
THE FACTORS OF BUSINESS EFFICACY OF THE FOOD MARKET AND THEIR CORRELATION TO THE MARKETING IN FARMERS

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ABSTRACT

The relevant research subjects of this study are the contemporary models of economic studies, the factors of business efficacy of the food market, and the marketing of farmers. The aim of this transversal study was to define the latent structures of business efficacy and their linear correlation with the marketing of agricultural food farmers. The pertinent sample included (N=156) male farmers from Kolubara district, Serbia. The average age of participants was 44.26 ± 10.35 . The questionnaire regarding farmer's entrepreneurial success in food production was used in this research. The values of the Cronbach's alpha (α) coefficient of internal consistency were higher than 0.70, which means that the variables used in this research possess satisfactory psychometric criteria. Four components were extracted by analyzing the exploratory factorial analysis, with Kaiser-Guttman criterion, and the oblimin rotation of the variables. The extracted four-factor groups of latent dimensions, on the level of statistical conclusion of 0,01, were interpreted as: quality – FI, economic privilege – FII, social privilege – FIII, and competition – FIV, which together account for 68.26% of the variance. The obtained findings on the coefficient of internal consistency (Cronbach's) confirmed the reliability and validity of the applied measuring instrument, and thus future longitudinal studies can use it for examining the farmer population in Serbia.

Introduction

The increased interest in food supply and consumption indicates that consumers require quality, which means that there is an ethical context in understanding food consumption as a segment of social, economic, and ecological sustainability. That is why the function of

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food farmers is becoming more important, especially because consumers demand higher quality standards, such as nutritional value, healthy food, ecological methods of production (Shahnaj et al. 2023). That is the reflection on the current needs of consumers, and the increased conscientiousness of people who, even with limited finances, have a need to buy traditionally grown products from local farmers (Çakmakçı & Çakmakçı, 2023).

Incentive program for local food farmers gives farmers a chance to grow and develop economy, for example to create work positions, and create brands from local products. At the same time, this way of supporting local economies contributes to creating prerequisites for security during the times of crisis, as well as for positive demographic trends which are fundamental factors for healthy socioeconomic communities (Rossi et al., 2023). The aforementioned authors believe that qualitative and quantitative assessment of local food market improves economic, social, and ecological privileges, which leads to the increased possibility of employing locals. Transfer on knowledge and funding's is motivated, so is the intensified absorption of money at the local level. Additionally, social interactions which contribute to finding access to healthy food are also support and development of local markets, ecology and health (Vujić et al., 2019; Luković & Šilc, 2021; Đurović & Božić, 2022; Yang et al., 2023). Best ways to achieve this is to support farmers to use modern technologies to produce conventional foods.

The term local food marketplace implies narrow geographical region, distance 20 to 100km from the place where food is produced to the place food is delivered (Nosirov & Raximov, 2023). Relevant number of people uses local food marketplace (ecological, economic, and social) and that stems from the physically short distance between producer and consumer, which reduces the energy, time and transport spent, which leads to locally produced food keeping more of the organoleptic and nutritional properties. Additionally, increased awareness about the importance of local food generally increases public awareness about nutrition, its health and preventive characteristics, responsibility about managing and protecting the environment, and higher control of nutrition system (Umarjonovna, 2023). By decentralizing the production of traditional foods, food safety risks are being reduced, meaning that local production is regarded as the significant component of transition towards more sustainable method of food production. So, local food marketplaces imply other types of agri-food systems which include various forms which are characterized by the complete or partial elimination of the middleman between consumer and producer. Additionally, it primarily represents systems of small food producers. The main food producers in Serbia are family agricultural holdings (as the most efficient form of agricultural entrepreneurship), with quantitatively limited production and compliance to equal access to food market. Organizing local food market within the agri-food sector is an opportunity for small agricultural holdings. Chances given to agricultural producers are based on the stimulation of producers, by creating additional consumer values, which is a prerequisite for stable earnings. The possibility to stabilize production bases can be realized through local arrangements, by additional employment of local workforce and resources, which has an additional effect on the local community and employment rate (Lin et al., 2023).

Particularities of local food market are generated by excluding the middleman in the chain, so that producers become direct participants and have contact with consumers. That means that aside from production, the basic factor of efficacy is the skill of marketing decisions. Namely, before shopping, the consumer analyses the origin of a product, assesses the region of the product origin, specificities of the food quality, ingredients, organoleptic properties assessed by using sight, smell, taste, and touch, as well as the matter of tradition, seasonality, etc.

Food producers from Kolubara district organize food delivery in a conventional way, by using entrepreneurial tools which do not help them take full advantage of their real possibilities, so the strategic turn in marketing and operating activities is necessary. The causes for this are following: non-existence of one's own brand, unsuitable quality standards of visual communication, lack of direction and disjoint production (Hina et al., 2023). Additional problem is the lack of practical knowledge and skills in the marketing area. Aside from the lack of organization in marketing products, another problem may be the local network of producers necessary for creating joint centers for selling and distributing of goods. The products of local farmers can be bought from middlemen such as local grocers, or directly from farmers in their households. It should be said that consumers are willing to pay more for local food.

Keeping the findings of earlier research in mind, and the indisputable significance of the research matter, as well as the fact that identical studies have not been conducted in Serbia before, *the aim* of this cross-sectional study was to examine the latent structure of business efficacy of food farmers and its connection to the variables of marketing – product characteristics and brand. In accordance with the earlier empirical studies and the aim of the research, two *hypotheses* have been formulated: H_1 – it is expected that the application of the exploratory factor analysis – method of main components, will extract from the group of manifest morphological variables the most representative hierarchical latent structure of the factors of business efficacy of agricultural food farmers, and H_2 – it is expected that there will be intercorrelations between the manifest variables of marketing (product characteristics and brand) and factors of business efficacy of food farmers.

Methods

Participants and procedure

The pertinent sample included ($N=156$) farmers from Kolubara district, Serbia. The average age of participants was 44.26 ± 10.3 , age range 17-73 years. The empirical quantitative research was conducted on participants from: Valjevo, Lajkovac, Osečina, Ub, and Ljig during the month of June, 2023.

Before filling in the questionnaires, the participants were give detailed instructions and the aim of the research was explained to them, without explaining the purpose each measuring instrument in detail (in order to prevent desirable responding). The

participants were asked not to overthink the answers and in case of doubt choose the answer they lean more to. They were also told that they could quit at any time without consequences, and that the results would be analyzed solely on a group level. All participants gave their written consent to take part in this anonymous research. The testing took approximately 30 minutes, and it was conducted by the authors of this research. The research was approved by the science council of the Serbian Academy of Innovation Sciences in Belgrade, and was conducted in accordance with the ethical principles based on the Declaration of Helsinki.

Measuring instruments

A highly structured questionnaire (Jerčinović, S. (2019)) was taken for the purpose of this research, and it measures business efficacy of farmers – food producers. The measuring instrument included 34 items. The participant's task was to circle a number on a five-point Likert-type scale (1 = *I fully disagree*, 2 = *I mostly disagree*, 3 = *I neither agree nor disagree*, 4 = *I mostly agree*, and 5 = *I fully agree*). This questionnaire allows for measuring of intensity, not just the direction of participant's attitude towards the matter measured. Total score is presented as the arithmetic mean of the answers to all the claims presented in the questionnaire, where higher score means higher level of participant's business efficacy. The internal reliability of the measuring instrument was measured using the *Cronbach's alpha* coefficient of internal consistency, which for all items was $\alpha = 0.81$, which for the questionnaire of this size suggests high level of consistency (Kline, 2011).

Statistical methods of data processing

The analysis of the reliability of the questionnaire regarding farmer's entrepreneurial success in food production in this cross-sectional study was conducted using the Cronbach's alpha, while the Pearson correlation coefficient and explorative factorial analysis with oblimin rotation and Kaiser–Guttman criterion were used to assess the structure of the factor of business efficacy of the food market and its linear correlation to marketing. Using the SPSS version 17.0 for Windows, metric characteristics and factorial structure of the questionnaire were determined. Statistical conclusions were conducted on the significance level of ($p \leq 0.05$).

Results and discussion

Thorough marketing construct is based on four main instruments of management (product, price, presentation, and distribution), and it is a prerequisite for achieving competition, for example, determining criteria for product marking and quality, origin, methods of production and branding. This allows producers to become the most significant food suppliers in the local market (Dilip et al., 2021; Graciola et al., 2021).

The descriptive parameters of the examined variables of marketing are shown in Table 1. Analyzing the descriptive scores has confirmed that the participants consider variables

product characteristics and product brand relevant determinants in determining partial strategy of managing product marketing.

Table 1. Basic descriptive parameters of the marketing variable

Variables	M	SD	Sk	Ku
Product characteristics	3.96	0.87	0.17	0.32
Brand characteristics	2.98	1.14	0.36	0.56

Legend. M = arithmetic mean; SD = standard deviation; Sk = standardized skewness; Ku = standardized kurtosis. Standard error value (*SE*) of Sk is 0.07, and of Ku is 0.22.

Testing the scores of the normality distribution, it has been determined that the values of the standardized asymmetry coefficients – skewness and kurtosis, are acceptable because they range within the standard values, between ± 1 (Tabachnick & Fidell, 2012), which indicates that there are no statistically significant variations of the scores from the Gaussian bell curve which is a prerequisite for conducting further parametric analyses.

With the aim of reducing 18 items, as a starting group of manifest variables, in the questionnaire regarding farmer's entrepreneurial success in food production and the extraction of its latent dimensions, exploratory factor analysis (EFA), method of main components, is shown in Table 2 (Bro & Smilde, 2014). Before applying this multivariate statistical method, the *Kaiser-Meyer-Olkin coefficients* ($KMO = 0.79$) were calculated in order to discard all the variables that have insufficient amount of information, and the Bartlett's test of Sphericity $\chi^2(55)=483,17$ ($p \leq 0.01$) was conducted in order to test the null hypothesis of the non-existence of the significant correlation between the manifest variables, which all indicates that the prerequisites for conducting the factorization are met.

Table 2. Characteristic roots and the percentage of the explained variance

Main components	Lambda (λ)	% of total variance	cumul. % of variance
1	14.05	31.24	31.24
2	4.55	9.98	41.33
3	3.50	7.82	50.09
4	2.69	5.99	55.16

Legend. Lambda (λ) = maximum value of the characteristic root-like value; % of total variance – percentage of the proportion of the explained variance (sum of the square of standard deviation); cumul. % – percentage of the proportion of the explained variance

Using the *Promax* rotation, with *Guttman-Kaiser* criterion, and with the assumption of the minimum variance of the error in measuring, four characteristic roots were extracted which account for 68.26% of the mutual variability of the group of manifest variables, where first characteristic value accounts for 31.24% of the total variability of all 10 original variables, second accounts for 9.98%, third 7.82%, and fourth 5.99%. That meets the criteria for reproducing the valid information contained in the all analyzed variables. So, the multivariate contribution in explaining the total square standard deviation of the applied system of the variables belongs maximally to the first reduced characteristic

root, because it is condensed using the projections, which have maximum variability, meaning the biggest linear correlations with the manifest variables. It is clear that four isolated characteristic roots contain significant proportion of the all variations projected in the factorial space, so they realistically transmit relevant data and represent basic latent dimensions in this population of participants. Adding up the partial values of the isolated characteristic roots from the condensed matrix, one can see that together they take up more than $\frac{1}{2}$ of the examined space, which points to the relatively valid informativeness of the isolated latent dimensions which are applicable to the variance of the applied sample of variables and the objectivity in measuring which varies within acceptable limitation.

Table 3 shows the factorial saturations of the manifest variables.

Table 3. Matrix of the group of factorial saturations of the used questionnaire

Items	F ₁	F ₂	F ₃	F ₄
1. We always invest in improving the quality of our products	0.79			
2. We are ecologically responsible	0.74			
3. We try to apply ecological standards in the production process	0.77			
4. We continually work of securing the quality of our products	0.69			
5. We are directly involved in preserving biodiversity	0.67			
6. Our selling/production methods allow for some other/different ways of financing		0.79		
7. We sell our products at a higher price		0.75		
8. By cooperating with other producers it is possible to balance current business expenses		0.73		
9. We regularly talk with consumers about the importance of producing and buying local food		0.70		
10. When offering our products we also try to have a creative influence	0.52		0.76	
11. We always talk about and emphasize origin of our products	0.68		0.62	
12. Business efficacy is based on continuous development and learning	0.57		0.75	
13. We always work on creating same products	0.55		0.60	
14. We are directly involved in creating jobs	0.49		0.53	
15. Cooperation with other producers enables us to have current market				0.76

Items	F ₁	F ₂	F ₃	F ₄
16. Cooperation with other producers intensifies or position on the market				0.65
17. We are always working on improving our products				0.53
18. Local producers are not our rivals but an opportunity for cooperation				0.71

The first main component, the linear combinations of the observed variables, has five items: We always invest in improving the quality of our products, We are ecologically responsible, We try to apply ecological standards in the production process, We continually work of securing the quality of our products, and We are directly involved in preserving biodiversity. Analyzing the first main components, where we have shown only correlations above 0.30, we can see the first isolated factor, which is highly saturated, and can be called F_I – *Quality*. The second main component included four items: Our selling/production methods allow for some other/different ways of financing, We sell our products at a higher price, By cooperating with other producers it is possible to balance current business expenses, and We regularly talk with consumers about the importance of producing and buying local food. That component can theoretically be identified as F_{II} – *Economic privilege*. The third main component included five items: When offering our products we also try to have an educational influence, We always talk about and emphasize origin of our products, Business efficacy is based on continuous development and learning, We always work on creating same products, and We are directly involved in creating jobs. Based on the saturations of the items grouped within this main component, this factor F_{III} can hypothetically be interpreted as *Social privilege*. The fourth main component has four items: Cooperation with other producers enables us to have current market, Cooperation with other producers intensifies or position on the market, We are always working on improving our products, and Local producers are not our rivals but an opportunity for cooperation. Based on the saturation of the items within this main component, F_{IV} can be defined as *Competition*.

By comparing the obtained findings from this research, one can see that they are in accordance with the existing results of the earlier empirical studies (Hackl et al., 2023; Hussain et al., 2023; Jerčinović, 2019; Niloy et al., 2023; Sandberg et al., Sandberg et al., 2023; Vrabčová & Urbancová, 2023; Wati, et a., 2023). So, upon conducting the exploratory factor analysis, and reducing 18 manifest variables, four factor model was condensed to following latent dimensions: *Quality* (F_I), *Economic privilege* (F_{II}), *Social privilege* (F_{III}), and *Competition* (F_{IV}), which means that the hypothesis H₁ is confirmed, or that it is expected that the application of the exploratory factor analysis will extract the hierarchical latent structure – the factors of business efficacy of agricultural food farmers.

The correlational analysis has been conducted with the aim of examining the statistically significant linear correlations between certain variables of the marketing and business efficacy of food farmers (Table 4).

Table 4. Intercorrelations (r) between the scores on the variables marketing and business efficacy of food farmers

Variables	Product characteristics	Product brand	Quality	Economic privilege	Social privilege	Competition
1. Product characteristics	–					
2. Product brand	0.18*	–				
3. Quality	0.51**	0.50**	–			
4. Economic privilege	0.19**	0.60**	0.53**	–		
5. Social privilege	0.16*	0.31**	0.42**	0.61**	–	
6. Competition	0.53**	0.42**	0.37**	0.57**	0.59**	–

Annotation. Level of statistical significance * $p \leq 0.01$; ** $p \leq 0.01$.

The calculated *Pearson correlation* coefficients have positive indicators and point to statistically significant and moderate correlation between the variables product characteristics and quality ($r = 0.51$, $p \leq 0.01$), relatively low correlation between that variables and the variable economic privilege ($r = 0.19$, $p \leq 0.01$), and the variables product characteristics and social privilege ($r = 0.16$, $p \leq 0.01$). Additionally, statistically significant correlation has been found between product characteristics and competition, with positive direction and moderate intensity ($r = 0.53$), with the probability of 99%. The aforementioned data shows that participants with the higher level of product characteristics are more likely to experience economic and social privilege, and vice versa. Also (on the level of 0,01), participants with better product characteristics perceive higher level of competition.

Based on the defined statistically significant parameters in the correlation matrix, one can see that the agricultural products of farmers dominantly correlate to the latent variable quality which they deliver, which represents the possibility for more efficient planning in all stages of marketing. Even though the economic privileges are a direct consequence of planning and conducting marketing activities, one can see that investing in product development is a chance to increase profit, an option for various alternative types of financing, as well as a chance to create more jobs and thus improve general economic climate and competition among the examined sample of farmers. Despite the fact that the scores of Pearson product-moment correlation have shown that product development and its general market characteristics are in intense correlation with achieving social influence on the market, it should be pointed out that the local farmers' agricultural products offer contributes to the factor quality of life of local population, as well as the social emphasis of the economic privileges. So, when explaining the construct marketing food, developing product brand has plays an important role, which confirms how important it is to develop and create one's own brand of food producer. Therefore, on the level of statistical conclusion of 0,01, the significance of the product brand is in direct intercorrelation with the factor product quality, and with

the factor economic privilege which food producers can take into account along with the development of personal brand. Also, the identical correlational role is given to the factor competition. Finally, it is significant to point out the slightly lower statistical significance between the latent variables of product brand and social privilege. So, the calculated Pearson product-moment correlation with the significance level ($p \leq 0.01$, $p \leq 0.01$) indicate that the tested hypothesis on the linear correlation between the manifest variables of marketing (product characteristics and product brand) and factors of business efficacy in agricultural food farmers has been confirmed.

With the insight into the obtained results of this research, it can be seen that they are in accordance with the findings of previous empirical studies (Ansarii et al., 2021; Fernando et al., 2019; Hameed et al., 2020; Islam et al., 2022; Mazwi et al., 2019; Ntshangase et al., 2018; Rambe & Khaola, 2021; Rashid, et al., 2023).

Conclusion

The aim of this cross-sectional study was to examine the latent structure of the business efficacy of agricultural food farmers and their interaction with the variables of marketing – product characteristics and product brand, using the sample of farmer population. The pertinent sample consisted of 156 Serbian agricultural food producers from western Serbia, age 17-73. The average age of participants was 44.26 ± 10.3 .

The Croatian questionnaire for assessing the variables of marketing and business efficacy of agricultural food farmers offers very useful and reliable information, and can be used in future empirical studies on Serbian population.

The research findings of the exploratory factor analysis, on statistical level of conclusion of 0,01, show that there is a four-factor model of latent dimensions which is defined as: quality (F_I), economic privilege (F_{II}), social privilege (F_{III}), and competition (F_{IV}). The results of the Pearson product-moment correlation coefficient ($p \leq 0.01$, $p \leq 0.01$) indicate that there is statistically significant and moderate linear correlation (of positive direction) between the variables of marketing – product characteristics and product brand, and the factors of business efficacy – quality, economic privilege, social privilege, and competition among agricultural food farmers, which means that the increase in the value of manifest marketing variable follows the increase of the value of the variable business efficacy on food market. Therefore, the obtained factorial and correlational results can serve as basis for reaching conclusions about the structure of the factor of business efficacy of the food market and correlation of marketing among agricultural food producers.

Conflict of interests

The authors declare no conflict of interest.

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