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## Article

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Amfiteatru Economic Journal

## Provided in Cooperation with:

The Bucharest University of Economic Studies

*Suggested Citation:* Tanasă, Lucian; Ulman, Simona-Roxana; Cautisanu, Cristina; Brumă, Ioan Sebastian; Juravle, Daniel (2022) : Vegetables consumers' profile in the context of digitalization: Evidence from Romania, Amfiteatru Economic Journal, ISSN 2247-9104, The Bucharest University of Economic Studies, Bucharest, Vol. 24, Iss. 59, pp. 128-142, <https://doi.org/10.24818/EA/2022/59/128>

This Version is available at:

<https://hdl.handle.net/10419/281625>

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## VEGETABLES CONSUMERS' PROFILE IN THE CONTEXT OF DIGITALIZATION: EVIDENCE FROM ROMANIA

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### Please cite this article as:

Tanasă, L., Ulman, S.R., Cautisanu, C., Brumă, I.S. and Juravle, D., 2022. Vegetables Consumers' Profile in the Context of Digitalization: Evidence from Romania. *Amfiteatru Economic*, 24(59), pp. 128-142.

DOI: 10.24818/EA/2022/59/128

### Article History

Received: 30 September 2021

Revised: 18 October 2021

Accepted: 22 November 2021

### Abstract

The objectives of the European Green Deal are closely related to digitalization as a key factor in achieving them. Accordingly, this study aims at analysing the differences among the profiles of consumers from Romania regarding the method of payment used in online purchasing of fresh vegetables from local producers. Using Multiple Correspondence Analysis and Logistic Regression, main results showed similarity in consumers' profiles using debit card and bank transfer, where individuals with ages between 19-49, with an income in the household equal to at least 6,000 RON (1,213 EUR), having at least a Master's Degree and a high frequency of buying products online, are mostly included while, in the case of cash payment, the following characteristics were observed: age between 50-64, income between 3,000-4,499 RON (606-909 EUR), mainly Bachelor's Degree, and a low frequency of buying products online. Our results revealed that local vegetable producers should be prepared to adapt themselves to digitalization. People seem to be open to it and, for responding to such digital needs, the farmers must get out their comfort zone and become aware that this adaptation becomes a mandatory requirement on the actual market.

**Keywords:** digitalization, local vegetable producers, consumers' profile, on-line purchase, method of payment, short supply chains, Romania

**JEL Classification:** D01, D12, O14, Q13

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## **Introduction**

The European Green Deal (EGD) has been intended as a strategic and legislative plan with a significant impact on the European economy and society (Pîrvu, 2020), setting an ambitious target: Europe to become the first climate-neutral continent by 2050 (Pîrvu, 2020; Zlaugotne et al., 2020). It covers all sectors of economy (Pîrvu, 2020), including numerous strategies and plans, inclusively a “farm to fork” sustainable agriculture strategy (Siddi, 2020).

Going further and referring to the strategy related to agriculture, the Farm-to-Fork Strategy needs to move towards more sustainable and resilient food systems. Among the six principal objectives of this strategy – which feed into and are in turn influenced by other strategic objectives of the European Green Deal (Matthews, 2020), the ones regarding (1) encouragement of sustainable food consumption; (2) promotion of affordable and healthy food for all; (3) improvement of farmers’ position in the value chain – are the objectives followed up in the present study. A key factor in achieving the EGD objectives is the fact that the European Union should make the most of the potential of digital transformation. Accordingly, our paper mainly aims at analysing the profiles of the consumers of vegetables produced by local farmers that turn to digitalization in the process of promotion and distribution of their fresh products and that directly deliver them to customers’ doors within short supply chains. In detail, our focus was laid on observing the differences among consumers as a function of their most frequently method of payment, i.e. cash or helped by the bank as an intermediate, through bank card or bank transfer, and also on the preferred ways of obtaining offers and placing orders, i.e. online platform, web page, Facebook, e-mail, phone or others. Focus on the digitalization of vegetable producers comes to respond to the care for better informing consumers about the food they buy, gaining customers’ trust and loyalty, inclusively through digital means, as pointed out in the Farm-to-Fork Strategy of the European Green Deal (European Commission, 2019).

The “local” has been frequently associated with sustainable and healthy production and consumption patterns (DuPuis and Goodman, 2005), fostering the growth of niche products and allowing “weak” actors in the system – in particular, farmers – to challenge “big food” with alternative principles, values, organizational patterns, and business models (Morgan, 2010; Brunori et al., 2016). Consequently, while also following the special indications of the European Green Deal, our endeavour could represent a useful guide for local vegetable producer’s vs their relationship with customers, thus encouraging the consumption of sustainable food, while also improving farmers’ position in the value chain.

This is not an easy concern to answer, however our study aimed at capturing the indicative lines that delineate reality, although it will not provide ultimate general figures in this regard. Still, it could shape some specific peculiarities regarding the frequency of ordering, the preference for making a standing order, age, education, income, number of persons in household and other important elements capable of enriching the knowledge regarding the profiles of vegetable consumers as a function of their preferred method of payment. Accordingly, our findings could ultimately respond to the question regarding the way vegetable producers should manage the digitalization of their promotion and distribution processes for a more efficient orientation as to customers’ needs, preferences, and requirements.

This paper is structured in four parts. After the Introduction, section 1 deals with the scientific literature, and section 2 contains a description of the data and methodology used. The results are presented and discussed in section 3. The paper ends with the conclusions in section 4.

## 1. Review of the scientific literature

Digitalization has been identified as one of the major trends within a society, affecting both people's life and business environment (Parviainen et al., 2017). In this way, the adaptation and utilization of digital technologies are imposed by the actual fast-changing context (Annarelli et al., 2021). Across the literature, the many positive effects of digitalization within an organization are pointed out, such as: improving work efficiency, innovation, and quality of management decisions, reducing costs, increasing company visibility and communication, putting the customer in the centre of activities (Parviainen et al., 2017; Baber, Ojala and Martinez, 2019; Stoyanova, 2020; Brumă et al., 2021). In addition, awareness on this potential goes closely together with understanding and accepting the inevitable transition (Stoyanova, 2020).

Moving on and pointing out a more punctual aspect, as Baber, Ojala and Martinez (2019, p. 4997) mentioned, digitalization of delivery channels and its impact on firms' business models represent relatively new phenomena. In this respect, the first aspect to be pointed out is, as also mentioned by Krasyuk et al. (2020), that the changes registered in the behavior of the consumer, who has to be perceived "as a full participant in the business ecosystem", should determine changes in the manner in which the distribution channels are designed and coordinated, from the perspective of digital connectivity and transition to a more complex system (Krasyuk et al., 2020). In detail, it is generally accepted that a deep understanding of consumer's behavior is of great importance for all companies (Kotler and Keller, 2006; Ulman and Dobay, 2016; Krasyuk et al., 2020). Accordingly, the facets of the buying process should also be taken into consideration (Mihart, 2012), this perspective potentially guiding the companies to direct their marketing communications and actions, distribution (and the related range of activities) included, starting from consumer needs and interests (Kitchen et al., 2004).

In this respect, the interaction between buyers and sellers, assured through digital means (Baber, Ojala and Martinez, 2019) like online platforms, Facebook, web pages, etc., have a critical role to firms, providing content and related services (Cortimiglia et al., 2011; Diba and Wagner, 2015) and helping them easily and quickly reach many potential customers (Cortimiglia, Ghezzi and Renga, 2011; Diba and Wagner, 2015). The use of an integrated approach to Internet marketing (Achtenhagen, Melin and Naldi, 2013), which confidently leads to good results (increasing the number of incoming addresses, i.e., calls, orders; increasing sales, increasing market share, etc.) could bring about advantages, inclusively for agribusiness enterprises, over competitors. Before choosing the most effective tools for product promotion, it is very important to determine the main groups of future consumers and the product promotion and/or distribution strategy for each target group, based on detailed research, as Popova et al. (2020) also pointed out.

Unfortunately, most enterprises in the field of agriculture are still fundamentally far from what modern interactive media could offer (Popova et al., 2020), especially in the countries – Romania included – having not yet reached the last stage of development, i.e. the innovation-based economies (Brumă et al., 2021). It is on the last place out of 27 EU Member States in the 2021 edition of the Digital Economy and Society Index (DESI, 2021, p. 3). In terms of connectivity, progress continued in 2020, but the adoption of services has been slower. Connectivity, human capital, e-government, digital public services and local digital ecosystems, digitalisation of enterprises, investments in digital capabilities and the implementation of advanced technologies, as areas of digital policy, are included in the

National Recovery and Resilience Plan (DESI, 2021). In the context of digital economy development, BTL market solutions and tools for the integrated Internet marketing, are of interest, the technologies proposed by Internet for agricultural and processing enterprises involving especially contextual advertising, promotion in social networks, creation of an online store, etc. (Popova et al., 2020).

Even though the importance of digitalization is well-known, companies are often struggling hard to attain its potential impact and benefits, meeting many obstacles in the process. On one hand, this requires a major change/ paradigm shift in habits and ways of working, based on collaboration and intensive interactions (Parviainen et al., 2017), in the context in which the problems that farmers are facing are diverse, ranging from lack of access to information related to inputs and markets, financing difficulties, up to lack of ability to analyse market data and forecast proper production, etc. (Vlachopoulou et al., 2021).

On the other hand, a recent study (Brumă et al., 2021) emphasized that, in a punctual case, a community of consumers interested in a distribution system best adapted to the digital transformation of the contemporary society does exist. Moreover, when searching for information and placing orders, consumers declared themselves interested in having access to additional information about the purchased products, as also confirmed by Annunziata et al. (2016). These findings emphasized the real need for digital transformation, aimed at developing media channels for the presentation of product offering and for order management, inclusively in terms of implementing the necessary measures for card payments and bank transfer, if 47% of the respondents declared they prefer such a system (Brumă et al., 2021). Our study appears as an ongoing endeavour for completing these results and offering a more general perspective, while extending the initial findings to a larger number of consumers, from a larger geographical area, and delineating the profiles of vegetable consumers as a function of the method of payment selected with empirical tools.

## 2. Research methodology

The *aim of the present study* is to determine consumer's profile vs the payment method used in online purchasing of fresh vegetables from local producers.

The *objectives of the research* are related to:

- Identifying the reasons for orientation towards socialization channels;
- Determining consumer profiles for each payment method;
- Investigate the link between socio-demographic variables and payment methods used.

We start from the following *hypotheses*:

*H1.* In the case of vegetable consumers, there is a high openness in turning on modern social channels for obtaining information and offers and placing orders.

*H2.* Consumer profiles for each payment method (debit card, cash payment and bank transfer) differ depending on various socio-demographic variables.

*H3.* The payment method that is used by the vegetable consumers is significantly influenced by socio-demographic aspects such as age, gender, level of education, and income.

To this end, in the period between 10 April and 15 May 2020, the Rural Development Research Platform developed a questionnaire which was applied nationwide.

The respondents were contacted *via* social media networks (mainly Facebook, since it is the most accessed social media platform in Romania), e-mail and telephone, as well. In the process of collecting the data, for ensuring the respondents' anonymity, no personal identification data were requested. They were informed about their free participation, ensuring the withdrawing at any time from the study, without repercussions.

Respondents were grouped into three categories, based on their responses regarding the method of payment used: debit card, cash payment and bank transfer. Each of the respondents had to answer some questions about frequency of ordering, quantity of products ordered, price that they are willing to pay and socio-demographic data. We mention that the relationship between the payment method chosen by the client and other socio-demographic variables has not been extensively analysed across the literature. However, there are several studies that addressed the issue (Mascarenhas and Phad, 2021; Sowmya and Hebbar, 2021), highlighting especially factors related to age, educational level, and gender. Moreover, elements such as the agreed method of payment, the frequency of purchases, the interest for a subscription, etc. are variables that address the relationship between producer and consumer, meeting the objectives set out in this study. Table no. 1 listed the variables used in constructing the three consumer's profiles. The variables reflect the questions from the questionnaire and their possible answers. Thus, no transformations were performed on the variables before their use in the study.

**Table no. 1. Description of variables**

Variable	Description	Reference category
Payment_Method	The payment method agreed by the respondent for the products ordered online (1 = Debit card, 2 = Cash payment, 3 = Bank transfer).	None
Frequency	Frequency of purchasing fresh vegetables (0 = Low, 1 = High).	0
Subscription	Interest for the delivery of products ordered online based on a monthly subscription (0 = No, 1 = Yes).	0
Quantity	Quantity of products the respondent is interested in ordering online from local producers (0 = Small (maximum 5 kg), 1 = Large (at least 5 kg)).	0
Price	Minimum price that the respondent would be willing to pay for direct delivery from local producers (0 = Low (maximum 100 RON, approx. 20 EUR), 1 = High (minimum 100 RON, approx. 20 EUR)).	0
Age	Respondent's age (1 = 19-34, 2 = 35-49, 3 = 50-64, 4 = 65+).	1
Education	Respondent's level of education (1 = Middle School – UNESCO (2011), levels 1 and 2, 2 = High School – UNESCO (2011), level 3, 3 = Bachelor's Degree – UNESCO (2011), level 6, 4 = Master's Degree – UNESCO (2011), level 7, 5 = PhD – UNESCO (2011), level 8)	1
Gender	Gender of respondent (0 = Male, 1 = Female)	0
No_Persons	Number of people living in the household, including the respondent (codes from 1 to 6)	1
Income	Income at household level (1 = <3,000 RON, approx. 606 EUR, 2 = 3,000-4,499 RON, approx. 606-909 EUR, 3 = 4,500-5,999 RON, approx. 910-1,212 EUR, 4 = 6,000-7,499 RON, approx. 1,213-1,515 EUR, 5 = 7,500-8,999 RON, approx. 1,516-1,818 EUR, 6 = 9,000-10,499 RON, approx. 1,819-2,121 EUR, 7 = 10,500 + RON, approx. 2,122+ EUR)	1

For determining consumers' profiles, the following three steps were established: (1) running a descriptive analysis of the respondents, considering their socio-demographic characteristics (i.e., gender, age, and educational level) and aspects regarding the communication with local producers; (2) applying the Multiple Correspondence Analysis (MCA) to identify the associations between the variables considered; (3) applying Logistic Regression models in order to determine which factors have significant impact on the probability of using a certain method of payment.

MCA aims at identifying a group of respondents with a similar profile of their answers to the questions of the survey, and also the associations among the categorical variables (Abdi and Valentin, 2007). Regarding Logistic Regression, it is a process of modelling the probability of a discrete outcome given several input variables. This type of regression is an extremely robust and complex method for the prediction of dichotomous classification, representing a method used for classification when the aim is to identify if the statistical units belong to a specific category or another (Edgar and Manz, 2017).

### 3. Results and discussion

#### 3.1. Descriptive analysis

The sample size comprised 1,788 respondents from urban areas. The number of valid answers is higher than the estimated sample size (1,068) in the case of Romanian population, while considering the 95% confidence level and the 3% margin of error. Figure no. 1 shows the structure of the sample according to the socio-demographic variables considered.

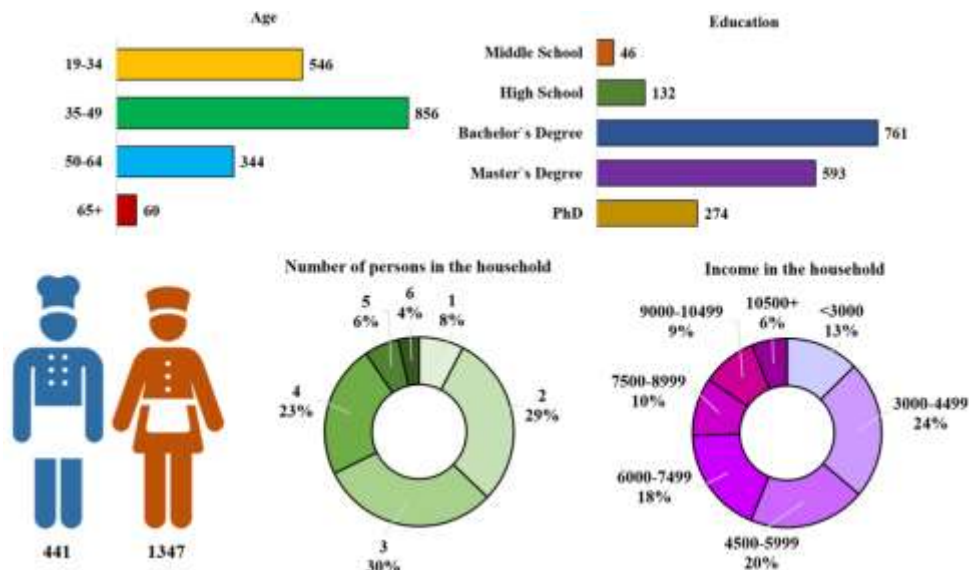


Figure no. 1. Sample structure by age, education, gender, number of persons in the household, and income in the household

Source: Authors' contribution using Tableau Public 10.3

In terms of gender, our respondents are represented by 441 males and 1,347 females with ages ranging between 19-34 years (546 respondents) - 35-49 years (856 respondents) - 50-64 years (344 respondents) to 65+ years (60 respondents). The largest group occurs in the 35-49 age range, representing 47.39% of all respondents. The last age group (65+ years) registered the lowest frequency (3.32%). In terms of educational level, 90.14% of the respondents have higher education, levels 6-8 according to UNESCO (2021), and 48.01% of them also have master's or PhD studies, levels 7-8 according to UNESCO (2021). The number of persons in the household is another important indicator in our investigation, an unequal distribution being observed in this regard, namely: 50% respondents with 3 (30%) or less than 3 persons in their household (37%), 23% of them coming from households with 4 persons, while the rest of the persons interviewed have larger families. Regarding the monthly income, it also varies from less than 3,000 RON, approx. 606 EUR (13% of the respondents) to more than 10,500 RON, approx. 2,122 EUR (6%), the higher part of them (44%) earning between 3,000 and 5,999 RON, approx. 606-1,212 EUR (Figure no. 1).

In terms of ways of obtaining offers and payment methods used, it can be observed that: 1) the persons preferring to pay with a debit card have an approximately similar preference for obtaining offers from online platforms (29.20%), sites (30.82%) and Facebook (28.55%); 2) the same situation of equilibrium could be observed for the persons that prefer the bank transfer as way of payment for their vegetable orders (25.1%; 27.8%, and 33.59%, respectively); 3) on the contrary, when cash is used, the tendency seems to prefer especially Facebook (38.22%), but also sites or online platforms, even if in lower percentages (23.76% and 23.55%, respectively); 4) a low tendency to prefer e-mail or other ways of obtaining offers (like phone messages or direct calls) (Figure no. 2). These results confirm hypothesis H1.

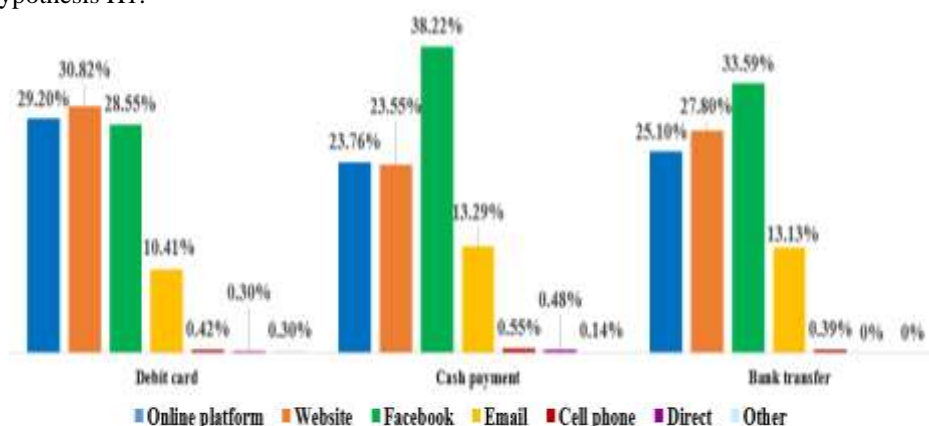
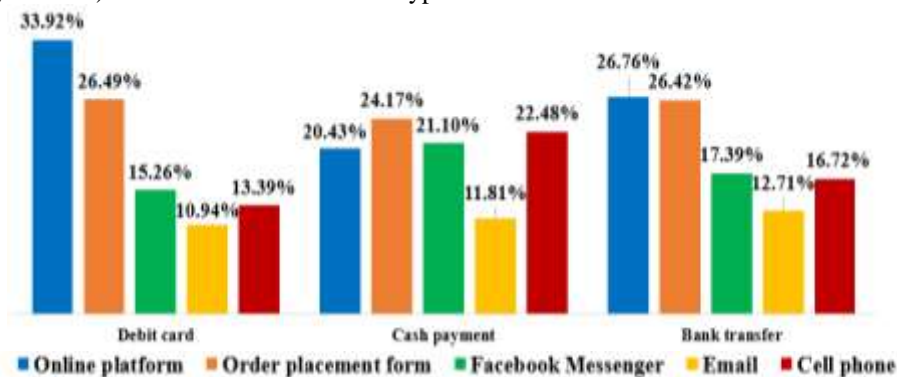


Figure no. 2. Modalities of obtaining offers and payment methods used

Source: Authors' contribution using Tableau Public 10.3

Analysis in terms of placing offers and payment methods used shows that: 1) the persons preferring to pay with a debit card have an approximately similar preference for placing offers on online platforms (33.92%), online order form (26.49%), message on Facebook (15.26%), e-mail (10.94%) or phone (13.39%); 2) an almost similar situation could be met for the persons that prefer bank transfer as way of payment for their vegetable orders (20.43%, 24.17%, 21.1%, 11.81%, and 22.48%, respectively); 3) in the same manner, when cash is used, the tendency seems oriented towards online platform (26.75%) or order form

(26.42%), but also Facebook or phone, in approximately similar percentages (17.39% and 16.72%, respectively), while e-mail seems to be the least preferred means (12.71%); 4) in the case of placing orders, the more traditional methods, like phone or e-mail, are still among the main preferences of vegetable customers, unlike the case of offers obtaining (Figure no. 3). These results confirm the hypothesis H1.



**Figure no. 3. Modalities of placing offers and payment methods used**

*Source: Authors' contribution using Tableau Public 10.3*

As shown in Figure no. 4, when analysing the way customers prefer to buy in terms of products and quantities, in general, vegetable consumers prefer to choose the products and quantities they bought each time. In this way, the basket with pre-set products and quantities seems not the best option, whether it's those who buy with debit card, cash, or bank transfer, in the case in which only 8.58% of the respondents have chosen it.



**Figure no. 4. Preference for placing offers and payment methods used**

*Source: Authors' contribution using Tableau Public 10.3*

In detail, (1) the persons who buy with debit card and prefer a pre-set shopping basket represent only 8.28% of the total respondents using this method of payment, (2) the ones that use cash and choose the pre-set basket are 8.5%, while (3) the ones using online transfer and preferring a shopping basket with pre-set products and quantities represent 10.95% of the respondents using such payment method. In this way, it can be assumed that most respondents, whichever their preferred method of payment, prefer to choose each time the type of products and specific quantities bought.



for each of the estimated models, taking into consideration the payment method frequently used by the respondents when they buy products online.

The results obtained in the model estimated for the respondents who mentioned debit card as the payment method used reveal that age, education, number of persons living in the household and income in the household represent significant factors for choosing it (Table no. 2). The influence of age and number of persons living in the household is a negative one, an increased level of each of these two variables determining a decrease in terms of the probability to use debit card as a payment method (Coef = -0.183, Prob = 0.01 for Age and Coef = -0.191, Prob = 0.01 for No\_persons). The results also indicate that education and income in the household have a positive influence on the dependent variable. In this way, an increase in their level determines an increase in the probability of using debit card as a payment method, as well (Coef = 0.356, Prob = 0.01 for Education and Coef = 0.163, Prob = 0.01 for Income).

**Table no. 2. Econometric modelling results**

Variable	Debit card		Cash payment		Bank transfer	
	Coefficient (Std. error)	Exp(B) [Wald]	Coefficient (Std. error.)	Exp(B) [Wald]	Coefficient (Std. error.)	Exp(B) [Wald]
Frequency	0.127 (0.115)	1.136 [1.233]	-0.017 (0.116)	0.983 [0.022]	-0.377* (0.210)	0.686 [3.252]
Subscription	0.119 (0.110)	1.126 [1.162]	0.059 (0.112)	1.061 [0.279]	-0.652*** (0.216)	0.521 [9.134]
Quantity	-0.109 (0.178)	0.896 [0.378]	0.065 (0.179)	1.067 [0.132]	0.159 (0.305)	1.172 [0.266]
Price	-0.040 (0.158)	0.961 [0.064]	-0.137 (0.160)	0.872 [0.737]	0.515** (0.254)	1.673 [4.085]
Gender	-0.143 (0.126)	0.867 [1.281]	0.107 (0.128)	1.113 [0.700]	0.128 (0.242)	1.136 [0.277]
Age	-0.183*** (0.070)	0.833 [6.732]	0.244*** (0.071)	1.277 [11.741]	-0.217 (0.135)	0.805 [2.575]
No_Persons	-0.191*** (0.048)	0.827 [15.855]	0.207*** (0.048)	1.230 [18.552]	-0.040 (0.088)	0.961 [0.175]
Education	0.356*** (0.062)	1.428 [32.912]	-0.392*** (0.063)	0.676 [38.778]	0.120 (0.115)	1.128 [1.094]
Income	0.163*** (0.034)	1.177 [23.684]	-0.206*** (0.035)	0.814 [35.293]	0.115* (0.060)	1.122 [3.737]
Constant	-0.982* (0.536)	0.375 [3.359]	-0.632 (0.543)	1.882 [1.354]	-2.336** (0.968)	0.097 [5.822]
Hosmer and Lemeshow Test	9.478 [0.304] <sup>(a)</sup>		3.108 [0.927]		8.327 [0.402]	
Omnibus Test	127.491 [0.000]		166.326 [0.000]		42.531 [0.008]	

Notes: \*, \*\* and \*\*\* show the statistical significance of the regression coefficient at 10%, 5%, and 1% level, respectively; <sup>(a)</sup> the values in [ ] brackets represent P-values corresponding to Chi-square from Hosmer and Lemeshow Test and Omnibus Test.

Source: Results obtained using R 4.1.1

In the model in which the dependent variable stands for the probability to use cash payment as the payment method, the results contradict those obtained in the previous model: variables age and number of people living in the household have a positive impact on the probability of

using cash payment (Coef = 0.244, Prob = 0.001 for Age and Coef = 0.207, Prob = 0.01 for No\_persons), while education and income in the household have a negative impact (Coef = -0.392, Prob = 0.01 for Education and Coef = -0.206, Prob = 0.01 for Income).

Table no. 2 also lists the results obtained for the respondents that frequently use bank transfer as a payment method. In this case, the increasing frequency of online use for placing offers or making a subscription reduces the probability of using bank transfer (Coef = -0.377, Prob = 0.10 for Frequency and Coef = -0.652, Prob = 0.01 for Subscription). Moreover, any increase in income in the household or in price has a positive effect on the probability of using this method of payment (Coef = 0.115, Prob = 0.10 for Income and Coef = 0.515, Prob = 0.01 for Price).

In more detail, several results may be mentioned regarding the differences between the reference category of a variable and the rest of categories. For instance, in all models, significant differences do exist among: 2 the reference category of Income (i.e., <3,000 RON, approx. <606 EUR) and the other ones, more precisely, an increase in the level of this variable positively predicts the probability of using debit card or bank transfer, and negatively predicts the probability of using cash payment. The same situation can be observed for the differences among the reference category of Education (i.e., Middle School, levels 1-2 according to UNESCO (2021)) and the other three categories, when the increase in the level of education determines an increase in the probability of using debit card and a decrease in the probability of using cash payment. Contrary to variables Income and Education, in the case of Age, an increase of its level beyond the reference category (i.e., 19-34 years) determines a decrease in the probability of using debit card as payment and an increase in the probability of using cash payment. Table no. 2 also indicates the goodness-of-fit-statistics for each of the models estimated. The high P-values of the Hosmer and Lemeshow test indicate that the models are well-fitted. In addition, the Omnibus tests of model coefficients give significant values ( $P < 0.05$ ), confirming the causal relationship between the proposed logit models and acceptance of the hypothesis that  $\beta$  coefficients are different from zero. The results obtained confirm the hypothesis H3.

All these empirical results show that, in the case of younger customers, a better adaptation to the general digitalization process within societies is observed, while the most appropriate way of payment for this category of public seems to be the debit card. The eldest (65+ years) seem to remain more loyal to the classical cash manner of payment, although they adapted themselves to online orders. In addition, another explanation could be that they are more attentive to their income and spending, because, on one hand, of their locking into a routine followed along their entire life, marked by the indigence of the communist period or, on the other, because of their actual life material conditions, once known that the Romanian retired persons are not especially an advantage group within the society from the perspective of income and/or social protection. The cautionary specificity of spending could be also observed when the influence of the number of persons from the household is analysed in relation to the method of payment. As the family grows, the avoidance of risks assumed in the case of transfers intermediated by banks, especially when discussing perishable products like vegetables, seems to be more pronounced, while the probability to pay with cash is higher in this case. In addition, this cautionary behaviour is confirmed by other results of the present analysis, in the case of the income variable, that is shown to negatively influence the probability of paying with cash. This means that, as the income decreases, the option for paying with cash in the case of vegetable purchasing is more frequent.

Consequently, as shown by our results, local vegetable producers should be prepared for adaptation to digitalization if they intend to have a durable, efficient, resilient, and profitable business. People seem to be open to online promotion, prepared for placing orders through digital channels, and also, especially in the case of younger persons, to pay their orders by debit cards or even by bank transfers. For responding to these digital customers' needs, the farmers have to get out of their comfort zone and work for the digitalization of their activity, reconfirming, in this way, the results of other studies (Abid and Jie, 2021; Gautam, Bhimavarapu and Rastogi, 2021; Popescu and Popescu, 2021; Prause et al., 2021). Once the orientation to the profiles of consumers is a must in the marketing theory, they have to understand that, even in the societies that have not yet reached the last stage of development and do not have innovation-based economies, this adaptation becomes a compulsory requirement which will allow vulnerable actors in the system – in particular, farmers – to actively and efficiently participate in the process of challenging “big food”.

Our study concretes into a shy initiative (but considered necessary by us) for observing the vegetable consumers profiles in function of their preferred method of payment in a certain context. Among the limits of this paper, we mention: (1) the sample structure that is applied on the urban areas, (2) the limited number of variables considered to be main important factors for contouring the profiles of the respondents, and (3) the impossibility to place the study in a specific international context.

### **Conclusions**

Digitization is an essential condition for the resilience of local vegetable producers in the years to come, and the COVID-19 Pandemic has created a good premise for this entrepreneurial digitization to start a little earlier than we would have expected, especially in the agri-food sector. The principle regarding the hegemony of the markets is reconfirmed, the Romanian consumer seeming to be prepared for making the transition to digitalization, in this case materialized through online orders and the use of dedicated platforms. Accordingly, producers have to respond to this need for digitalization, social media channels, especially Facebook groups, being the perfect link between consumers and agri-food producers. These appear to be the most accessible and resilient ones, outlining the bases for the digitization of the Romanian agri-food chains, both short and conventional ones. The present study highlights some specific peculiarities regarding age, education, income, number of persons in household, frequency of ordering, and preference for making a standing order, and other important elements, thus permitting understanding of the profiles of vegetable consumers as a function of their preferred method of payment.

A general low tendency to prefer e-mail or other ways of obtaining offers (like phone messages or direct calls) was observed, comparatively to online platforms, sites and Facebook, whichever the method of payment chosen. In this way, it can be concluded that consumers tend to orient more and more to modern social media channels for self-informing and obtaining offers while, in the case of placing orders, the (more) traditional methods, like phone or e-mail, are still among the main preferences of vegetable customers. Also observed was that the majority of respondents, whichever their preferred method of payment, opt for choosing each time the type of products and specific quantities, appearing as unprepared to a shopping basket with pre-set products and quantities, like the customers from other more developed markets.

Considering the main objective of the study – that of delineating consumers' profiles as a function of their preferred method of payment – it was found out that the profiles of customers using debit card and bank transfer were approximately similar, mostly including individuals with ages between 19-49, with an income in the household varying between 6,000-10,500 RON, approx. 1,213-2,122 EUR and higher, having at least a Master's Degree and a high frequency of buying products online. In the case of cash payment, consumers' profile is especially characterized by: age between 50 and 64, income in household between 3,000-4,499 RON, approx. 606-909 EUR, mainly Bachelor's Degree, and a low frequency of buying products online.

In addition, these findings showed that: (1) the eldest (65+) seem to remain more loyal to the classical cash manner of payment, although they adapted themselves to online orders; (2) as income decreases, the option for paying with cash for vegetable purchasing is more frequent; (3) as the family grows, the avoidance of risks assumed by transfers intermediated by banks, when discussing about perishable products like vegetables, seems to be more pronounced.

In this way, some general guidelines were established in terms of customers' responses and needs, in close relation with the digitalization of vegetable farmers. The obtained results showed the general orientation towards different channels of promotion and distribution, as a function of the method of payment chosen and also of the main determining factors about the probability of paying by debit card, cash or bank transfer. This represents the main contribution of this study, especially in the context in which we were not able to find specific studies that punctually analyse the same investigated problematic across the literature. Consequently, some clear digital customers' needs have been outlined, to which the farmers have to properly respond by getting out of their comfort zone and by working for a better integration of digitalization within their daily activity. Accordingly, these findings seemed to respond to the question regarding the manner in which vegetable producers should generally manage the digitalization of their promotion and distribution processes for a better adaptation to customers' needs, preferences and requirements that change over time.

**Acknowledgments:** The authors would like to thank their colleagues Codrin Dinu Vasiliu and Sebastian Doboş for their support in elaborating the questionnaire and data collection.

## References

- Abdi, H. and Valentin, D., 2007. Multiple Correspondence Analysis. In: *Encyclopedia of Measurement and Statistics*. SAGE Publications Inc.: Thousand Oaks, CA, USA.
- Abid, A. and Jie, S., 2021. Impact of COVID-19 on agricultural food: A Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis. *Food Frontiers*, [online] 2(4), pp.396-406. <https://doi.org/10.1002/fft2.93>.
- Achtenhagen, L, Melin, L. and Naldi, L., 2013. Dynamics of Business Models – Strategizing, Critical Capabilities and Activities for Sustained Value Creation. *Long Range Planning*. [e-journal] 46(6), pp.427-442. <http://dx.doi.org/10.1016/j.lrp.2013.04.002>.
- Annarelli, A., Battistella, C., Nonino, F., Parida, V. and Pessot, E., 2021. Literature review on digitalization capabilities: Co-citation analysis of antecedents, conceptualization and consequences. *Technological Forecasting and Social Change*. [e-journal] 166, p.120635. <http://dx.doi.org/10.1016/j.techfore.2021.120635>.

- Annunziata, A., Pomarici, E., Vecchio, R. and Mariani, A., 2016. Do Consumers Want More Nutritional and Health Information on Wine Labels? Insights from the EU and USA. *Nutrients*. [e-journal] 8, p.416. <http://dx.doi.org/10.1016/j.appet.2016.02.152>.
- Baber, W.W., Ojala, A. and Martinez, R., 2019. Transition to Digital Distribution Platforms and Business Model Evolution. In: *The 52nd Hawaii International Conference on System Sciences (HICSS 2019)*. Manoa, Hawaii: United States.
- Brumă, I.S., Vasiliu, C.D., Rodino, S., Butu, M., Tanasă, L., Doboş, S., Butu, A., Coca, O. and Stefan, G., 2021. The Behavior of Dairy Consumers in Short Food Supply Chains during COVID-19 Pandemic in Suceava Area, Romania. *Sustainability*. [e-journal] 13(6), 3072. <https://doi.org/10.3390/su13063072>.
- Brunori, G., Galli, F., Barjolle, D., Van Broekhuizen, R., Colombo, L., Giampietro, M., Kirwan, J., Lang, T., Mathijs, E., Maye, D., De Roest, K., Rougoor, C., Schwarz, J., Schmitt, E., Smith, J., Stojanovic, Z., Tisenkopfs, T. and Touzard, J.-M., 2016. Are Local Food Chains More Sustainable than Global Food Chains? Considerations for Assessment. *Sustainability*. [e-journal] 8(5), 449. <https://doi.org/10.3390/su8050449>.
- Cortimiglia, M.N., Ghezzi, A. and Renga, F., 2011. Mobile applications and their delivery platforms. *IT Professional* [e-journal] 13(5), pp.51-56. <https://doi.org/10.1109/MITP.2011.84>.
- DESI, 2021. Digital Economy and Society Index (DESI) 2021 Romania. *European Commission*. [online] Available at: <<https://digital-strategy.ec.europa.eu/en/policies/desi-romania>> [Accessed 9 December 2021]
- Diba, V. and Wagner, C., 2015. Success within app distribution platforms: The contribution of app diversity and app cohesivity. In: *Annual Hawaii International Conference on System Sciences*. Hawaii: United States.
- DuPuis, E.M. and Goodman, D., 2005. Should We Go “Home” to Eat?: Toward a Reflexive Politics of Localism. *Journal of Rural Studies*. [e-journal] 21(3), pp.359-371. <https://doi.org/10.1016/j.jrurstud.2005.05.011>.
- Edgar, T.W. and Manz, D.O., 2017. Research Methods for Cyber Security. *Syngress*. Cambridge, USA.
- European Commission, 2019. *The European Green Deal*. Brussels, 11.12.2019, COM(2019) 640 final. [pdf] Available at: <[https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC\\_1&format=PDF](https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF)> [Accessed 15 September 2021].
- Gautam, R.S., Bhimavarapu, V.M. and Rastogi, S., 2021. Impact of Digitalization on the Farmers in India: Evidence using Panel Data Analysis. *International Journal of Management and Humanities (IJMH)*. [e-journal] 6(1), pp.5-12. 10.35940/ijmh.L1372.0851221
- Kitchen, P.J., Brignell, J., LI, T. and Jones, G.S., 2004. The emergence of IMC: a theoretical perspective. *Journal of Advertising Research*. [e-journal] 44(01), pp.19-30. <https://doi.org/10.1017/S0021849904040048>.
- Kotler, P. and Keller, K.L., 2006. *Marketing Management*. 12th ed. New Jersey: Prentice Hall.
- Krasyuk, I., Krimov, S., Kolgan, M., Medvedeva, Y. and Khukhlaev, D., 2020. Conceptual Framework for Creating a Digital Business Ecosystem Based on Marketing. *IOP Conference Series: Materials Science and Engineering*. [e-journal] 940(1), 012055. <https://doi.org/10.1088/1757-899X/940/1/012055>.

- Mascarenhas, C. and Phad, S.P., 2021. A Study of E-consumer Behaviour towards E-goods (tangible goods) in Mumbai City (Byculla-E Ward). *Journal of Global Economy*. [e-journal] 17(3), 188-199. 10.1956/jge.v17i3.630
- Matthews A., 2020. Agriculture in the European Green Deal. *CAP Reform*. [online] Available at: <<http://capreform.eu/agriculture-in-the-european-green-deal/>> [Accessed 14 September 2021].
- Mihart, C., 2012. Impact of Integrated Marketing Communication on Consumer Behaviour: Effects on Consumer Decision – Making Process. *International Journal of Marketing Studies*. [e-journal] 4(2), 121-129. <https://doi.org/10.5539/ijms.v4n2p121>.
- Morgan, K., 2010. Local and Green, Global and Fair: The Ethical Foodscape and the Politics of Care. *Environment and Planning a Economy Space* [e-journal] 42(8), pp.1852-1867. <https://doi.org/10.1068/a42364>.
- Parviainen, P., Tihinen, M., Kääriäinen, J. and Teppola, S., 2017. Tackling the digitalization challenge: how to benefit from digitalization in practice. *International Journal of Information Systems and Project Management*. [e-journal] 5(1), pp.63-77. <https://doi.org/10.12821/ijispm050104>.
- Pîrvu, E.L., 2020. The European Green Deal – a Feasible Ambitious Initiative? *Journal of Danubian Studies and Research*. [e-journal] 10(1), pp.276-291.
- Popescu, G.C. and Popescu, M., 2021. COVID-19 pandemic and agriculture in Romania: effects on agricultural systems, compliance with restrictions and relations with authorities. *Food Security*. [e-journal] 1-11. 10.1007/s12571-021-01239-8
- Popova, A.D., Panchenko, Y.V., Chepeleva, K.V. and Shmeleva, Z.N., 2020. Modern tools for promoting foodstuffs in the conditions of the digital economy development. *IOP Conference Series: Earth and Environmental Science*. [e-journal] 548(2), 022016. <https://doi.org/10.1088/1755-1315/548/2/022016>.
- Siddi, M., 2020. What are the prospects for the European Green Deal? *London School of Economics*. [online] Available at: < <https://blogs.lse.ac.uk/europpblog/2020/07/16/what-are-the-prospects-for-the-european-green-deal/>> [Accessed 22 August 2021].
- Sowmya, P.K. and Hebbar, C.K., 2021. Impact of Digital Payment on Retail Shops-With Reference to Mangalore City. *EPRA International Journal of Research and Development (IJRD)*. [e-journal] 6(4), 187-191. 10.36713/epra2016.
- Stoyanova, M., 2020. Good Practices and Recommendations for Success in Construction Digitalization. *TEM Journal*. [e-journal] 9(1), pp.42-47. <https://doi.org/10.18421/TEM91-07>.
- Ulman, S.R. and Dobay, K.M., 2016. The New Consumer of Lifelong Learning Programmes. *International Journal of Communication Research*. [e-journal] 6(2), pp.187-195.
- UNESCO, 2011. *International Standard Classification of Education ISCED 2011*. [pdf] Available at: <<http://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf>> [Accessed 8 December 2021].
- Vlachopoulou, M., Ziakis, C., Vergidis, K. and Madas, M., 2021. Analyzing AgriFood-Tech e-Business Models. *Sustainability*. [e-journal] 13(10), 5516. <https://doi.org/10.3390/su13105516>
- Zlaugotne, B., Ievina, L., Azis, R., Baranenko, D. and Blumberga, D., 2020. GHG Performance Evaluation in Green Deal Context. *Environmental and Climate Technologies*. [e-journal] 24(1), pp.431-441. <https://doi.org/10.2478/rtuct-2020-0026>.