




Article

Research on the Determination of the Factors Affecting Business Performance in Beekeeping Production

Miroslav Čavlin ^{1,2}, Nedeljko Prdić ^{3,*}, Svetlana Ignjatijević ^{1,*} , Jelena Vapa Tankosić ¹ , Nemanja Lekić ⁴ and Sara Kostić ⁵ 

¹ Faculty of Economics and Engineering Management, University Business Academy, Cvečarska 2, 21000 Novi Sad, Serbia

² Subotica Tech—College of Applied Sciences, Marka Oreškovića 16, 24000 Subotica, Serbia

³ JKP Tržnica, Novi Sad, Žike Popovića 4, 21000 Novi Sad, Serbia

⁴ Department of Business and Information Studies, Belgrade Business and Arts Academy of Applied Studies, Kraljice Marije 73, 11050 Belgrade, Serbia

⁵ Faculty of Economics in Subotica, University of Novi Sad, Dr Sime Miloševića 16, 21000 Novi Sad, Serbia

* Correspondence: nedeljko.prdic021@gmail.com (N.P.); ceca@fimek.edu.rs (S.I.)

Abstract: A competitive business environment pushes beekeepers to the creation of value at a higher level than the competition in a way that is difficult to imitate. In order to survive in a competitive business environment, beekeeping producers must direct their resources towards innovative solutions, which can include honey quality assurance programmes and further product development, as well as creation of value-added honey products that is translated in good business performance. As the potential of the Republic of Serbia's beekeeping production can be strengthened and its products exported beyond the national market, there is a need to examine the influence of a set of factors that can impact the beekeeper's business performance. Therefore, this paper will examine the direct and indirect influence of the competitive environment (the business environment opportunities, threats and the relationships with the consumers) and innovative performance (in the field of marketing, product design, product quality, distribution, manufacturing and time to market) on the business performance of Serbian beekeepers. This research uses the SEM method with the SmartPLS tool. The findings of the model have confirmed that a competitive environment and innovative performance have a direct positive, statistically significant impact on the business performance of Serbian beekeeping production. A weak indirect influence of a competitive environment on the business performance of beekeepers has been confirmed. The model has proven to be significant, and a high percentage of variations in beekeepers' business performance has been explained by the influence of two independent variables (competitive environment and innovative performance). As there is no previous research on the nexus of the competitive environment, innovative performance and business performance of Serbian beekeepers, these findings may be of special interest to authors and researchers, beekeeping organizations and representatives of agricultural advisory services.

Keywords: agriculture; honey; innovation; perceptions; beekeepers; Serbia



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1. Introduction

The contribution to beekeeping is of great importance in the process of achieving one of the most important goals of the Common Agricultural Policy. Beekeeping is a very important sector in European agriculture, as it generates an annual value-added of €1 billion. An overview of the honey market (2022) has shown that the number of beekeepers in the year 2020 in the EU is estimated at 615,000, with 19 million beehives. A majority of beehives in the EU are concentrated in Spain (15%), Romania (12%), Poland (10%), Greece (11%), France (9%) and Italy (8%). The Union contribution for 2020–2022 programmes is EUR 40 million/year, which represents an increase of 11% from the 2017–2019 programmes [1]. EU members are implementing various beekeeping support measures that are included in

the national programs of the member states [2] such as technical assistance for beekeepers and groups of beekeepers; varroasis control; rationalization of transhumance; supporting the laboratory that conducts physical-chemical analyses of honey properties; supporting the restoration of beehives in the community; and cooperation with specialized bodies. Article 55 (4) of the Regulation (EC) No. 1308/2013 [3] modifies the list of acceptable measures to support beekeeping, expands the scope and introduces two new measures: market monitoring and improving product quality with the aim of exploiting the product's potential on the market. The quality recognition of honey at the European Union level can be achieved by obtaining two designations: Protected Designation of Origin and Protected Geographical Indication; GI and the importance of the use of geographical indications for food products, especially honey, have been widely researched [4–10].

The honey production capacity in Serbia is satisfactory, so that after domestic needs are satisfied, there are still quantities that are placed on the foreign market. However, the beekeeping sector operates with problems, some of which have existed since the transition period. Production is a dominant supplementary activity [11] and beekeepers—although there is an umbrella association SPOS (Union of Beekeeping Organizations of Serbia) and SPOV (Union of Beekeeping Organizations of Vojvodina), as well as local associations—are largely unorganized and unprotected. Due to the fact that Serbia has the potential for the production of organic honey, the production of honey with a geographical indication, and the significant participation of the beekeeping sector in the export of the Republic of Serbia [12], there is a need for detailed research on all participants in this value chain.

The review of previous empirical research which has analysed the factors of beekeepers' production, has shown that there are important unexplored questions of beekeeper perceptions that should be looked at in more detail and investigated and examined in a comprehensive study. This created an opportunity for our research. There is a need to research beekeeping activity in terms such as customer satisfaction and loyalty, brand image, time to market, number of new products/services, capacity utilization, and innovation potential that could contribute to achieving more profitable business results. As there is no previous research on the nexus of the competitive environment, innovative performance and business performance of Serbian beekeepers, the results obtained in this research may be of special interest to authors and researchers, beekeeping organizations and representatives of agricultural advisory services.

The primary specific objective of this paper is to investigate the impact of business environment variables (such as the opportunities, threats, and relationships with the consumers) and the impact of innovative performance variables (such as marketing, product design, product quality, distribution, manufacturing and time to market) on the business performance of Serbian beekeepers. Based on a study of the relevant literature and the analysis of the results of the conducted research, the secondary specific objective is to develop a new approach by testing quantitative and qualitative factors, as well as a model that would determine the cause-and-effect relationships and connections of the key factors that determine business performance. In doing so, the paper will try to analyse this complex relationship through the perception of beekeepers, which is in line with the findings of Schouten [13], who states that the largest number of beekeeping studies use interviews or the survey as a tool for assessing the current state of beekeeping enterprises. Although several significant studies have been conducted in the area of different profitability factors of beekeeping enterprises [13–16], only a few studies have focused exclusively on this topic. While other authors have analysed the business performance of beekeepers from the aspect of profitability and liquidity [17–20], operational flexibility [17,18], innovation and modern business [18,21], yield per hive [22], tools, mechanization and organization and management of production [22–25], availability of financial resources [11,18,26], scientific organization of work and education and staff development [27], networking and intersectoral communication [18,28–31], there was a lack of beekeepers' perceptions of production performance in relation to the main competitors in terms of sales volume, profitability, growth rate of production and turnover, and reputation on the market.

To this end, we formulate the main research question: Can Serbian beekeepers, with their knowledge, abilities and opportunities, be enabled to respond to market needs with quality of services and products and technological innovations that can spur business performance? The main research question can be segmented into the following specific research questions: Does the competitive environment have a direct positive influence on the business performance of Serbian beekeeping activity and on innovation performance of Serbian beekeeping activity? Does innovation performance have a direct positive influence on the business performance of Serbian beekeeping activity? Does the competitive environment have an indirect positive influence on the business performance of Serbian beekeeping activity through innovation performance? The authors have formulated the hypotheses that are based on the research questions and are specified in the theoretical framework.

The main theoretical contribution of this paper is to contribute to the understanding of some related constructs which have not been investigated in the previous literature on the beekeeping sector. Hence, helping to develop a better understanding of the mechanism of impact of the beekeepers' perception of the competitive environment and innovation performance on business performance is our main theoretical contribution. In this regard, the findings of the paper will give an insight into the underlying mechanism by which the competitive environment and innovation performance influence business performance.

After the introduction, the conclusions of a number of authors, who have analysed the various aspects of the business environment, innovative performance and business performance in beekeeping production, and the theoretical framework will be presented. In the following sections, the authors will present the methodology, the research findings and its discussion. Finally, the concluding observations summarize the research findings. In particular, we emphasize that our findings can serve as a starting point for the creation of further strategies for the development of the beekeeping sector.

2. Literature Review

2.1. Competitive Environment

Beekeeping production has also been challenged by strong competition that arose as a result of the interaction of five forces: technological progress; globalization; deregulation and liberalization of the market for products and services, labour and capital; knowledge; and change [32]. The increase in competition also leads to more complex demands and needs of consumers, which conditions greater heterogeneity of products and services, improvement of performance, reduction of costs and shortening of the life cycle of products/services. In this business environment, beekeeping production has to adapt and implement innovations, according to the needs of the market, in order to survive, grow and develop [33]. This adaptation and changes are reflected in new approaches to customers and formulation of business strategies. According to Mustafa et al. [34], the adaptation to the market means investing and introducing new production processes or transforming production into a sustainable source of income for beekeepers [35]. At the same time, beekeeping transformation programmes should increase investments in the entire production chain of honey and honey products, in modernizing beekeeping styles [36].

A modern approach involves the participation of all relevant communities, organizations, academic communities and governments. For example, the beekeeping sector of Malaysia has the potential to improve the marketing aspects of honey, especially in the phase of promotion and adaptation to the specific requirements of the foreign market [34]. Ababor and Tekle [37] state that beekeepers have competitive knowledge, and the apiary market in Ethiopia has the potential to improve the quality and quantity of honey, research and consultancy, and has opportunities to improve marketing activities. Establishing links between food production (and, for example, honey) would contribute to the economic development of the district and even counteract population migration. Food products, such as honey, require little technological equipment for processing and are adequate in the promotion of rural tourism. Virgil and Simona [38] indicate the importance of establishing strong links between specialized micro-enterprises, tourist facilities,

restaurants or bars and local beekeepers in rural development, i.e., the development of beekeeping. Relationships with customers are a key strategic resource of producers [39]—beekeepers [40–42]. Digital marketing through the Internet or electronic devices should aim to enable better communication with users [43]. Special attention should be paid to the development of multifunctional products, with packaging design and size suitable for online sales channels [44,45].

Today, we have consumers who are well-informed and price-oriented, and who expect greater value and product quality [46,47] that is adapted to their specific needs [48]. Consumer brand loyalty is also positively influenced by different platforms and applications offered by a brand on social networks, as consumers are looking for creativity and variety from brands on social networks [49]. Customer relationship management aims at the satisfaction and loyalty of existing customers [50,51]. Consumer satisfaction is facilitated by frequent purchases and increased sales; accelerated market expansion and cash flow growth; attracting new consumers and faster conquest of new and expansion of existing markets; and using a premium pricing strategy [52]. Focusing on the loyalty of existing consumers, two-way communication, cooperation with consumers valuable to the company, and personalized marketing relationships lead to competitive success [53,54]. Developed loyalty is another way to combat honey counterfeiting. Education regarding the authenticity and traceability of honey helps consumers and policy makers to choose high-quality local honey and avoid counterfeit products. Such consumption and purchasing behaviour will discourage producers from adulterating honey [55].

Therefore, earlier studies dealt with issues of the business environment for the development of beekeeping. The question of how well beekeepers respond to changes in the business environment and customer demands [34–36,39–42] has been investigated, in addition to how much they are ready to apply more modern beekeeping styles or performance strategies [36,52], increase quality and quantity [37,48,55], to cooperate [38], to be informed and improve knowledge [46,47], improve the distribution network [44,45] and promotion [49], all with the aim of developing loyalty that directly affects the increase in turnover and thus the business performance of beekeepers. Regarding beekeeping production in the Republic of Serbia, these issues have been very closely researched. We will mention the studies by Mijajlović and Subić [56], who analysed the state of beekeeping production in Serbia through statistical indicators, legal frameworks and regulations in this area, and investments and incentive measures or regulations [57] that are implemented at the state level in order to improve production. A study by Marinković and Nedić [58] investigated costs and returns on small bee farms, based on field-collected data on the number of hives, type of product, volume of production per hive and value per unit of measurement. Several studies have been conducted in the field of beekeeping in the context of organic production [59], innovations [60] or regional development [61,62], and marketing and promotion of healthy lifestyles [63]. Based on the above, it can be concluded that there is a lack of research on the relationship between the competitive environment and the business performance of beekeeping in Serbia. In addition to the fact that there are no conclusions on this topic in the literature, it is necessary to add that there is also a lack of assessment of beekeepers' perceptions of these issues.

2.2. Innovation Performance

Due to the fact that food contributes to a positive gastronomic experience, as well as the increasingly pronounced preferences and demand for healthy food, honey producers should think about innovations for their products. Innovative approaches and designs are needed also in terms of packaging and labelling. Innovation is the creation of new combinations of new or existing knowledge, resources and equipment [64]. Innovation strategy has a significant impact on the development of innovative culture [65]. Today, innovation has been defined as the implementation of a new or significantly improved product, good or service; a new marketing method; or a new organizational method in business practices, workplace organization or external relations [66], while a business process innovation

is a new or improved business process for one or more business functions that differs significantly from the firm's previous business processes [67]. The new economy is an information society based on intellectual capital, creativity, innovation and knowledge [68]. Only those companies that know how to combine tangible and intangible [69] resources to work together with consumers/customers in unique and innovative ways have a future [70,71]. The success of companies rests on their ability to create a knowledge base and use it effectively [72–75]. Innovations are the result of the learning process [76–81]. Higher education is important for embracing value-added hive products due to new technology adoption [82]. Earlier research [11] has shown that beekeepers are often professionally trained through professional counselling and lectures.

The cooperative business model relies on cooperation and communication and is achieved through a combination of actions and procedures, mutual agreements and leadership [83]. An integrated system in beekeeping, formed on cooperative intersectoral principles, includes apiaries, agricultural enterprises and other economic branches which have an interest in the development of beekeeping. The purpose of such cooperation is not only the production, processing and sale of final beekeeping products, but also the development of new production processes and products [18]. Innovations in beekeeping range from increasing yields per hive, minimizing risks to beekeepers, comb management and bee feeding to various aspects of health and the family environment [84,85]. Pacheco and Ocaña [86] point out that beekeeping can be facilitated by digital components, and their repercussions should be observed in the social sphere as well. Although innovation in beekeeping can be applied in and analysed from different perspectives, technological innovation remains the dominant approach in the sector.

Research on innovation issues in beekeeping starts from the analysis of equipment [42], innovative business models [42,83,87,88], distribution and cooperation [18,83], and promotion and marketing performance [65], in the context of increasing yields [84,85]. Although innovation in beekeeping can be applied and analysed from different perspectives, technological innovation remains the dominant approach in the sector. Innovation in beekeeping in Serbia has been investigated from the aspect of organic production [59,89], the potential and motives for introducing innovations [60,89,90], investments in research and development of new technologies [82], production technology [91], and the impact of innovation on regional development [92]. However, the influence or conditionality of innovation and business performance of beekeeping is insufficiently researched. First of all, there is a lack of research that shows the relationship; secondly, there is also a lack of assessment of beekeepers' perceptions of the state of innovation of their production. It is the result of insufficient implementation of innovations, knowledge and experience in beekeeping due to limited financial resources, but also due to the extensive form of production in the Republic of Serbia. Due to the fact that beekeepers invest insufficiently in promotional activities [11], the assessment of innovation by consumers would not give a true assessment. This is exactly what imposed the need to deepen the research on this topic. Therefore, it is necessary to investigate innovative aspects of beekeeping in marketing, product design, product quality, in distribution, in production processes, and especially in relation to competitors, by assessing the perceptions of those parameters.

2.3. Business Performance

Tutuba et al. [42] state that modern beekeeping equipment, techniques, knowledge and skills contribute to improving productivity and product quality. Performance refers to quantifying the effectiveness and efficiency of past events [93]. From the perspective of the company, performance can be defined as the operational ability to satisfy the wishes of key stakeholders in the business of the company [94], or the ability of the company to realize set goals [95]. Some authors [96] point out that performance is not an absolute but a relative measure of success and refers to the degree of achievement of organizational goals. Performance management has been researched by many authors [97–101]. Some authors

point out that financial indicators such as profitability and liquidity are most important measures of sustainability and operational flexibility [17].

On the other hand, measuring non-financial performance is important because of “aligning company resources with the chosen strategy and improving the efficiency of business processes and activities” [102] (p. 491). The structure of the business model coordinates all these activities, and a well-structured business model ensures sustainability and profitability for beekeepers. In this context, an innovative business model is a prerequisite for the commercialization of beekeeping. Osterwalder and Pigneur [103] point to revenue streams and cost structure, and Chesbrough [88] refers to segmentation and customer relationships. They conclude that knowledge of resources and good relations with partners play an important role in building a successful business model for beekeepers. Distribution is very important for the further development of the local market in agricultural products [104]. The role of innovation in the distribution of honey and beekeeping products is important for business and a successful business model. The company’s positioning strategy, based on innovative marketing activities, contributes to the integration of beekeepers into the business environment. However, Amit and Zott [87] point out that a business model is conceptually different from an organizational structure, a product positioning strategy in the market or a value chain [105].

Regarding the business performance of beekeepers, Djurabaev [18] points to factors that affect profitability such as the application of innovations in the field of beekeeping, various tools, mechanization and organization of production, and migration during beekeeping help to increase the strength of bee colonies and thus significantly increase the amount of honey produced [22]. The volume of production, i.e., the size of the apiary, contributes to economic efficiency, due to the possibility of applying the mechanization of the technological process or modern management of beekeeping [24]. Djurabaev [18] points out that on a large farm, due to a large volume of production, it is financially possible to use various tools, which would reduce manual work and make the work of beekeepers easier, allowing to keep zoo-technical and veterinary services on the farm.

Regarding beekeeping production in the Republic of Serbia, the performance of beekeeping production has been analysed through statistical indicators [11,56], profit [58], quality of honey and honey products [55,59,89], innovation [60] and production technologies [91]. Based on the above, it can be concluded that there is a lack of research on the relationship between the competitive environment and innovation and its effect on the business performance of beekeeping in Serbia. There is a lack of research that will measure this relationship, which would analyse perceptual scores of the dependent and independent variables. In addition to the fact that there are no conclusions on this topic in the literature, it should be pointed out that the method of structural equations using the method of partial least squares has not been used in the research on the influence of selected variables on the business performance of beekeeping. The above-mentioned shortcomings in the literature have imposed the need to start researching these influences, that is, to look at the performance of beekeepers from a different angle, which represents the contribution of this study and fills the literature gap.

2.4. Theoretical Framework

In recent years, the global honey market has shown a steady increase in demand. As Pocol, Ignjatijević and Cavicchioli [106] state, the key functions of beekeeping are food security, ecological function, economic function and socio-cultural function. It is a fact that producers in Serbia achieve different yields, that they produce in different conditions, that the socio-demographic characteristics of producers are very different, as well as that state support measures for the beekeeping sector are limited or not used at all. In recent years, more and more young beekeepers have been engaged in beekeeping; that is, beekeeping is a place for employment of the unemployed as well as a source of additional income. In such business environment, beekeepers are engaged in production as well as administrative and promotional work, regardless of qualification and age structure. As the potential of Serbia’s

beekeeping sector can be strengthened and its products exported beyond the national market, there is a need to examine the influence of a set of factors on the performance of beekeeping production. The Serbian beekeeping sector is characterized by low use of PCs and the Internet and modest investments in human potential, while investments are made in the physical potential of production. In the conditions of the dilapidated local road network, the general problem is the transportation of bees from one location to another. Due to the lack of expertise, equipment and material resources, individual producers pay little attention to activities such as packaging, labeling, promotion, etc. Some of the producers are not informed and are not aware that the accompanying activities contribute to increasing income and recognition on the market. Beekeepers mostly lack financial resources and professional knowledge. The lack of funds [11,26] for the implementation of innovations has a limiting effect on productivity, minimization of losses, increase in profits and profitability of production [18–20]. In these conditions, beekeepers sell their products on the domestic market and are not able to directly market their products on the international market [12]. Although honey from Serbia is of high quality, it is not adequately recognized on the international market. The number of beehives is increasing, so that the average number of beehives in the period 2001–2013 was 305.46 thousand with 4173.77 tons of honey produced [11], and in 2021, there are 976 thousand beehives and 7438 tons of honey [107]. Honey production can continue to exist as a traditional one, or it can develop and modernize, i.e., innovate. Therefore, our research team has developed a research model that is shown in Figure 1.

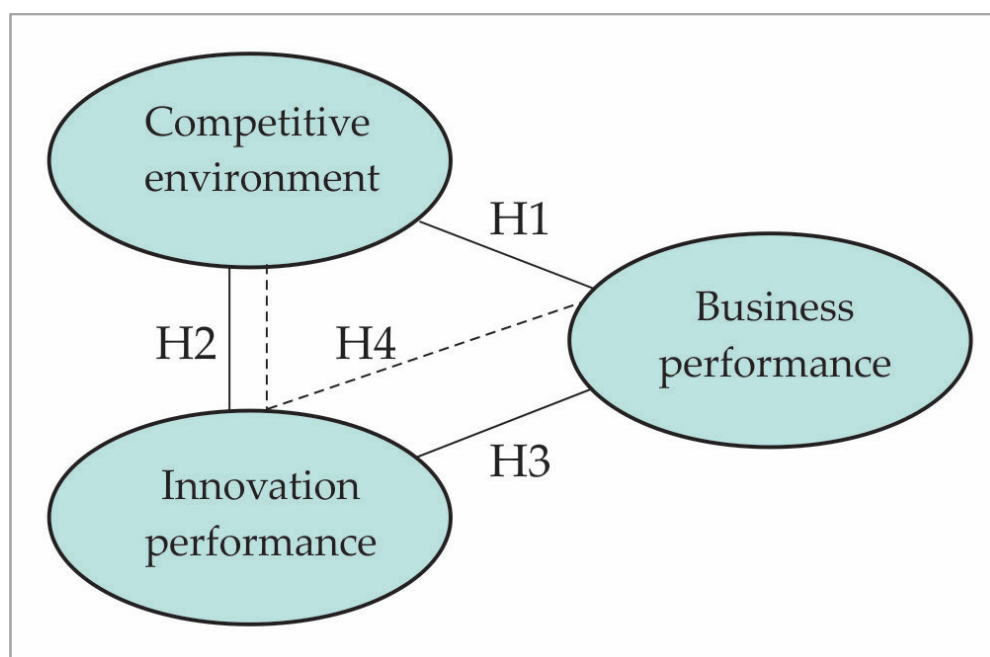


Figure 1. A hypothetical model relating competitive environment, innovation performance and business performance.

Hypothesis 1 (H1): *A competitive environment has a direct positive influence on the business performance of Serbian beekeeping activity.*

Hypothesis 2 (H2): *A competitive environment has a direct positive influence on the innovation performance of Serbian beekeeping activity.*

Hypothesis 3 (H3): *Innovation performance has a direct positive influence on the business performance of Serbian beekeeping activity.*

Hypothesis 4 (H4): *A competitive environment has an indirect positive influence on the business performance of Serbian beekeeping activity through the innovation performance.*

3. Materials and Methods

In order to achieve the defined goals of the research, that is, the information needed for a specific research action, the research process in this work includes a theoretical and empirical part. The authors wanted to analyse the relation between the variables of the competitive apiculture sector environment, business performance and innovation performance. The research questionnaire was modelled on previous research, whereby the competitive environment was represented as business environment opportunities (C1, C2) and threats (CE5) and relationships with the consumers (C3, C4). Innovation performance was represented by the respondent's subjective assessment of the innovativeness in the fields of marketing (IP1), product design (IP2), product quality (IP3), distribution process (IP4), manufacturing process (IP5) and time of product placement on the market (IP6). Business performance was operationalized as current and future sales volume (BP1), profitability (BP2), sales volume (BP3), growth rate (BP4) and reputation (BP5), as compared to the main competitors [108]. In order to standardize and clarify the measurement instruments, to reduce the margin for error and to contribute to the reliability of the research, the assessments of respected experts in the given fields of the proposed indicators confirmed that the survey items are relevant and follow a logical layout.

Ethical considerations were also incorporated into the research. The prerequisite of voluntary participation in the research was met for all the participants. All the participants in the research were informed about the nature of the research and how the results would be used. The anonymous survey was carried out in electronic form, and the principle of confidentiality was respected. The random selection method was used for the selection of a representative sample. After pretesting the survey with the relevant subject experts and survey methodologists and creating a final version, the questionnaire was sent to 1050 e-mail addresses of beekeepers (about 3% of SPOS members) from the Republic of Serbia, based on the available database of the Association of Beekeepers of Serbia and Vojvodina (SPOS and SPOV), in which all beekeepers are registered. According to SPOS data, 237 associations and about 30 thousand beekeepers are registered (there is no record of active or fictitiously registered beekeepers), so the sample represents about 2.8% of registered beekeepers. Therefore, the survey was conducted on the territory of the Republic of Serbia from March to May 2022. Of the 1050 questionnaires, distributed in electronic form by distributing the link of the electronic questionnaire via e-mail, 839 were returned completed in full and usable (response rate of 80%), and the final sample consisted of 839 respondents. In line with the research questions, the evaluation of subjective judgments of the respondents was performed using seven-point Likert scales, ranging from strongly disagree (1) to strongly agree (5).

Appropriate methods of statistical analysis were used. The data were firstly processed in the SPSS statistical package. Data analysis was further carried out using the method of structural equations, using the method of partial least squares—PLS-SEM (partial least squares-structural equation modelling) using PLS SMART software. The method of partial least squares is a linear regression method that is used in situations where one wants to examine the regression influence of complex sets of data. The mentioned model is effective for analysis in situations where there are large numbers of independent and several dependent variables, when the variables do not have a normal distribution [109,110], when the data are burdened with intercorrelation and the like [111]. In researching the impact of the competitive environment and innovative performance on the business performance of Serbian beekeeping activities, the PLS-SEM model consists of a measurement of an external model, where there are manifest variables of a formative and reflective character. The reflective model consists of 11 variables, while the formative model consists of the latent variable, business performance, with 5 formative variables that affect the latent construct

BP. In the process of data analysis, the size of the research sample has been firstly assessed. The sample size is satisfactory, which is in accordance with the recommendation of Barclay et al. [112]. Although the PLS-SEM model does not require a normal data distribution [112], the normality of the data distribution was examined using the Kolmogorov–Smirnov test and the Shapiro–Wilk test to assess the normality of the distribution of the results. The reliability of the data measures, which are the manifest variables of the latent constructs, was tested using Cronbach’s alpha [109].

4. Results

The final sample, as shown in Table 1, consisted of 839 beekeepers, of whom 7.03% were female while the majority 92.97% was male. On average, 38.02% of beekeepers were aged over 41 years, and the majority of beekeepers owned 10–25 (40.64%) beehives, while 43.87% owned more than 25 beehives. In the entire sample, 87.25% of beekeepers have completed high school (or vocational education institutes) and 12.75% have completed college or higher education institutions. The majority of respondents (87.6%) engage in nonprofessional beekeeping. The majority of the respondents (56.26%) live in large households (with four and more than four household members).

Table 1. Socio-demographic structure of the sample.

Gender			Beekeepers Engagement		
	Frequency	Percent		Frequency	Percent
Male	780	92.97	Professional	104	12.4
Female	59	7.03	Non-professional	735	87.6
Number of family members			Age		
2	220	26.22	26–40	255	30.40
3	147	17.52	41–55	319	38.02
4	448	53.40	>55	265	31.58
More than 4	24	2.86			
Number of bee hives			Education		
<10	106	12.63	High school	543	64.72
>100	24	2.86	Vocational education	189	22.53
10–25	341	40.64	Higher education	107	12.75
26–50	183	21.82	Total	839	100
51–100	185	22.05			

The mean scores of the characteristics of the competitive environment, innovation performance and business performance are shown in Table 2. The beekeepers are of the opinion that their competitive environment (CE—mean score of 3.17) does not give much impediment to the further development of beekeeping. The Serbian beekeepers consider that the beekeeping sector is rich in investment and marketing opportunities (mean score of 3.18), and consumer trends and desires are easy to forecast (mean score of 3.30). The bargaining power, satisfaction and loyalty of their buyers has a strong influence on the business results (mean score of 3.06). The claim regarding the number of the counterfeit honey products achieved the highest mean score of 3.43. Because of the low consumer purchasing power in the Serbian market, the cheaper counterfeits and substitutes for honey may appeal more to consumers, as the buyers are price-sensitive. This constitutes a major threat.

Table 2. Perceived characteristics of the competitive environment, innovation performance and business performance.

Competitive Environment		Mean	Innovation Performance		Mean	Business Performance		Mean
CE1	The beekeeping sector business environment is safe and provides little threat for the survival and well-being of my beekeeping activity	2.90	IP1	How innovative would you consider your beekeeping activity to be in marketing	2.97	BP1	I expect the sales volume of my current products in the coming three years to strongly decrease (1) to strongly increase (5)	3.42
CE2	The beekeeping sector is rich in investment and marketing opportunities	3.18	IP2	How innovative would you consider your beekeeping activity to be in product design	2.84	BP2	Compared to my main competitors my profitability is very low (1) to very high (5)	3.20
CE3	Consumer trends and desires are easy to forecast	3.30	IP3	How innovative would you consider your beekeeping activity to be in product quality	2.88	BP3	Compared to my main competitors my sales volume is very low (1) to very high (5)	2.88
CE4	The bargaining power, satisfaction and loyalty of my buyers has a strong influence on my business results	3.06	IP4	How innovative would you consider your beekeeping activity to be in distribution process	2.97	BP4	Compared to my main competitors my growth rate is very low (1) to very high (5)	2.92
CE5	The number of counterfeit honeys on the market is large	3.43	IP5	How innovative would you consider your beekeeping activity to be in manufacturing processes	2.89	BP5	My beekeeping activity distinguishes me positively from my competitors by good reputation in the market	2.99
			IP6	My products enter the market faster compared to my main competitors' products	2.95			

The beekeepers have rated the innovation performance with an average score of 2.91, which is slightly lower than the mean score of the competitive environment, while the perceived innovation in the marketing and distribution process (mean score of 2.97) has achieved the highest score. The beekeepers are satisfied with their “time to market” (mean score of 2.95). The claims regarding innovativeness in the manufacturing processes, product quality and product design have also achieved a rather high score (mean scores of 2.89, 2.88 and 2.84, respectively).

The beekeepers' assessment of their business performance (BP—mean score of 3.02) indicates that, compared to their main competitors, the beekeepers perceive their sales volume (mean score of 2.88) and growth rate (mean score of 2.92) to be lower but have a positive belief that the profitability is rather high (mean score of 3.20), compared to their main competitors, and that the sales volume (mean score of 3.42) of their current products in the coming three years will increase. They perceive themselves to be distinguished from their competitors by having a good reputation on the market, which is extremely important for successful product differentiation (mean score of 2.99).

Reflective model assessment findings show that 11 variables make up the reflective measurement model (Table 3). Factor loads for all manifest variables are in the range of 0.778–0.874. The values of Cronbach's α (the values are 0.888, 0.892) indicate a high level of reliability. The values of composite reliability (CR) are 0.894 and 0.903, confirming that the selected variables represent characteristics of innovation performance and competitive environment constructs. Convergent validity (AVE) values are 0.641 and 0.691 (the criterion is satisfied, since the value is greater than 0.5).

Table 3. Presentation of values of standardized factor loads and results of the reflective measurement model.

	Reflective Measurement Model—Outer Loadings	Path Coefficients	Cronbach α	CR	AVE
IP	How innovative would you consider your beekeeping activity to be in marketing IP1	0.779	0.892	0.903	0.641
	How innovative would you consider your beekeeping activity to be in product design IP2	0.835			
	How innovative would you consider your beekeeping activity to be in product quality IP3	0.787			
	How innovative would you consider your beekeeping activity to be in distribution IP4	0.797			
	How innovative would you consider your beekeeping activity to be in manufacturing processes IP5	0.820			
	My products enter the market faster compared to my main competitors' products IP6	0.806			
CE	The beekeeping sector business environment is safe and provides little threat for the survival and well-being of my beekeeping activity CE1	0.778	0.888	0.894	0.691
	The beekeeping sector is rich in investment and marketing opportunities CE2	0.866			
	Consumer trends and desires are easy to forecast CE3	0.833			
	The bargaining power, satisfaction and loyalty of my buyers has a strong influence on my business results CE4	0.874			
	The number of counterfeit honeys on the market is large CE5	0.801			

Discriminant validity shows to what extent the constructs empirically differ from the constructs in the structural model [109,113]. The analysis was performed using Fornell–Larcker criteria and HTMT values. Standardized factor loads of latent constructs are higher than cross-standardized factor loads of other constructs, which satisfies the criterion and confirms the discriminant validity of individual latent constructs (Table 4).

Table 4. Discriminant validity—Fornell–Larcker Criterion.

	Characteristics of Innovation Performance	Competitive Environment	Heterotrait–Monotrait Ratio (HTMT)
Characteristics of innovation performance	0.804		Competitive environment -> Characteristics of innovation performance 0.835
Competitive environment	0.780	0.831	

Results of collinearity research (VIF) for the outer and inner models are shown in Table 5. Values for reflective variables range from 1.798 to 2.829; the obtained values are less than 3, which confirms the fact that there is no problem of collinearity in the model.

Table 5. Values of the collinearity (VIF).

Outer Model	VIF	Outer Model	VIF	Inner Model	
BP1	1.958	CE4	2.551	Business performance	Characteristics of innovation performance
BP2	2.691	CE5	2.359	Characteristics of innovation performance	2.551
BP3	2.456	IP1	1.985	Competitive environment	2.551
BP4	2.395	IP2	2.369		1.000
BP5	2.050	IP3	2.462		
CE1	1.798	IP4	2.768		
CE2	2.829	IP5	2.767		
CE3	2.209	IP6	2.079		

The formative model consists of the latent variable, business performance, with five formative variables that affect the latent construct BP. The results of the reliability analysis of the formative latent construct are in the range of 1958–2691. The obtained values are less than 3; therefore the criterion [109] is satisfied, and we can conclude that formative measurement variables do not have the problem of collinearity.

The findings on the statistical significance of outer weights of the formative measurement variables are shown in Table 6. The findings indicate the existence of the total effect of the constructs.

Table 6. Statistical analysis of formative measurement variables.

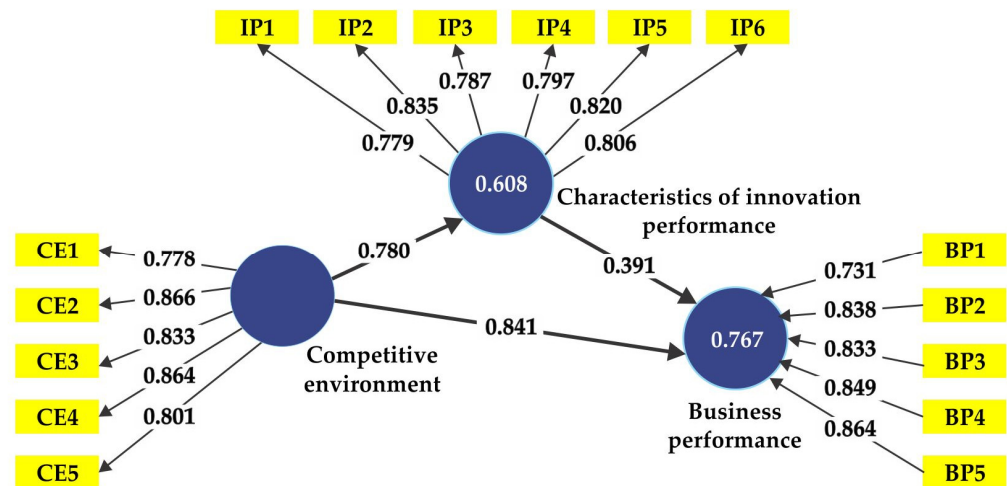
	Outer Weights	Standard Deviation	T-Value	p-Value
BP1 -> Business performance	0.124	0.024	5.053	0.000
BP2 -> Business performance	0.182	0.035	5.184	0.000
BP3 -> Business performance	0.252	0.030	8.377	0.000
BP4 -> Business performance	0.251	0.035	7.166	0.000
BP5 -> Business performance	0.386	0.026	14.882	0.000

Finally, testing of the significance of the structural model and confirmation of hypotheses was performed (Table 7). There is a positive connection between innovation performance, indicating that positive and statistically significant associations between the variables and four hypotheses (H1, H2, H3 and H4) have been confirmed.

Table 7. Results of hypothesis testing using the PLS-SEM technique.

	β Original Sample (O)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	p Values	Confidence Interval 2.5–97.5%		Hypothesis Confirmation
Competitive environment -> Business performance	0.841	0.012	67.419	0.000	0.816	0.865	+
Innovation performance -> Business performance	0.391	0.036	10.965	0.000	0.319	0.460	+
Competitive environment -> Innovation performance	0.780	0.012	64.528	0.000	0.755	0.802	+
Competitive environment -> Innovation performance -> Business performance	0.305	0.028	10.951	0.000	0.250	0.360	+

The graphical presentation of the model results (Figure 2) shows the values of the corrected coefficient of determination (R^2 adjusted) for innovation performance $R^2 = 0.608$, indicating that 60.8% of the innovation performance is explained by the predictor variable, competitive environment; $R^2 = 0.767$ for business performance, which indicates a high influence, and that 76.7% of business performance has been explained by the innovation performance and competitive environment.

**Figure 2.** The graphical presentation of the model results.

5. Discussion

In our context, we depict a new theoretical approach and examine the research gap that is unexploited and insufficiently exploited by other scholars, as this study is one of the first to focus on the links between the perceptions of business performance, competitive environment opportunities and threats and innovative performance in beekeeping production in the Republic of Serbia. To this end, we provide new information enriching existing theory with new scientific knowledge about the impact of beekeepers' perceptions on the competitive environment and the characteristics of innovation performance on business

performance. Thus, this study makes an important contribution to the literature from the approach that made it possible to look at beekeepers' performance from a different angle, that is, on the basis of qualitative perceptual experiences, which expands and fills the literature gap. On the other hand, the paper adds value to existing knowledge by creating new research that has direct implications for all stakeholders in the beekeeping sector and can contribute to using the full potential of Serbian beekeepers to satisfy domestic and foreign demand.

The findings show that Serbian beekeepers consider the competitive environment safe and without much impediment to the further development of beekeeping. However, the bargaining power, loyalty and satisfaction of their buyers has a strong influence on the business results. The counterfeit honey products constitute a major threat because of the low consumer purchasing power in the Serbian market and the cheaper substitutes for honey, which may appeal more to consumers. The findings on the perceived innovation in the marketing and distribution process, the manufacturing processes, product quality and product design findings show that Serbian beekeepers consider their innovation performance satisfactory. The perceived profitability compared to their main competitors is high, with hopes that the sales volume of their current products in the coming three years will increase. They perceive themselves to be distinguished from their competitors by having a good reputation on the market, which brings us to the conclusion that the consumers can be further educated on the benefits of quality honey products. Branding programs that promote local honey products, with protected geographical indication, or organic honey products, produced within the province, may be a part of economic development strategies for rural communities. This is only possible if the local honey producers are positioned differently from other large honey producers and if the local honey products have adequate support and promotion in the framework of a rural strategy.

The findings have supported the hypothesis that the competitive environment has a direct positive influence on the business performance of Serbian beekeeping activity (H1), as in the model, the strongest connection exists between Competitive Environment (CE) and Business Performance (0.841). This finding is only partially consistent with the earlier research on the importance of CE on the business performance of beekeepers [114]. In fact, research has shown that the characteristics of the adoption of new technologies in beekeeping has a more significant impact on business performance compared to CE. We can also conclude that the strength of the relationship in the current research is more pronounced. Therefore, we can conclude that the competitive environment has a very strong positive impact on the business performance of beekeepers, which can result in expanding production, conquering new markets [52] and attracting new customers. Clear differentiation from honey counterfeits on the market can be achieved through education [27,55,106], informing consumers on the quality of honey [115]. It is also necessary to monitor changes in consumption and trends in customer perception [116–118].

Thanks to a stable environment, the honey sector has the potential for employment [119,120], especially women's employment [114], increasing income [121], improving living standards and the environment [25,89,122], thus contributing to overall rural development [37,123–126]. Many authors point out the importance of social entrepreneurship [120], rural development [37,123–126], environmental environment [25,89] and beekeeping tourism [122], in line with Mustafa et al. [34] and Ababor and Tekle [37], who indicate that the beekeeping sector has this development potential. The perceived importance of attributes, such as care for the environment and nutritional properties, has proven to have a positive influence on the consumers' WTP for local honey [127]. Beekeepers should start from monitoring consumer needs [34,46–48,118,128], which emphasizes the importance of market research and consumer behaviour. On the basis of perceived consumer preferences, product differentiation strategies and marketing activities can be adequately created, which is confirmed by the high values of factor loadings for CE2, and is in line with the research findings of Ignjatijević et al. [114] and Tretrapetch et al. [129]. On the other hand, the consumer trends (CE3) represent a guideline in which direction to

modernize production [21,22,34,36,44,45], organize the production process [23,42,103], network [28,30] and cooperate with professional and scientific organizations [11,29,31,38,90]. Customer satisfaction and loyalty is one of the most important factors (CE4) that directly affects the business performance of beekeepers and is in accordance with the previous findings [40–42,54]. Consumer satisfaction is a prerequisite for regular consumption [50,51] and profit [18–20,35,84,85]. Thus, consumer satisfaction with honey and honey products and developed loyalty are an effective means of combating unfair competition and counterfeiting.

A strong connection also exists between the competitive environment and innovation performance (H2—0.780) and between innovation performance and business performance (H3—0.391). Although adapting supply to market demands requires knowledge and investment [34,36], there are problems for the adoption of innovations by small producers in countries in transition. A higher degree of education and professional beekeeping experience presuppose a willingness to invest in research and development [82]. However, in developing countries, the access to financial resources is limited [11,20,26,60], and systemic problems [89,90] and mimicry of innovation are present [130]. Technologies proposed are often incompatible with indigenous values, habits and socio-cultural institutions [131] and need to adapt to market characteristics [34,37,116,117]. Moerland [132] argues that a system of protecting geographical indications allows and stimulates innovation; it supports the development and integration of places, people and products, i.e., it has an ecological, economic and social effect [7,8]. In the case of honey, with geographical origin, quality is not questioned [11,106,133]. For example, in the Republic of Serbia “Fruška Gora linden honey” has received the label of geographic origin, thanks to the support of EU funds in the process of certification. Findings on the attitudes of honey consumers [44–47] show that consumers prefer quality and show loyalty to producers who offer certified honey [55,118,128,133].

The total indirect effect of the competitive environment on the business performance through innovation performance (H4) is 0.305. These results are in line with the previous research, which points out that the competitive environment can directly and indirectly contribute to the business performance of beekeepers. Modern lifestyles impose the need to manage knowledge [72,74,75] and innovations in order to adapt beekeepers to the specific needs of consumers [48,89,114,118], be it packaging, distribution or promotion [44,45]. By increasing beekeepers’ awareness of innovations, in terms of quality, design [132], modern equipment, organization and business management [24,25,42], income and cost management [18–20,22,88,128], beekeepers will have a positive impact on their business results, which is confirmed by the findings. To develop more innovative processes or products, which are predominantly incremental in nature, beekeepers should have a clear business orientation [65,83], strengthen their relationships with agro-food industry institutes and various organizations [31], and integrate innovative sustainable technological solutions that are important drivers of innovation [134].

The use of a systematic approach to management [25] and professional organization of work are also factors that can increase the economic efficiency of beekeeping production. The profitability of the business, and thus the competitiveness of the apiary, is also affected by the development of the staff [27], who, together with seasonal workers [58], procure raw materials, and finalize and prepare beekeeping products for distribution. Accordingly, it is important to point out that beekeepers will achieve better economic results due to better organization of production [23] and a larger workforce. Modern bee farms [21], with a high degree of mechanization and organization of production, friendlier to the environment [122], can operate as the most profitable bee farms if they represent an integrated system of production and processing of bee products and raw materials, communicating intersectorally [31], providing the consumers with finished products. Djurabaev [18,28] states that the creation of cooperatives or clusters is one of the models for creating an industrial base, using the potential of the territory and increasing the competitiveness and productivity of the food sector in the region [119]. Clusters ensure the integration of scientifically based and technologically feasible recommendations of an innovative nature

and the creation of a business climate [29]. Organizations integrated in a cluster can use the services of intermediary organizations, and the results depend on the strength of vertical and horizontal cooperation, integrated production, consumer, procurement, credit, supply and marketing and other types of cooperatives [28,30].

6. Conclusions

In the analysis of the research questions, we can conclude that the answer to the research questions must be based on individual assessments and a quantitative evaluation of the perception of individual production indicators. Thus, a qualitative assessment of the production of the beekeeping sector has been obtained. Therefore, in order to look at the state of the beekeeping sector, we commenced our research from the views of individuals and derived a generalized conclusion. Our analysis started from the perceptions of the beekeepers on micro aspects of production and environment. In this way, an answer has been obtained on whether the beekeepers have the knowledge and the experience, that is, whether they are capable of dealing with competition; whether they recognize the needs of the market, and if the products and services they provide satisfy their expectations (expected business performance), as well as consumer expectations; and whether they adequately use potential and opportunities. The answers of beekeepers are especially important to us on the issues of innovations in production: whether they are present at all, that is, whether they are a stimulus or a limiting factor. What has been crystallized during the research, as a significant constatation? Production indicators of the beekeeping sector indicate an increase in the number of registered beekeepers and hives and an increase in production, but what does that say about the challenges of a beekeeper, for whom beekeeping is a supplementary activity or hobby, who produces in a very rural environment, in an extremely extensive mode? What does it say about a beekeeper who has a scientifically expert approach and uses all the services of advisory services? The question that has guided us since the beginning of the research is who can better assess the state of the sector than the producers themselves?

Nevertheless, the research started from the conclusions of earlier research that there is insufficient implementation of innovations, knowledge and experience in beekeeping, that the sector lacks financial resources, and that insufficient investment is made in research, marketing, promotion, design, quality and product distribution. The research evaluated the attitude of beekeepers on the relationship between the environment and innovations and its impacts on business performance, which was lacking in beekeeping studies in Serbia. The research confirmed all the hypotheses. The strongest positive statistically significant influence exists in relation to the competitive environment on the business performance, followed by a somewhat weaker but positive and statistically significant influence of the competitive environment on the innovative performance of beekeepers. We also confirmed the positive impact of the innovative performance on the business performance of beekeepers. Finally, the weakest but positive statistically significant indirect influence of the competitive environment, through innovations, on beekeeper performance has been established. The research has shown that the set model is significant, and a high percentage of variations in the beekeepers' performance is explained by the influence of two independent variables (competitive environment and innovative performance).

Therefore, we started from the conclusions of previous research, developed the model, and drew conclusions that represent strategic and unique guidelines on beekeepers' current perceptions. In order to survive on the market, beekeeping producers must maintain the competitive advantage, with resources directed towards innovative solutions. With scarce financial resources, they should focus on the relationships with existing and new consumers, and link with other stakeholders in the value chain, while nurturing the organizational culture that is the basis for innovation. The survival of the beekeeping producers in the long term is determined by their ability and willingness to create long-term value. This can be achieved not only by complete knowledge of one's own business, but also by knowledge of the market, continuous monitoring of all changes and rapid adaptation to new market

requirements. The competitive business environment ensures the creation of value at a higher level than the competition in a way that is difficult to imitate, that is, the creation of value that exceeds consumer expectations. The competitive business environment spurs innovations, which are often accompanied by further product development, organic and certified honey and value-added honey products.

The findings could support the development of new strategic actions towards more systemic innovation. For long-term growth, cooperation between all stakeholders is necessary. First of all, the beekeeping sector of the Republic of Serbia should increase competitiveness by introduction of additional funds for beekeeping support by the government, in line with modern EU measures, in order to reach compliance with the standards and rules of good agricultural practice in beekeeping. The market regulation mechanisms should be more efficient, while the rural development policy should encourage the measures directed towards adaption/creation of innovation processes, as well as the improvement of competitiveness, sectoral integration, innovation, market orientation and entrepreneurship. Incentive measures to support the development of beekeeping will undoubtedly have an impact on the long-term sustainable development of beekeeping as well as on the improvement of the innovative and competitive potential of the agricultural and food sector. Entrepreneurial initiative, innovation and motivation of beekeepers can be enhanced through knowledge transfer and information measures, development of advisory services, services for assistance to beekeeping societies, quality honey programs, establishing organizations of honey producers, and others forms of cooperation, which fall under measures of rural development. An important indicator of the successful adoption and implementation of European Union standards and values is the degree of acceptance of support schemes for agriculture and rural development in new and potential EU member states [135].

This research study is based only on a representative sample of beekeepers in the Republic of Serbia; therefore, its findings cannot be generalized to a wider range of developed honey markets. This limitation of the study can point to the need to undertake further studies in comparable economies at a similar stage of apiculture development.

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