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# MANAGING EMPLOYEE PERFORMANCE IN THE AGRICULTURAL SECTOR: IMPORTANCE OF HUMAN CAPITAL DEVELOPMENT

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## ABSTRACT

Contemporary business conditions, the global food crisis, and the post-epidemic recession have led agricultural firms to reconsider human capital's role in the overall business. Previous research points to the problem of low efficiency in the use of resources in the agricultural sector when it comes to investment and development of human capital. The aim of the study is to analyze the contribution of human capital to employee performance in agricultural firms in Serbia. Human capital is observed through human capital efficiency (HCE). Employee performance is observed through value-added per employee, net profit per employee, operating revenue per employee, and labor productivity. VAIC methodology for calculating HCE was applied in the paper. The sample includes 177 active agricultural firms that operated in Serbia in 2021. Based on the results, it can be concluded that HCE positively contributes to the observed employee performance, except in the case of value-added per employee.

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## Introduction

In the conditions of rapid population growth and post-epidemic recession, the agricultural sector is becoming an increasingly important economic branch at the global level, since the global food crisis is becoming increasingly apparent. Due to the increasing role of human resources in agriculture, as well as the efforts of firms to improve operations and respond to the challenges of global competition, agricultural firms should take care of

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regular investment in education and expertise, and the development of employees in order to acquire modern knowledge and competences (Dimovski et al., 2022). The need for additional investment in human resources of agricultural firms becomes justified, taking into account scarce natural resources as well as demographic and technological changes (Dimovski et al., 2022). Bearing in mind the stated reasons for investing in the human capital of agricultural firms, the authors of Hadelan et al. (2022) emphasize that agricultural firms provide a significant contribution to employability and job creation, thus contributing to local rural employment and providing a social, cultural and environmental contribution to the sustainability of rural areas.

The agricultural sector in Serbia resisted the challenges of the political and economic crisis, continuously contributing to the good economic results of the country (Žarevac Bošković et al., 2022; Dimovski et al., 2022). Improving the competence of human resources is particularly important in order for the agricultural sector of Serbia to increase its participation in the international market, especially the EU market (Dimovski et al., 2022). Based on STAT.YEARB.SERB data (2022), employment in the agriculture, forestry, and fishing sector in Serbia shows a tendency to decrease from 2019 to 2021. Based on the same source, it can be concluded that the number of employees in 2021 compared to 2011 decreased by 14%. The average net salary in 2021 increased by 7.04% (STAT.YEARB.SERB. 2022:87). The sector of agriculture, forestry, and fishing participated with 6.3% in the value of the gross domestic product, which is a 0.3% higher share compared to 2019 (STAT.YEARB.SERB. 2022:147).

One of the factors that influence the development of agricultural firms are effective human resources policies (Ryazanova, 2019). Investing in the development of human capital increases the value of knowledge workers and their productivity (Pulić, 2004). However, research shows that the majority of women and men who work in agricultural firms have very little education (Gupta et al., 2023). In addition, human capital programs in the small business sector have traditionally been viewed as quite expensive, which limits their use (Klaas et al., 2010). Liu et al. (2022) emphasize as a special problem of the agricultural sector is that agricultural production struggles with the low efficiency of the used resources. Therefore, the aim of the study is to analyze the contribution of human capital to employee performance in agricultural firms in Serbia. Human capital will be analyzed through human capital efficiency (HCE).

A review of the literature revealed a couple of research gaps. First, most studies analyze the macro-production environment of agricultural firms (Liu et al., 2022) and do not deal with the micro factors and resources used within the firm. The authors of Gupta et al. (2023) note that academic research about agri-food systems often ignores what happens between the farm and the final consumer and focuses too much on consumers. Therefore, there is a need to analyze the role of human capital, as a micro factor of business, in agricultural firms. Second, previous studies analyzed the importance of human capital in the agricultural sector through effective human resources policies (Ryazanova, 2019); training and development of employees (Pansuwong et al., 2023); formal and informal education (Dimovski et al., 2022). However, previous studies did

not analyze the efficiency of the use of human capital through HCE in the agricultural sector. By analyzing HCE firms monitor how capable they are of creating value through the efficient use of human capital (Pulić, 2004). Third, previous studies have analyzed the relationship between human capital and the competitiveness of agricultural firms (Dimovski et al., 2022); human capital and growth of firms (Pansy Wong et al., 2023); human resource management and motivation in agriculture (Ilic et al., 2022). Vukoje et al. (2022) consider that future research should be based on the analysis of the financial performance of agricultural firms and farms, as well as the analysis of available capacities as the main drivers of the agricultural sector. Bearing in mind the observed research gaps, this study focuses on the analysis of HCE in agricultural firms and its impact on employee results i.e. employee performance.

According to the observed problem of the agricultural sector as well as observed research gaps, the study aims to answer the following research questions:

1. How efficiently do agricultural firms in Serbia use available human capital?
2. Is there an impact of HCE on employee performance in agricultural firms?

## Literature review

### *The role of human capital in agricultural firms*

Human capital represents the value of accumulated knowledge and skills of employees, which are significant for the success and survival of the firm (Pansuwong et al., 2023). Nguyen-Anh et al. (2022) consider human capital as a profitable input that indicates a firm's ability to acquire new information, skills, and technology. Modern business conditions and the demands of the competitive environment lead to the fact that workers in agricultural firms must continuously acquire new knowledge, skills, and abilities in order to respond to greater market demand and keep up with the development of technology and science (Dimovski et al., 2022). Numerous theoretical and practical studies classify human capital as the main driving forces and key determinants of the competitiveness of agricultural firms that contribute to the improvement of business through the continuous acquisition of knowledge and skills of employees in these firms (Nguyen-Anh et al., 2022; Dimovski et al., 2022). For this reason, it can be said that the development of human capital can guarantee the sustainability and stability of agriculture firms in unstable environmental conditions. Investing in human capital helps these firms to outperform competitors, quickly take on new tasks, and perform various innovative jobs (Nguyen-Anh et al., 2022) through the exchange of knowledge between employees and coordination of all management levels of the hierarchy (Ryazanova, 2019).

The importance of human capital for agricultural firms can be explained on the basis of the theory of human capital and the resource-based view. According to human capital theory, individuals possess skills, abilities, and knowledge that provide economic value to an firm (Slavković, Ognjanović, 2018). The same theory suggests that management's

decision to invest in human capital is based on monitoring and comparing potential future benefits with the cost of human capital (Ming Chen, Jun Lin, 2004). Another theoretical approach that supports the development of human capital in agricultural firms is the resource-based view, according to which key skills essential for competitive advantage can be acquired from internal development, within the firm itself, in this case, employees (Ming Chen, Jun Lin, 2004).

Garavan et al. (2001) believe that investing in the development of human resources is necessary for several reasons: to build and maintain human resources in the future and to keep those resources in the present. The same authors state four key attributes of human capital that must be considered when managing this capital: flexibility and adaptability, improvement of individual competencies, development of organizational competencies, and individual employability (Garavan et al., 2001). Slavković and Ognjanović (2018) point out that a particularly important characteristic of human capital is that it is not owned by the firm, since the knowledge, skills, and know-how of employees can not be separated from the individual. Therefore, leaving the firm, temporarily or permanently, implies that the firm remains without a part of its human capital (Slavković, Ognjanović, 2018).

Research shows that the use of human capital affects the efficiency of the firm (Nkambule et al., 2022). Rahimpour et al. (2020) point out that with the help of human capital, a firm can increase the efficiency and effectiveness of the use of all other resources and thus the competitive advantage of agricultural firms. Xia et al. (2020) believe that the increase in the number of employees is one of the key factors affecting the utilization and protection of agricultural land. Literature proves that human capital is one of the key factors in the profitability of agricultural firms (Gloy et al., 2002; Ming Chen, Jun Lin, 2004; Vukoje et al., 2022; Buallay, 2022). Bearing in mind the mentioned benefits of the use of human capital as well as its impact on the profitability of agricultural firms, there is a need to analyze the efficiency of its use and its impact on the results of agricultural firms.

### *Human capital and employee performance*

Employees are a significant asset of any firm whose business success or failure can be attributed to the employees' performance (Rahimpour et al., 2020). Employee performance represents the results of employees' work, that is, the level of efficiency and effectiveness that employees achieve while performing assigned activities and tasks (Ahmad et al., 2015). By analyzing the employee performance management of agricultural firms, it monitors the overall efficiency and productivity of organizational processes, the results of employees at the level of each functional unit, and also the results at the organizational level (Ahmad et al., 2015). Employee performance is the result of the behavior and attitudes of the employees, their commitment and understanding of the assigned tasks, as well as adherence to the standards they need to meet (Silva et al., 2022).

The approach of employees to the performance of business tasks affects their work

results as well as overall business results. Employee performance depends on the efficiency of the use of available resources by employees. Effective performance of business tasks is conditioned by investment in human capital, i.e. in the knowledge, skills and abilities of employees. For this reason, it is necessary to look at how efficiently agricultural firms use human capital (HCE) and how this efficiency is reflected in the level of employee performance.

Labor productivity is often used as an indicator of employee performance in the literature. Productivity is mainly determined by the level of production factors in the country (land, capital, natural and human resources) but also by the efficiency of their use (Dimovski et al., 2022). Productivity growth in agricultural firms can be increased by strengthening production capacities or by improving the technical equipment of agricultural holdings (Hadelan et al., 2022), as well as formal environmental regulations and environmental non-governmental organizations (Liu et al., 2022). Rada and Fuglie (2019) link the level of productivity and the size of the farm, where they conclude that higher productivity is achieved on a smaller farm. Improvement of productivity and more efficient use of resources in agricultural firms can be achieved through the training and development of employees, as shown in previous studies (Yang, Chen, 2019; Pansuwong et al., 2023). Through the training and development of employees, their motivation is increased, productivity and profits are increased, but it also absorbs more workforce by increasing investment in human capital and improving the labor proficiency of employees (Yang, Chen, 2019). In previous studies, other indicators of employee performance (value-added per employee, net profit per employee, operating revenue per employee) were not the subject of analysis. Given that previous studies indicate the importance of improving productivity for the business of agricultural firms, it is necessary to investigate the influence of the efficiency of the use of human capital on other employee performance. The following research hypotheses were established:

*H<sub>1</sub>: Human capital efficiency contributes to value-added per employee in agricultural firms.*

*H<sub>2</sub>: Human capital efficiency contributes to net profit per employee in agricultural firms.*

*H<sub>3</sub>: Human capital efficiency contributes to operating revenue per employee in agricultural firms.*

*H<sub>4</sub>: Human capital efficiency contributes to labor productivity in agricultural firms.*

## **Materials and methods**

### **Sample and data collection**

Analysis of the relationship between HCE and employee performance using a sample of active firms in the Serbian agriculture sector. The necessary data on active agricultural firms were collected on the basis of the database available on the website of the Ministry of Finance of the Republic of Serbia, Treasury Administration. Podaci za obračun nezavisne i zavisnih varijabli prikupljeni su iz baze Serbian Business Registers Agency.

From the total number of active firms, those for which no financial data were available were eliminated. The sample was reduced to 177 agricultural firms, and financial data were collected for the year 2021. The structure of the observed sample is given in Table 1.

**Table 1.** Sample descriptives

<b>The legal form of the firms</b>	<b>Number</b>	<b>%</b>
Agricultural cooperative	50	28.2
Entrepreneur	4	2.3
A limited liability company	116	65.5
Stock company	6	3.4
Limited partnership	1	0.6
<b>Σ</b>	<b>177</b>	<b>100</b>
<b>Firms size</b>	<b>Number</b>	<b>%</b>
Micro	101	57.1
Small	47	26.6
Medium	24	13.6
A large firms	5	2.8
<b>Σ</b>	<b>177</b>	<b>100</b>
<b>Number of employees</b>	<b>Number</b>	<b>%</b>
up to 9 employees	110	62.1
10-49	43	24.3
50 – 149	19	10.7
150 and more	5	2.8
<b>Σ</b>	<b>177</b>	<b>100</b>

*Source:* Author's calculation

The sample is dominated by agricultural firms of the legal form Limited Liability Company (65.5%), and micro-sized firms (57.1%) that employ up to 9 workers (62.1%).

## Methodology

By applying the VAIC methodology, the value of HCE is calculated, which indicates how efficiently the firm uses human resources. Firms aim to increase the effective utilization of human capital because this will ensure higher value creation for the firm (Hasnaoui, Hasnaoui, 2022). The VAIC methodology was established by Pulić (2004). The methodology is based on the calculation of value-added, as an objective indicator of business success, and shows the firm's ability to create value on the basis of „the investment in resources including salaries and interests on financial assets, dividends to the investors, taxes to the state and investment in future development“ (Pulić, 2004:64). Value added can be calculated as follows (Pulić, 2004):

$$VA = OP + EC + D + A \quad (1)$$

OP = Operating; EC = Employee costs; D = Depreciation; A = Amortization.

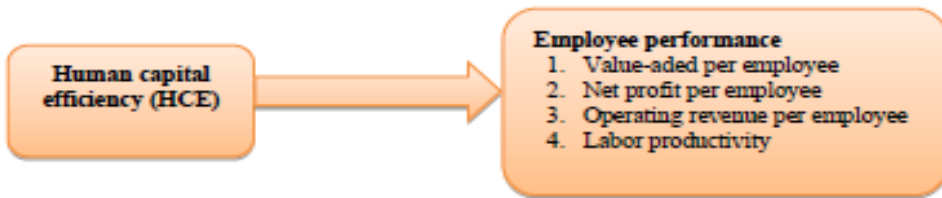
Human capital efficiency is calculated as follows (Pulić, 2004):

$$HCE = VA/HC \quad (2)$$

HCE = Human capital efficiency; VA = Value added and HC = total salaries and wages of the firm.

The research model is shown in Figure 1. The independent variable is HCE. The values for calculating HCE are taken from the financial reports of observed agricultural firms. Financial reports are available in the database of the Serbian Business Registers Agency.

**Figure 1.** Research model



Source: Authors

The advantages of using the VAIC methodology are reflected in the available quantitative data for the calculation of HCE in financial statements that are public. Second, VAIC methodology provides a standardized and consistent measure, given that it does not use subjective measures obtained from questionnaires. Thirdly, the calculation of the HCE coefficient is suitable for comparison with previous years, but also between firms from the same or different economic activities (Bayraktaroglu et al., 2019).

The dependent variables in the paper are:

*Value added per employee* shows the added value created by one employee. It is calculated by dividing the value-added value and the number of employees in agricultural firms (Bontis et al., 2018; Ognjanović, Pešterac, 2019).

*Net profit per employee* shows how much net profit value is created per employee. It represents the ratio of net profit value and the total number of employees (Chen et al., 2008; Ni et al., 2021).

*Operating revenue per employee* shows the value of operating revenue created by one employee. It is calculated as a ratio of operating revenue value and the total number of employees (Ni et al., 2021).

*Labor productivity* represents the ratio of profit before tax to the number of employees (Ognjanović, Slavković, 2022). It indicates the contribution of each employee to the creation of profit before tax.

## Statistical methods

Data processing and testing of research hypotheses was performed using the statistical package for social sciences IBM SPSS Statistics, Version 23. A confidence interval  $\alpha = 0.05$  was used to determine statistical significance. The paper uses descriptive statistics, correlation analysis and regression analysis in order to test research hypotheses.

## Results

### Descriptive statistics

Using descriptive analysis, the mean of observed variables, standard deviation, kurtosis, and skewness for observed variables are determined (Tabela 2). The mean value of HCE for observed agricultural firms is 7.64. If the dependent variables are observed, Operating profit per employee has the highest mean 848.62. The standard deviation records the highest value in the case of Labor productivity. By looking at the kurtosis values for all variables, it can be concluded that they are positive, which means that the distribution is sharper than normal. By looking at the skewness values, it can be concluded that the values of HCE, Value added per employee, and Operating revenue per employee are positioned to the left of the arithmetic mean, i.e. closer to lower values. In the case of the variables Net profit per employee and Labor productivity, most values are positioned closer to higher values.

**Table 2.** Descriptive statistics

Variables	Mean	St. Deviation	Kurtosis		Skewness	
			Statistics	St. Error	Statistics	St. Error
HCE	7.64	43.25	153.63	0.36	12.06	0.18
Value added per employee	34.24	122.19	59.03	0.36	7.35	0.18
Net profit per employee	379.35	3284.51	19.49	0.36	-0.82	0.18
Operating revenue per employee	848.62	3311.06	23.80	0.36	3.69	0.18
Labor productivity	498.34	3478.89	19.47	0.36	-0.12	0.18

*Source:* Author's calculation

Testing research hypotheses involves determining the normality of the distribution. As the observed sample includes 177 agricultural firms, the Kolmogorov-Smirnov test is used to check the normality of the distribution. based on the value of this test, it can be concluded that the normality of the distribution has not been proven, since for all observed variables the Kolmogorov-Smirnov test  $> 0.05$ .

### Correlation analysis

Correlation analysis is carried out using Spearman's rho coefficient, whose value indicates the direction and strength of the relationship between the observed variables. The strength of the correlation is determined by the value of the correlation coefficient. Values of this coefficient from 0.10 to 0.29 indicate weekly correlation, values from 0.30 to 0.49 indicate moderately correlation, while values greater than 0.50 indicate strong correlation between variables (Pallant, 2016). Depending on whether Spearman's rho coefficient has a positive or negative value, the direction of the correlation is determined. The results of the correlation analysis are shown in Table 3.



**Table 3.** Correlation analysis

Variables	HCE	Value added per employee	Net profit per employee	Operating revenue per employee	Labor productivity
HCE	1				
Value added per employee	0.118	1			
Net profit per employee	0.688**	0.189*	1		
Operating revenue per employee	0.837**	0.217**	0.810**	1	
Labor productivity	0.702**	0.184*	0.996**	0.825**	1
* Correlation is statistically significant on the level of 0.050					
** Correlation is statistically significant on the level of 0.000					

Source: Author's research

Looking at Table 3, HCE achieves a positive, strong, and statistically significant correlation with employee performance, except in the case of value-added per employee. The strongest correlation is present between HCE and operating revenue per employee ( $\rho = 0.837$ ;  $p = 0.000$ ). If the correlation between the dependent variables is observed, the strongest correlation is between labor productivity and net profit per employee ( $\rho = 0.996$ ;  $p = 0.000$ ), while the weakest correlation was identified between value-added per employee and labor productivity ( $\rho = 0.184$ ;  $p = 0.012$ ). Otherwise, the variable value-added per employee leaves a weak but statistically significant correlation with other employee performance.

### Regression analysis

The impact of HCE on employee performance is determined using a simple regression analysis. The application of this analysis implies the fulfillment of certain assumptions: multicollinearity and autocorrelation. Multicollinearity indicates a high degree of correlation between variables. A high value of multicollinearity hinders the implementation of regression analysis. That is why the recommended value of the VIF coefficient (which monitors multicollinearity) is up to 10 (Field, 2009). Autocorrelation is monitored based on the Durbin-Watson coefficient. If the value of this coefficient is  $< 4$ , the regression analysis is justified. All observed models met the minimum conditions of multicollinearity and autocorrelation.

Model 1 analyzes the relationship between HCE and value-added per employee. Based on the data shown in Table 4, it can be concluded that hypothesis  $H_1$  is rejected ( $p = 0.662$ ), i.e. HCE does not contribute to value-added per employee. The coefficient of determination  $R^2$  is 0.033, which means that 3.3% of the variability of value-added per employee is explained by the regression model, while the rest is influenced by other factors.

**Table 4.** Model 1 – HCE and Value-added per employee

Variables		Standard regression model		
Dependent	Independent	$\beta$	t-value	Sig.
Value-added per employee	HCE	-0.033	-0.438	0.662
<i>Dependent variables: Value-added per employee</i> <i>Significant: ** <math>p \leq 0.01</math>; * <math>p \leq 0.05</math></i> <i>DW = 2.008</i> <i><math>R^2 = 0.033</math></i> <i>F = 0.192</i> <i>p = 0.662</i>				

Source: Author's calculation

Model 2 analyzes the relationship between HCE and Net profit per employee. The information in Table 5 shows that HCE contributes positively to net profit per employee, that is, hypothesis **H<sub>2</sub> is accepted** ( $p = 0.000$ ). The coefficient of determination  $R^2$  is 0.234, which means that 23.4% of the variability of net profit per employee is explained by the regression model, while the rest is influenced by other factors. The value of Adjusted R Square is 0.230. The value of the  $\beta$  coefficient is 0.484, which means that an increase in HCE by 1 unit of standard deviation leads to an increase in net profit per employee by 0.484 units of standard deviation.

**Table 5.** Model 2 – HCE and Net profit per employee

Variables		Standard regression model		
Dependent	Independent	$\beta$	t-value	Sig.
Net profit per employee	HCE	0.484	7.319	0.000
<i>Dependent variables: Net profit per employee</i> <i>Significant: ** <math>p \leq 0.01</math>; * <math>p \leq 0.05</math></i> <i>DW = 2.033</i> <i><math>R^2 = 0.234</math></i> <i>F = 53.568</i> <i>p = 0.00</i>				

Source: Author's calculation

**Hypothesis H<sub>3</sub> is accepted**, that is, HCE contributes positively to operating revenue per employee ( $p = 0.000$ ).

**Tabela 6.** Model 3 – HCE and Operating revenue per employee

Variables		Standard regression model		
Dependent	Independent	$\beta$	t-value	Sig.
Operating revenue per employee	HCE	0.518	8.011	0.000
<i>Dependent variables: Operating revenue per employee</i> <i>Significant: ** <math>p \leq 0.01</math>; * <math>p \leq 0.05</math></i> <i>DW = 2.101</i> <i><math>R^2 = 0.264</math></i> <i>F = 64.170</i> <i>p = 0.00</i>				

Source: Author's calculation

Based on the value of the coefficient of determination  $R^2$ , it can be concluded that 26.4% of the variability of operating revenue per employee is explained by the regression model, while the rest is influenced by other factors. Growth of HCE by 1 unit of standard deviation leads to growth of operating revenue per employee by 0.518 units of standard deviation.

**Table 7.** Model 4 – HCE and Labor productivity

Variables		Standard regression model		
Dependent	Independent	$\beta$	t-value	Sig.
Labor productivity	HCE	0.528	8.233	0.000
<i>Dependent variables: Labour productivity</i> <i>Significant: ** <math>p \leq 0.01</math>; * <math>p \leq 0.05</math></i> <i>DW = 2.034</i> <i><math>R^2 = 0.279</math></i> <i>F = 67.790</i> <i>p = 0.00</i>				

Source: Author's calculation

The results of Model 4 show that HCE has a positive effect on labor productivity, that is, hypothesis **H<sub>4</sub> is accepted** ( $p = 0.000$ ) (Table 7). The coefficient of determination  $R^2$  is 0.279, while the value of Adjusted R Square is 0.275. The value of the  $\beta$  coefficient is 0.528, which means that an increase in HCE by 1 unit of standard deviation leads to an increase in labor productivity by 0.528 units of standard deviation.

### Discussion and implication

The results of the study show that HCE contributes positively and statistically significantly to net profit per employee, operating profit per employee, and labor productivity. The impact of HCE on value-added per employee has not been proven. By testing the research hypotheses, answers to the research questions were found. First, based on the results of descriptive statistics and regression analysis, it can be concluded that agricultural firms use their human capital efficiently. This means that the observed agricultural firms achieve a higher marginal revenue from investment in human resources development compared to the marginal cost (Buallay et al., 2021). Additional improvement in efficiency can be achieved by investing in modern technology and material equipment. Second, the impact of HCE was confirmed on the observed employee performance of agricultural firms, except in the case of value added per employee. The increase in the efficiency of the use of human capital leads to the improvement of the results of the employees' work. On the other hand, the relatively high return on human capital in rural non-farm business firms becomes attractive for individuals who are considering returning to the countryside and becoming entrepreneurs (Liu, 2011).

The importance of human capital in creating the satisfactory performance of agricultural firms was proven by the authors (Gloy et al., 2002; Ming Chen, Jun Lin, 2004; Vukoje et al., 2022). High productivity and results of employees' work are achieved by the best

use of employees' abilities and on the basis of achieving cost efficiency (Ognjanović et al., 2022). Kengatharan (2019) concludes that employees with significant human capital contribute to a high level of productivity through reduced input and increased use of resources, which affects lower production costs. Such results are in line with the theory of human capital and resource-based view, according to which investment in human resources leads to the creation of economic value for the firm and the acquisition of a sustainable competitive advantage. The strategy of developing and using human capital can be considered one of the most important strategies that a firm follows in order to achieve success. For the above reasons, the costs incurred by investing in human capital should be viewed as inputs, while the creative ideas of employees are outputs, i.e. returns on investments (Mansour et al., 2014).

Modern business conditions lead to human capital becoming the dominant resource for creating satisfactory business results through satisfactory employee performance, even in traditional industries such as agriculture. High-quality human capital leads to solving business problems and bottlenecks that ensure production efficiency and thus increase organizational efficiency (Kengatharan, 2019). Therefore, in agricultural firms with superior human capital, employees perform various tasks in a more creative way, show appropriate behavior at the workplace, perform business tasks efficiently and go the extra mile beyond the roles specified in the job description (Kengatharan, 2019).

Improving the efficiency of the use of human capital as well as the performance of agricultural firms can be achieved through various human resource management practices. Ahmad et al. (2015) recommend that the growth of employee performance can be achieved by investing in monetary benefits, training programs, non-monetary benefits, organizational support, organizational support for career development, supervisory support, and capacity-building programs. Liu et al. (2022) consider that high-quality human capital can promote and encourage R&D in green technologies, provide technical and knowledge support for activities and management of agricultural land, and is therefore an essential source of economic growth for agricultural firms. The research results are consistent with the conclusion (Mehreen, Ali, 2022) that improving employee performance requires the promotion of a learning and development culture in order to achieve sustainable competitive advantage.

### **Practical implication**

The results of the research indicate that the efficiency of the use of human capital affects the observed employee performance, except for value added per employee in agricultural firms in Serbia. Considering the level of development of the agricultural sector in Serbia, farm managers and owners would have to invest more funds in equipment and physical assets in order to improve the efficiency of the use of human capital. Human capital gains value by using the knowledge, skills, and abilities of employees over equipment and other material and financial assets. By using modern equipment, the efficiency of the use of human capital would increase, and thus the results of the employees' work would be at a higher level, which would increase the value-added per employee.

The drop in employment in the agricultural sector of Serbia was highlighted as a special research problem. This result is partly a consequence of the introduction of modern technologies, but it is also a consequence of worse working conditions. That is why farm owners must create better conditions for the work of employees, first of all by introducing modern equipment, so that employment grows and thus the volume of business. In addition to technical equipment, owners must also take care of providing various types of benefits to employees in order to improve the image of the business. By recognizing the agricultural sector as an attractive branch of the economy on the labor market, agricultural firms will direct further business development and enter new markets, since the need for food is constantly growing at the global level.

Owners must look at the reason for poor value added per employee results. The reason for such results can be insufficient innovative practices as well as a lack of creative ideas in the business of these firms. Innovation can be achieved in all fields, from business organization to the communication and delivery of agricultural products to the consumer. Therefore, farm owners should provide such working conditions that will encourage employees to innovate in all areas of business and support them in more creative work.

### **Limitation of research**

The first limitation is of a methodological nature and refers to the HCE calculation procedure. Salaries of employees, compensation for employees, taxes, and contributions are shown as the only cost, i.e. investment in human capital. The financial reports do not specifically show items related to investment in employee training, training, non-material rewards, etc. Therefore, it appears that part of the value of human capital is not reported, resulting in an underreported HCE value compared to the real one. However, for all observed firms, the income statement did not show additional investments in human capital, so for all firms, HCE was calculated according to the same criteria.

The second limitation refers to the availability of data. Financial reports were not available for a certain number of agricultural firms, which limited the number of observed units in the sample. According to the data of the Ministry of Finance of the Republic of Serbia, Treasury Administration, the number of agricultural firms is 1200. The observed sample makes up 14.75% of the population.

### **The direction of future research**

Future research could be based on the inclusion of additional variables of employee performance of agricultural firms as well as indicators of profitability, financial structure, and market performance. Also, it is possible to extend the analysis to other components of intellectual capital, applying the VAIC methodology. Future research could test the moderating influence of material assets on the relationship between HCE and the performance of agricultural firms. The idea for future researchers may be that it is necessary to investigate which benefits for employees contribute the most to the growth of employee performance.

## Conflict of interest

The authors declare no conflict of interest.

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