanhamme, Grobben, 2009), i.e. a mandate of trust (Keenan et al., 2019) and acceptance of the mode of action by stakeholders (An et al., 2019).

It is also important that the benefits are interconnected by a chain of dependencies, so it is most beneficial from the point of view of the competitive position of the enterprise to constantly engage in various social and environmental activities in strategic terms. It is necessary to integrate the various objectives of the enterprise with each other (Haigh et al., 2015) and not to treat socially responsible objectives as something additional.

The CSR concept should be identified not only with its benefits, but also with costs and risks (Kiliańska, Krechowicz, 2021). The implementation of socially responsible tasks involves the necessity to allocate a part of the profit generated by enterprises to finance activities aimed at satisfying the needs of stakeholders (Türker, 2009).

The research is focused on the activities of food companies, as the goods they offer satisfy basic needs of people, such as hunger or thirst, needs that no other products can fulfil. The food industry is the leader in implementing solutions related to safety and the impact of products on consumer health (Wei et al., 2018). The activities undertaken by the companies often go beyond the scope of the legal obligations as an expression of socially responsible initiatives. The CSR survey in relation to the food industry is also justified because this branch of economy is facing strong criticism from the public opinion due to its high dependence on natural resources (Hartmann, 2011).

The main aim of the article is to identify customers' purchasing behaviour profiles on the basis of indicators (observable variables) characterizing the process of making a decision to purchase a product from food industry companies in the context of CSR. In addition, it will be possible to investigate whether socially responsible initiatives undertaken in different CSR areas have an equal impact on these behaviours.

2. Customers – an important group of stakeholders

Customers are among the external stakeholders of businesses (Gürleka, Tuna, 2019). Their consumption needs are met according to their tastes, preferences, values, and habits that differentiate them (Carbonell et al., 2008). Tastes and preferences refer not only to the characteristics of food products such as taste, smell, texture, nutritional value, but also to the

packaging, the image of the manufacturer and its socially responsible activities. Customers may react differently to these characteristics (Combris et al., 2009).

Customers want companies to help solve their problems, make a real contribution to improving their quality of life, run their business with integrity, take great care to create safe products, treat employees with dignity and reduce environmental impact.

Between customers and businesses there is a two-way relationship: customers can affect the way businesses operate, shape, and determine the adoption of certain actions or inaction. At the same time, customers are influenced by the actions of the enterprise (Figure 1).
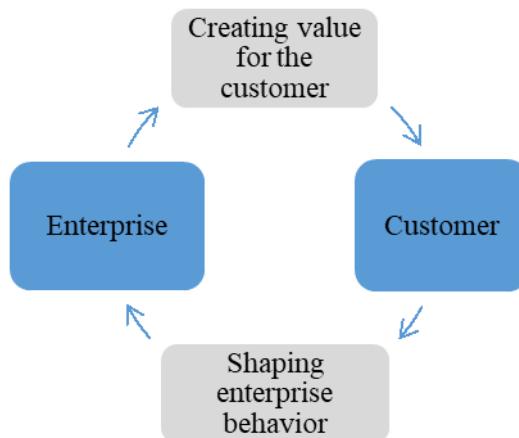

Figure 1. Relationships between stakeholders and an enterprise.

Source: authors' own elaboration.

Customers understand the interrelationships linking their buying behaviour to other economic processes, including the actions taken by the business sphere in CSR. Demand for particular products largely determines what businesses produce and what services they offer. Demand determines the direction that businesses should pursue in order to get customers to buy. Without customers, there is no market and no chance for the company to survive in the long term. All this means that customers should be seen as one of the key stakeholders.

Customers are at the centre of attention of socially responsible enterprises that try to adapt their activities and offered products to their needs in order to provide them with goods that are best suited to their purchase (Patnaik, Mortensen, 2009) – also in terms of socially responsible activities. Such behaviour can ensure that companies achieve their own sales targets.

The choice of products that customers buy is influenced not only by the features directly related to the product, such as price, quality, price-quality relation, or the degree of satisfaction of customer needs. Customers are not only interested in the product itself and its functionality and usability. Customers are looking for broader information about the product, including the origin of intermediate products, production methods and the possibility of indirect participation in the process of solving social problems. Factors such as the product's impact on the environment, the percentage of recycled resources used in the production of a given good or the manufacturer's commitment to donate part of the profit to solving a specific social problem are becoming important.

Enterprises take different actions – some may be socially responsible, others socially irresponsible (Janney, Gove, 2011). Customers can react to both of these by changing their purchasing behaviour. CSR is regarded to affect consumers' attitudes toward a brand and/or a company and further influence consumers' purchasing decisions (Ailawadi et al., 2014; Hartmann, 2011).

A portion of the customers become indirectly involved in socially responsible initiatives undertaken by enterprises by purchasing these goods, a part of the profit from sales of which will be transferred by business entities to finance pro-social and pro-environmental tasks. Customers buy these goods to provide themselves with emotional values – to feel that part of the profit made by the company offering them will be allocated to solving social problems. In addition to satisfying their needs that prompted them to make the purchase, customers also have a sense of participation in the process of implementation of social tasks by the company, they derive satisfaction (Islam et al., 2021) from the fact that they contributed to doing good and supported a pro-social initiative.

Behaviours that contribute to the deterioration of the widely understood quality of social life and have a negative impact on the environment naturally do not enjoy stakeholder approval (Paliwoda-Matiolińska, 2009). The entities that do not eliminate their negative influence on the environment do not receive social acceptance for their actions, which results in negative consequences for the companies (Islam et al., 2019; Wagner et al., 2020).

For example, customers express their dissatisfaction with the actions of companies by boycotting them (Lambin et al., 2020) or sharing negative opinions about specific products or companies with others (Shim, Kim, 2021). There are numerous examples in business practice of customers publicly expressing their dissatisfaction and declaring that they will stop buying products or groups of products in order to change the company's attitude in some aspect. Boycotting specific areas of business does not always result in a change in its attitude and behaviour (Yang, Rhee, 2019), but in many cases it succeeds. It is a kind of punishment for behaviour of the business entity that is unfair/inconsistent with consumer expectations (Scheidler, Edinger-Schons, 2020). Companies should take into account the opinion of customers because their disapproval in the long term may translate into poorer financial performance. Interestingly, research confirms that customers may also negate the lack of commitment to CSR or boycott irresponsible actions implemented by a business entity (Pipatprapa et al., 2017). Research shows that when faced with the risk of a consumer boycott, companies are more likely to undertake socially responsible initiatives (Karwowski, Raulinajtys-Grzybek, 2021).

3. Selected aspects of data mining techniques

Nowadays, data analysis is a term used in a very broad context, including various analytical techniques – both basic ones as well as data mining and artificial intelligence. In the classic context it is data processing using mathematical and statistical methods in order to extract valuable and useful information allowing for decision making. Discovering knowledge from data requires the use of data mining methods and advanced software. Data mining is the analysis of an observed data set in order to find non-obvious relationships and interdependencies that exist in them (Foreman, 2014; Larose, 2005; Hand et al., 2001).

One of the commonly used data mining methods is clustering which allows to divide a data set into homogeneous groups in order to extract some repetitive patterns (Vermunt, Magidson, 2002). It is a well-known data mining technique, commonly used for quantitative, qualitative, and mixed data (Ruiz-Chavez et al., 2018; Xiao et al., 2019). The choice of the cluster analysis method is to some extent a subjective decision of the researcher which depends on the specifics of the data, the purpose of the research, and the practical usefulness of the results; there is no clear formula to determine which clustering tool is the most appropriate for a particular data set (Nowakowska et al., 2020; Rodriguez et al., 2019). In this study, the data collected from the surveys are qualitative in nature. Therefore, the latent class analysis (LCA) method was chosen to identify customers' purchasing behaviour profiles.

LCA is one of the clustering methods that use the concept of latent variable (that cannot be directly measured or observed). Nevertheless, this latent variable manifests its intensity and presence through other qualitative variables (called observable variables or indicators), the values of which can be measured and observed. In contrast to other techniques, LCA uses the concept of classifying units into homogeneous, directly unmeasurable groups (clusters) based on estimated conditional probabilities which means that the indicator takes a certain value provided that the observation it characterizes belongs to a specified latent class (Frątczak, 2013; Collins, Lanza, 2010; Vermunt, Magidson, 2002). LCA allows modelling the relationships between categorical variables – so it is appropriate for the data set under consideration. In addition, there are no restrictions relating to the normality of data distribution, homogeneity of variance or requirements of linearity. There is an assumption: each observation belongs to exactly one latent class and there exists a local independence condition between the indicators. Hence, the conditional membership of a latent class is unequivocal.

The research concerns objects studied in the context of a specific issue. In this case, the unit is a customer making a decision to purchase a product from a food company. The final model is built on the basis of a sample of the population. The sample consists of data collected from the survey concerning a group of 801 customers from the Świętokrzyskie Voivodeship. In particular, the indicators X_j, $j = 1, …, J$, are defined by J observable variables describing customers' purchasing decisions. Using latent class analysis, it is possible to separate C latent

classes K_c ($c = 1, ..., C$) – homogeneous groups enabling identification of buyer profiles. Each of the indicators X_j has values in the collection of categories R_j; they create the contingency table which allows to define the model of LCA. In every latent class K_c, each observation z ($z \in Z$, where Z is a set of observations characterized by indicators X_j) and has some value for the j-th observable variable. Equation 1 presents the form of the LCA model that estimates the probability of occurrence in the observation z belonging to the vector $r(z)$ which represents the combination of the indicator's values $X_1, ..., X_J$, having a value equal to q (Nowakowska, Pajęcki, 2020, 2021; Frątczak 2013; Collins, Lanza, 2010). The publications cited earlier provide more theoretical information on the latent class analysis.

$$P(r(z) = q) = \sum_{c=1}^{C} \gamma_c \cdot \prod_{j=1}^{J} P(r_j(z) = q_j | z \in K_c) = \sum_{c=1}^{C} \gamma_c \cdot \prod_{j=1}^{J} \rho_{q_j|c} \tag{1}$$

where:

c – latent class number in the LCA model; $c = 1, …, C$,

C – the number of latent classes,

K_c – c-th latent class,

z – observation in the Z set; $z \in Z$; Z – the set of observations characterized by indicators X_j,

γ_c – the probability of the c-th latent class (i.e. the probability of an observation belonging to the K_c latent class); $\gamma_c = P(K_c) = P(z \in K_c)$; $\sum_{c=1}^{C} \gamma_c = 1$,

$\rho_{q_j|c}$ – the conditional probability that the j-th indicator will take the value q_j in the K_c latent class; $\rho_{q_j|c} = P(q_j|c) = P(r_j(z) = q_j | z \in K_c)$,

q_j – the value of the j-th indicator; $q_j \in R_j$; R_j – the set of categories of the j-th indicator, $j = 1, ..., J$.

In the LCA method, as in other cluster analysis methods, it is important to determine the final set of indicators and identify the most optimal number of latent classes. Generally, a universal and unambiguous way to determine the most appropriate number of clusters is not known (Weller et al., 2020; Masyn, 2013) and this issue is an important area of current research (Dziak et al., 2020, Nylund-Gibson, Choi, 2018). The quality of the estimated LCA model is assessed using measures derived from the G^2 statistic (Frątczak, 2013; Collins and Lanza, 2010). In order to select the most fitting model, the following aspects were considered: practical and theoretical sense of the separated latent classes; relatively small values of information criteria (*BIC – Bayesian information criterion, CAIC – consistent Akaike information criterion and ABIC – adjusted Bayesian information criterion*) (Lanza et al., 2015; Frątczak, 2013; Collins, Lanza, 2010); the value of entropy statistic (Collins, Lanza, 2010) – if the value is higher, the separation of latent classes is better; the values of index of the discriminating ability *AR* (Nowakowska, Pajęcki, 2021) which determines the role of individual indicators in the distinguishability of latent classes; not too large number of the classes to simplify the model (Frątczak, 2013) and insight into the estimated parameters of models located close to each other.

4. Data set for the research

The study was carried out using survey research. During the planning of the research process, the area of data collection was established. This article presents the results of a pilot study – the scope was limited to one of the sixteen voivodeships in Poland: Świętokrzyskie Voivodeship. This region is characterised by characterised by favourable conditions for the development of agri-food production and thus the food industry. What is important, the agri-food sector is one of the strategic sectors for the Świętokrzyskie Voivodeship (Godlewska-Majkowska et al., 2012). In addition, modern agriculture and food processing were distinguished among the four smart specializations for the region, including production of food and beverages (Noworól et al., 2019).

Based on the data provided by the Central Statistical Office, the structure of the general population in the Świętokrzyskie Voivodeship was determined. The respondents to the test sample were selected on the basis of the targeted selection of units. The survey was addressed to adult residents of the Świętokrzyskie Voivodeship who are consumers of food products. The choice was motivated by the fact that every adult can purchase foodstuffs regardless of their nature (e.g. alcoholic, non-alcoholic products or tobacco products). The control variables were age and sex, but the research also included a question about their education.

Initially, the essential study was conducted from December 2019 to February 2020, with data collection using the Paper and Pencil Interview (PAPI) technique. Due to the epidemic situation in Poland, the authors were forced to suspend data collection through direct contact with respondents. From November 2020 to March 2021, BioStat Research and Development Center continued the survey and provided data from respondents who were reached using Computer Assisted Web Interviews (CAWI) and Computer Assisted Telephone Interviewing (CATI) techniques. Data collected using three techniques for reaching respondents (PAPI, CATI, CAWI) were combined into a single database. The data collected therein ensured that the survey sample was representative in terms of gender and age of the residents of the Świętokrzyskie Voivodeship.

The data obtained from the respondents were initially assessed in terms of completeness (formal control) and accuracy of filling (substantive control). These resources were pre-explored that enable further studies. The data cleaning process has been performed. 1960 people accepted the invitation to participate in the study. Finally, 801 fully completed questionnaires were qualified for data analysis. The structure by age and sex of the general population and the research sample was presented in the Table 1. Figure 2 additionally shows the education structure of the study sample.

Table 1.
Structure of Świętokrzyskie Voivodeship and research population

Sex	Age	Świętokrzyskie Voivodeship [%]	Research sample [%]
Female	18-24	4.73	4.87
Male		4.54	5.12
Female	25-34	8.92	8.74
Male		8.29	7.99
Female	35-44	9.54	9.11
Male		8.92	8.61
Female	45-54	7.53	7.74
Male		7.40	7.49
Female	55-64	8.41	8.61
Male		8.88	8.86
Female	65 and older	9.12	9.11
Male		13.71	13.73

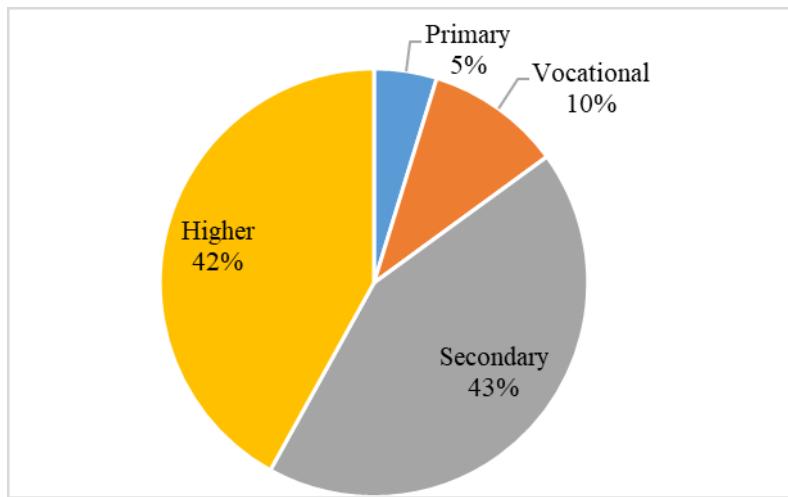Source: authors' own elaboration.

Figure 2. Educational structure of the research population.

Source: authors' own elaboration.

Apart from the questions about age, sex, and education, the survey asked respondents to rate how often they pay attention to the fact that food industry companies implement CSR activities before deciding to buy a product from these companies. The activities come from several different groups (in relation to: the environment, society, employees, contractors, and customers); characteristics of the relevant research data are shown in Table 2. The answer to each of the following survey questions could be rated from 1 (never) to 5 (always). Moreover, the distributions for each indicator are presented.

Table 2.
Characteristics of the relevant research data

Group of CSR activities	Indicators, their descriptions, and values			
	Indicator name	The impact of the activities implemented by the enterprise on the purchasing behaviour of the respondents	Value	[%]
Contractors	CO_1	Having and following written standards of conduct in relations with contractors	1	13.86
			2	21.97
			3	38.08
			4	20.85
			5	5.24
	CO_2	Starting cooperation with contractors taking pro-environmental or pro-social activities	1	13.48
			2	25.72
			3	38.08
			4	18.48
			5	4.24
	CO_3	Starting cooperation only with contractors that respect the principles of environmental protection	1	8.99
			2	18.35
			3	36.95
			4	28.34
			5	7.37
Customers	CU_1	Introducing facilities for customers (e.g. mobile applications, facilities for the elderly or simplification of contracts)	1	4.12
			2	12.73
			3	31.71
			4	35.96
			5	15.48
	CU_2	Taking into account the suggestions of customers regarding the way the enterprise operates	1	9.49
			2	21.60
			3	39.33
			4	23.85
			5	5.74
	CU_3	Taking care of the health and life of customers	1	1.87
			2	7.74
			3	26.34
			4	38.20
			5	25.84
Employees	EM_1	Recruiting employees from the local labour market	1	11.11
			2	22.60
			3	36.20
			4	24.09
			5	5.99
	EM_2	Supporting the active participation of employees in the management of the enterprise	1	12.98
			2	21.85
			3	38.33
			4	20.35
			5	6.49
	EM_3	Provision of additional benefits for employees (apart from those required by law)	1	12.23
			2	18.73
			3	37.58
			4	21.85
			5	9.61

Cont. table 2.

Environment	*EN_1*	Doing more than the law requires for the environment	1	5.49
			2	17.23
			3	46.19
			4	24.34
			5	6.74
	EN_2	Taking actions to reduce the consumption of resources and energy	1	4.74
			2	16.48
			3	43.07
			4	29.46
			5	6.24
	EN_3	The use of eco-certified raw materials in the production process, even if they are more expensive than non-certified raw materials	1	6.37
			2	20.60
			3	39.70
			4	26.22
			5	7.12
Society	*SO_1*	Counteracting social problems	1	7.12
			2	19.35
			3	40.20
			4	23.72
			5	9.61
	SO_2	Free of charge performance of works/services for the benefit of the local community	1	11.74
			2	19.60
			3	39.20
			4	21.72
			5	7.74
	SO_3	Material support for people in need and charities	1	6.37
			2	18.10
			3	40.70
			4	28.84
			5	5.99

Source: authors' own elaboration.

5. LCA model for customers' purchasing behaviour

Because the decision on the number of latent classes C is one of the crucial factors, a series of experiments were carried out for the considered data set in order to obtain the most accurate model. The number of these classes ranging from 2 to 10 was taken into account. As numerical methods were used, at any time 15 model estimates were made for each C-class variant with different initial values for the iterative process. Each time, in the obtained fifteen-element set of C-class LCA models, the representative one with the best fit statistic was selected for further analysis. At the beginning, two collections of LCA models were built:

a) *LCA*-15*V*, covering only 15 variables (indicators) describing CSR activities undertaken by enterprises from several different groups (in relation to: environment, society, employees, contractors, and customers),

b) *LCA*-18*V*, comprising 18 variables, including additional questions on age, sex, and education.

For both collections of the LCA models, the values of the *AR* indexes for each indicator, linked to a certain number of latent classes *C*, were calculated as shown in Figure 3 (for *LCA*-15*V*) and Figure 4 (for *LCA*-18*V*).
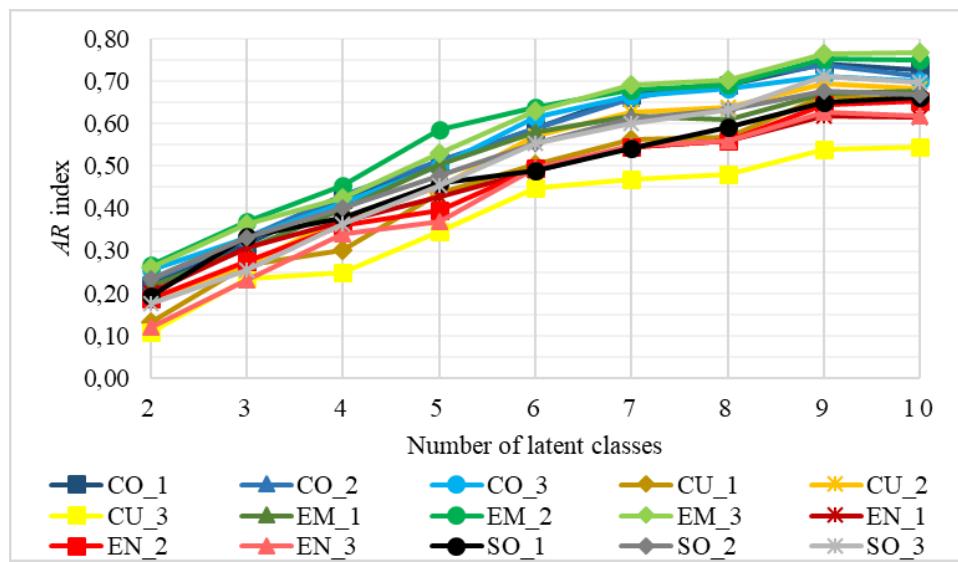

Figure 3. *AR* measures of indicators by the number of latent classes in the *LCA*-15*V* collection of the LCA models.
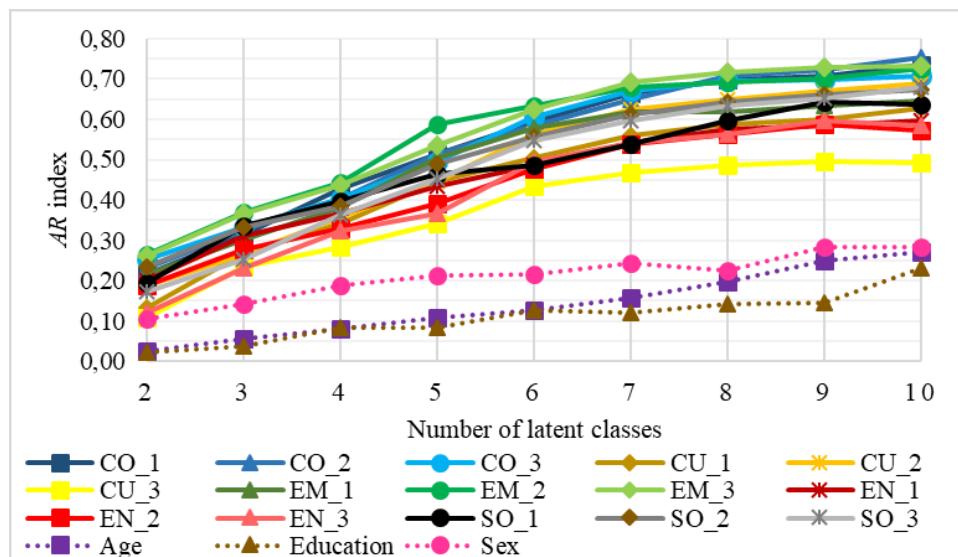
Source: authors' own elaboration.

Figure 4. *AR* measures of indicators by the number of latent classes in the *LCA*-18*V* collection of the LCA models.

Source: authors' own elaboration.

In the case of the *LCA*-18*V* models group, the values of the *AR* measures for the variables gender, age and education were always lower than 0.3. Considering that too many indicators generate a very large number of potential response patterns (sparse contingency matrix), which may cause difficulties in model construction (Lanza et al., 2013), the *LCA*-15*V* models group was chosen for further analysis. Finally, the variables: age, sex and education were not included in the final calculations.

For the *LCA*-15*V* collection of LCA models, the values of G^2, *BIC*, *CAIC*, *ABIC* and *Entropy* measures were calculated for each representative *C*-class model with a particular number of latent classes varied from 2 to 10 (later referred to as the *C*-class model), as shown in Table 3. In selecting the optimum number of latent classes, the most commonly used criterion is the *BIC* measure (Killian et al., 2019; Petersen et al., 2019). In this case, it has the lowest value for the LCA model with 6 latent classes (as well as the *CAIC* measure). The good evaluation of the 6-class model is also confirmed by obtained results of the other diagnostic statistics. Moreover, the value of the *AR* index (which is assessed by discriminating ability) for each indicator is not less than 0.45. Consequently, as the best one, the 6-class model was chosen to identify customers' purchasing behaviour profiles.
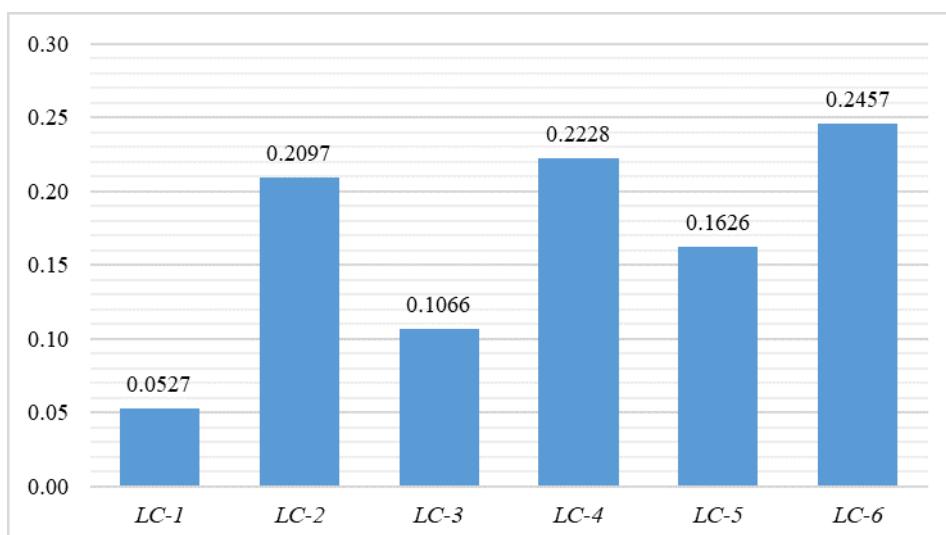
Table 3.
Values of selected measures for diagnosing LCA models by number of latent classes

Number of latent classes	G^2	*BIC*	*CAIC*	*ABIC*	*Entropy*
2	21089.93	21898.92	22019.92	21514.68	0.92
3	19445.05	20661.88	20843.88	20083.92	0.91
4	18706.59	20331.25	20574.25	19559.59	0.91
5	18005.47	20037.97	20341.97	19072.60	0.93
6	17476.72	19917.06	20282.06	18757.98	0.93
7	17153.44	20001.62	20427.62	18648.83	0.92
8	16916.76	20172.77	20659.77	18626.27	0.92
9	16684.73	20348.58	20896.58	18608.38	0.93
10	16513.95	20585.64	21194.64	18651.72	0.94

Source: authors' own elaboration.

Figure 5 presents latent class probability for the selected 6-class model – classes support is satisfactory. Figure 6 shows the obtained latent classes (in the form of the heat map) – the conditional probabilities that the indicator takes a given value provided that the observation characterised by it belongs to a certain latent class *c*. The names of these classes were labelled as *LC*-1, ..., *LC*-6.

Figure 5. Latent class probability for the selected 6-class LCA model.

Source: authors' own elaboration.

Indicator	Value	Latent class					
		LC-1	LC-2	LC-3	LC-4	LC-5	LC-6
CO_1	1	0.001	0.000	0.721	0.078	0.000	0.180
	2	0.001	0.046	0.145	0.454	0.068	0.335
	3	0.144	0.350	0.101	0.338	0.814	0.331
	4	0.363	0.599	0.034	0.119	0.117	0.060
	5	0.491	0.004	0.000	0.011	0.000	0.095
CO_2	1	0.048	0.012	0.684	0.099	0.000	0.142
	2	0.022	0.035	0.213	0.507	0.041	0.433
	3	0.126	0.404	0.079	0.262	0.904	0.307
	4	0.355	0.519	0.013	0.115	0.055	0.087
	5	0.450	0.029	0.011	0.016	0.000	0.031
CO_3	1	0.000	0.000	0.493	0.084	0.000	0.075
	2	0.023	0.041	0.293	0.552	0.000	0.079
	3	0.029	0.272	0.165	0.232	0.880	0.401
	4	0.361	0.640	0.048	0.132	0.119	0.311
	5	0.587	0.046	0.000	0.000	0.000	0.134
CU_1	1	0.000	0.000	0.222	0.049	0.000	0.026
	2	0.024	0.038	0.192	0.354	0.067	0.032
	3	0.028	0.257	0.336	0.271	0.797	0.146
	4	0.237	0.629	0.225	0.326	0.136	0.394
	5	0.711	0.076	0.024	0.000	0.000	0.401
CU_2	1	0.000	0.006	0.477	0.064	0.008	0.111
	2	0.001	0.040	0.265	0.434	0.080	0.284
	3	0.115	0.281	0.210	0.315	0.869	0.384
	4	0.271	0.627	0.048	0.187	0.043	0.158
	5	0.613	0.045	0.000	0.000	0.000	0.063
CU_3	1	0.000	0.000	0.137	0.007	0.000	0.010
	2	0.000	0.023	0.162	0.195	0.017	0.037
	3	0.051	0.126	0.235	0.364	0.670	0.078
	4	0.098	0.589	0.298	0.369	0.269	0.390
	5	0.850	0.262	0.168	0.065	0.044	0.484
EM_1	1	0.024	0.007	0.649	0.084	0.000	0.083
	2	0.025	0.047	0.231	0.482	0.041	0.310
	3	0.137	0.268	0.096	0.297	0.840	0.348
	4	0.339	0.598	0.024	0.136	0.119	0.185
	5	0.476	0.080	0.000	0.000	0.000	0.073
EM_2	1	0.001	0.000	0.816	0.101	0.000	0.083
	2	0.001	0.055	0.121	0.560	0.029	0.263
	3	0.065	0.383	0.050	0.310	0.921	0.307
	4	0.500	0.531	0.012	0.022	0.050	0.210
	5	0.434	0.030	0.000	0.008	0.000	0.138
EM_3	1	0.000	0.000	0.662	0.089	0.000	0.130
	2	0.024	0.056	0.206	0.505	0.056	0.125
	3	0.120	0.360	0.132	0.321	0.866	0.275
	4	0.132	0.541	0.001	0.074	0.077	0.281
	5	0.724	0.043	0.000	0.010	0.000	0.190

Indicator	Value	Latent class					
		LC-1	LC-2	LC-3	LC-4	LC-5	LC-6
EN_1	1	0.000	0.000	0.454	0.010	0.008	0.012
	2	0.048	0.027	0.321	0.368	0.079	0.143
	3	0.066	0.439	0.169	0.546	0.853	0.359
	4	0.463	0.503	0.056	0.076	0.061	0.329
	5	0.423	0.031	0.000	0.000	0.000	0.157
EN_2	1	0.000	0.000	0.362	0.000	0.008	0.031
	2	0.001	0.022	0.383	0.345	0.064	0.130
	3	0.107	0.334	0.207	0.499	0.770	0.394
	4	0.344	0.572	0.048	0.156	0.158	0.371
	5	0.548	0.072	0.000	0.000	0.000	0.075
EN_3	1	0.000	0.011	0.289	0.012	0.000	0.113
	2	0.095	0.020	0.331	0.327	0.041	0.333
	3	0.062	0.271	0.280	0.420	0.808	0.335
	4	0.236	0.604	0.088	0.241	0.150	0.145
	5	0.607	0.093	0.012	0.000	0.000	0.074
SO_1	1	0.000	0.009	0.458	0.038	0.000	0.048
	2	0.051	0.060	0.319	0.421	0.100	0.139
	3	0.188	0.382	0.223	0.485	0.827	0.186
	4	0.286	0.505	0.000	0.055	0.073	0.375
	5	0.475	0.043	0.000	0.000	0.000	0.252
SO_2	1	0.000	0.000	0.670	0.131	0.008	0.062
	2	0.001	0.076	0.240	0.481	0.141	0.099
	3	0.210	0.477	0.080	0.333	0.778	0.292
	4	0.256	0.394	0.009	0.054	0.073	0.392
	5	0.533	0.053	0.000	0.000	0.000	0.155
SO_3	1	0.000	0.000	0.473	0.015	0.000	0.040
	2	0.001	0.024	0.245	0.420	0.031	0.209
	3	0.185	0.242	0.203	0.407	0.853	0.389
	4	0.218	0.687	0.079	0.151	0.117	0.292
	5	0.595	0.047	0.000	0.006	0.000	0.070

Figure 6. The conditional probabilities of indicators for the selected 6-class LCA model.

Source: authors' own elaboration.

6. Customers' purchasing behaviour profiles

The profiles (patterns) of customers' purchasing behaviour were labelled and characterized on the basis of the obtained conditional probabilities of indicators for the selected 6-class LCA model. They are discussed in the subsections below.

6.1. Latent Class 1 (*LC*-1) – Customers almost always taking into account CSR activities of companies in their purchasing behaviour

The first latent class includes 5.27% of all the observations of the analysed data set. These customers are very attentive to the activities taken by food companies in the area of the CSR concept. In the process of making a purchase decision, customers almost always take into account whether the enterprise from which they intend to buy a product undertakes socially responsible activities; in each question there is a predominance of response values 4 and 5. The initiatives that most strongly influence the customers' purchasing behaviour include all activities in the customers area, one activity in the employees area and one in the environment area: *Taking care of the health and life of customers*: $P(CU\_3 = 5 \mid LC\text{-}1) = 0.85$; *Provision of additional benefits for employees (apart from those required by law)*: $P(EM\_3 = 5 \mid LC\text{-}1) = 0.72$; *Introducing facilities for customers (e.g. mobile applications, facilities for the elderly or simplification of contracts)*: $P(CU\_1 = 5 \mid LC\text{-}1) = 0.71$; *Taking into account the suggestions of customers regarding the way the enterprise operates*: $P(CU\_2 = 5 \mid LC\text{-}1) = 0.61$; *The use of eco-certified raw materials in the production process, even if they are more expensive than non-certified raw materials*: $P(EN\_3 = 5 \mid LC\text{-}1) = 0.61$.

6.2. Latent Class 2 (*LC*-2) – Customers often taking into account CSR activities of companies in their purchasing behaviour

Out of all the observations, 20.97% belong to the second latent class. It includes customers who often include in their purchasing behaviour the fact that the companies from which they buy products implement socially responsible initiatives. Except for indicator *SO_2*, the conditional probabilities of a response value equal to 4 are greater than 0.50. Moreover, in the *LC*-2 class, the conditional probability of the variable taking the value of 3 indicating an ambivalent effect of CSR activities on customers' purchasing behaviour is also relatively high.

The study has shown that one CSR activity has the definitely strongest impact on the decision to buy a product from a company: *Taking care of the health and life of customers*: $P(CU\_3 = 4 \text{ OR } CU\_3 = 5 \mid LC\text{-}2) = 0.59 + 0.26 = 0.85$. In addition to that, the customers in the *LC*-2 class often make their purchasing decisions specifically on whether enterprises take the following actions: *Material support for people in need and charities*: $P(SO\_3 = 4 \mid LC\text{-}2) = 0.69$; *Starting cooperation only with contractors that respect the principles of environmental*

protection: P(*CO_3* = 4 | *LC*-2) = 0.64; *Introducing facilities for customers (e.g. mobile applications, facilities for the elderly or simplification of contracts)*: P(*CU_1* = 4 | *LC*-2) = 0.63; *The use of eco-certified raw materials in the production process, even if they are more expensive than non-certified raw materials*: P(*EN_3* = 4 | *LC*-2) = 0.60.

6.3. Latent Class 3 (*LC*-3) – Customers not taking into account most CSR activities of companies in their purchasing behaviour

The third latent class includes 10.66% of all the observations. The customers generally do not take into account CSR activities when making a purchasing decision. It looks like their purchasing behaviour is shaped by factors other than the CSR actions of food companies.

The following activities have the weakest impact on purchasing decisions: *Supporting the active participation of employees in the management of the enterprise*: P(*EM_2* = 1 | *LC*-3) = 0.82; *Having and following written standards of conduct in relations with contractors*: P(*CO_1* = 1 | *LC*-3) = 0.72; *Starting cooperation with contractors taking pro-environmental or pro-social activities:* P(*CO_2* = 1 | *LC*-3) = 0.68; *Free of charge performance of works/services for the benefit of the local community*: P(*SO_2* = 1 | *LC*-3) = 0.67; *Provision of additional benefits for employees (apart from those required by law)*: P(*EM_3* = 1 | *LC*-3) = 0.66; *Recruiting employees from the local labour market*: P(*EM_1* = 1 | *LC*-3) = 0.65.

Nevertheless, these customers pay little attention to the two activities in the area of customers: *Introducing facilities for customers (e.g. mobile applications, facilities for the elderly or simplification of contracts)*: P(*CU_1* = 1 | *LC*-3) = 0.22 and *Taking care of the health and life of customers*: P(*CU_3* = 1 | *LC*-3) = 0.14.

6.4. Latent Class 4 (*LC*-4) – Customers rarely taking into account CSR activities of companies in their purchasing behaviour

The fourth latent class contains 22.28% of the observations. These customers rarely take into account CSR activities of food companies in their purchasing behaviour (the value of some indicator equals 2) and have an ambivalent attitude (the value of some indicator equal 3). Generally, the activities in the areas of employees and contractors have the smallest impact on customers' purchasing behaviour, e.g.: *Supporting the active participation of employees in the management of the enterprise*: P(*EM_2* = 1 OR *EM_2* = 2 | *LC*-4) = 0.10 + 0.56 = 0.66; *Starting cooperation only with contractors that respect the principles of environmental protection*: P(*CO_3* = 1 OR *CO_3* = 2 | *LC*-4) = 0.08 + 0.55 = 0.63; *Starting cooperation with contractors taking pro-environmental or pro-social activities:* P(*CO_2* = 1 or *CO_2* = 2 | *LC*-4) = 0.10 + 0.51 = 0.61; *Provision of additional benefits for employees (apart from those required by law)*: P(*EM_3* = 1 OR *EM_3* = 2 | *LC*-4) = 0.09 + 0.51 = 0.60

However, it can be noted that in the *LC*-4 class, the influence (on purchasing behaviour) of the following actions in relation to customers is slightly stronger: *Introducing facilities for customers (e.g. mobile applications, facilities for the elderly or simplification of contracts)*:

P(*CU_1* = 4 | *LC*-4) = 0.33 and *Taking care of the health and life of customers*: P(*CU_3* = 4 | *LC*-4) = 0.37.

6.5. Latent Class 5 (*LC*-5) – Customers ambivalent about companies' CSR activities in their purchasing behaviour

16.26% of all the observations belong to the fifth latent class. The customers did not explicitly determine whether CSR actions by food companies influence their purchasing behaviour. For all indicators, the estimated conditional probability values are highest for an indicator's value equal to 3 and range from 0.67 to 0.92. Thus, the *LC*-5 class contains customers who have an ambivalent attitude towards CSR activities by food companies. However, it should be noted that among all the CSR activities, one of them stands out slightly: *Taking care of the health and life of customers*: P(*CU_3* = 4 or *CU_3* = 5 | *LC*-5) = 0.27 + 0.04 = 0.31.

6.6. Latent Class 6 (*LC*-6) – Customers with varying attitudes about companies' CSR activities in their purchasing behaviour

The sixth latent class includes 24.57 % of all the observations and is difficult to characterise because of its heterogeneity. The impact of particular CSR activities on customers' purchasing behaviour is strongly variable.

The following CSR activities with reference to contractors have the weakest impact on customers' buying behaviour: *Starting cooperation with contractors taking pro-environmental/ pro-social activities*: P(*CO_2* = 1 OR *CO_2* = 2 | *LC*-6) = 0.14 + 0.43 = 0.57 and P(*CO_2* = 4 OR *CO_2* = 5 | *LC*-6) = 0.09 + 0.03 = 0.12; *Having and following written standards of conduct in relations with contractors*: P(*CO_1* = 1 OR *CO_1* = 2 | *LC*-6) = 0.18 + 0.34 = 0.52 and P(*CO_1* = 4 OR *CO_1* = 5 | *LC*-6) = 0.06 + 0.10 = 0.16. In contrast, the CSR activities shown further have the strongest impact on customers' purchasing decisions: *Taking care of the health and life of customers*: P(*CU_3* = 4 or *CU_3* = 5 | *LC*-6) = 0.39 + 0.48 = 0.87; *Introducing facilities for customers (e.g. mobile applications, facilities for the elderly or simplification of contracts)*: P(*CU_1* = 4 or *CU_1* = 5 | *LC*-6) = 0.39 + 0.40 = 0.79; *Counteracting social problems*: P(*SO_1* = 4 or *SO_1* = 5 | *LC*-6) = 0.38 + 0.25 = 0.63 and *Free of charge performance of works/services for the benefit of the local community*: P(*SO_2* = 4 or *SO_2* = 5 | *LC*-6) = 0.39 + 0.16 = 0.55.

7. Summary and conclusions

The study provides vital information on the impact of corporate social responsibility activities by food industry companies on customers' purchasing behaviour. The importance of this issue stems from the fact that knowledge about consumers is a very crucial field used by business entities.

The impact on customers' purchasing behaviour of 15 CSR activities undertaken by enterprises from several different groups (in relation to: the environment, society, employees, contractors, and customers) was examined. The six profiles of customer purchasing behaviour were identified. They were labelled and subjected to descriptive characteristics. Two obtained patterns refer to customers who almost always (*LC*-1) or often (*LC*-2) take CSR activities of food companies into account in their purchasing behaviour. In contrast, two profiles characterise customers who do not (*LC*-3) or rarely (*LC*-4) consider CSR actions of these enterprises in their purchasing behaviour. In one case (*LC*-5), the customers' attitude proved to be ambivalent. One pattern obtained (*LC*-6) appeared to be heterogeneous. The distinguished customers' profiles and their characteristics provide companies with knowledge of how customers differ in terms of how often they buy a product under the influence of information about the company's implementation of CSR activities in different areas. Of all the CSR activities analysed, one activity stands out: *Taking care of the health and life of customers* (*CU_3*) as having a particularly strong impact on customers' purchasing behaviour.

Świętokrzyskie Voivodeship is one of the voivodeships with a low level of development, included in the so-called "Eastern Poland" block. The results of the pilot study may contribute to development of food companies by increasing the effectiveness of influencing customers' purchasing behaviour by implementing specific CSR activities. However, the research methodology presented in the paper is universal in nature. It can be used to study the impact of various socially responsible activities on the purchasing behaviour of different populations. In the future, it is planned to expand the investigation throughout Poland.

Socially responsible activities allow companies to provide additional (beyond the product) value to customers. It is also an opportunity to generate own benefits in the form of, among other things, shaping customers' buying behaviour, which ultimately leads to an increase in the level of product sales and corporate profits. The results of the research enable companies to use resources more efficiently than before to carry out socially responsible tasks. Enterprises can perform those of their activities that most strongly influence the purchasing behaviour of the largest proportion of customers. Based on the characteristics of customer profiles, enterprises can plan their socially responsible activities more effectively, maximizing the chances of retaining current customers, attracting new ones, and thus increasing the level of sales of their goods.

The distinction of clusters and their descriptive characteristics is useful for companies that want to implement CSR activities and at the same time shape consumer purchasing behaviour. Based on the results of the research, companies can influence the purchasing behaviour of consumers, who include in their purchasing behaviour the fact that the companies from which they buy products implement socially responsible initiatives. The research results provide insight into which CSR activities are most likely to influence consumers' purchasing behaviour

The conducted study showed that latent class analysis (LCA) is the proper tool for analysing the qualitative data obtained in the questionnaire surveys.

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