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Article

Economic Profit of Family Farms in the Republic of Serbia

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Abstract: The paper aims to assess and evaluate the achieved level of economic profit of different types of farming in the Republic of Serbia. The research focuses on Family farms that were part of the FADN sample in 2022. Economic profit, unlike entrepreneurial income, accounts for the opportunity costs of factors of production (labor, capital, and land) in its calculation, making it a highly suitable indicator of the business success of family farms. The research results indicate that more intensive farms, which also had the highest asset turnover ratios, achieved the highest economic profit. It refers to farms engaged in horticulture and granivores farms. On the contrary, farms engaged in livestock production, such as grazing livestock and milk production, experienced very low economic profits or even economic losses. It primarily concerns small farms with a standard output value below 25,000 euros, mostly located in the areas with natural constraints in Central Serbia. For this reason, agricultural policymakers should focus on economically empowering by encouraging associations, adopting a more restrictive approach to agricultural product imports, ensuring timely payment of government support, and implementing other similar measures.

Keywords: *Economic profit; opportunity costs; family farms; FADN; Republic of Serbia.*

1. Introduction

Economic sustainability in agriculture cannot be unambiguously defined. There are multiple definitions, with authors generally agreeing that the economic sustainability of agricultural holdings is conditioned by the rational management of available production factors. The difference lies in the calculation, i.e., in defining the threshold of economic sustainability. The most commonly used indicators for assessing economic sustainability are profitability, liquidity, stability, and productivity [1]. The first three groups of indicators are based on financial reports, which is also their main drawback [2]. Financial reports provide insights exclusively into the accounting perspective of the achieved financial result.

Accounting profit is a crucial indicator of business performance for economic entities. However, the majority of entities in agriculture are family farms [3], which do not maintain double-entry bookkeeping and are not required to submit full financial reports (Balance Sheet, Income Statement, Cash Flow Statement, etc.). For this reason, family farms do not calculate accounting profit based on the balance method (Income Statement scheme) but rather entrepreneurial profit as the difference between realized revenues and actual (explicit) costs of the farm. Radivojević [4] emphasizes that the risk of achieving entrepreneurial profit is very high because it is not as stable as interest and rent but rather represents a reward for the successful engagement of the entrepreneur. Therefore, for an entrepreneur—or in this case, a farm—to be successful, innovation, creativity, and flexibility of the farm holder are necessary.

Entrepreneurial profit does not account for implicit costs, i.e., the opportunity costs of own production factors, which are highly significant for family farms. Family farms primarily rely on their labor, capital, and land [5], which are also the three most important production factors in agriculture. Therefore, including the opportunity costs of own production factors in the calculation is of particular importance for determining the "real" profit of an agricultural holding. Economic profit is a business performance indicator that specifically includes the opportunity costs of own production factors in the calculation [6], allowing for a realistic assessment of the achieved level of economic sustainability of agricultural holdings.

The subject of this study is the production and economic indicators of agricultural holdings in the Republic of Serbia. The main objective of the research is to assess and evaluate the achieved level of economic profit across different types of farms. The paper is structured as follows: first, an overview of the materials and research methods used is provided, followed by the presentation of research results in the form of an analysis of both entrepreneurial and economic profit for all farms, with a particular focus on small farms. Finally, relevant conclusions are drawn, and potential solutions for improving the current situation are proposed.

2. Materials and Methods

The research is based on accounting data from family farms in the Republic of Serbia. It includes 1,758 family farms that were part of the FADN sample in 2022. Given the applied FADN sample methodology, the results can be validly extrapolated to the entire population. This was achieved by applying appropriate weighting factors, ensuring that the obtained results represent weighted averages for the entire farm population.

For analysis, farms were classified into eight groups according to the official EU classification (European Commission, 2022): (1) Arable farming – RAT, (2) Horticulture and vegetable production – HOP, (3) Viticulture – VIN, (4) Fruit growing – VOĆ, (5) Dairy production – MLP, (6) Grazing livestock – STP, (7) Pig and poultry farming – SVŽ, (8) Mixed crop and livestock production – MEŠ.

Based on economic size criteria, farms were further divided into six groups according to the official EU classification [7] (Table 1). The research focuses on farms belonging to the first and second economic size classes, i.e., those with a standard output value ranging from €4,000 to €25,000.

Table 1. Official EU division into six classes of economic size.

Economic size class	Standard output value
[1]	2.000 ≤ X < 8.000 €
[2]	8.000 ≤ X < 25.000 €
[3]	25.000 ≤ X < 50.000 €
[4]	50.000 ≤ X < 100.000 €
[5]	100.000 ≤ X < 500.000 €
[6]	X ≥ 500.000 €

The study also applied a regional criterion for the spatial analysis of the achieved results of family farms. For this purpose, the Republic of Serbia was divided into the following four regions, according to the Regulation on the Nomenclature of Statistical Territorial Units (NSTJ 2): (1) Belgrade Region, (2) Vojvodina Region, (3) Šumadija and Western Serbia Region and (4) Southern and Eastern Serbia Region.

For this study, farms from Belgrade, Šumadija, Western Serbia, and Southern and Eastern Serbia regions were analyzed together within the group of farms classified as Central Serbia.

Entrepreneurial profit (EnP) can be calculated by subtracting the balance of subsidies and taxes on investments (BSTI) from the net farm income (NFI). Based on the FADN system indicators, the formula for calculating entrepreneurial profit is as follows:

$$EnP = NFI - BSTI, \quad (1)$$

Economic profit (EcP) is calculated by subtracting the value of implicit, i.e., total opportunity costs (TOpC), from the entrepreneurial profit (EP). The formula for calculating economic profit is as follows:

$$EcP = EP - TOpC, \quad (2)$$

Total opportunity costs are calculated as the sum of the opportunity costs of labor (OpL), the opportunity costs of capital excluding land (OpC), and the opportunity costs of land (OpLnd), as follows:

$$TOpC = OpL + OpC + OpLnd, \quad (3)$$

The opportunity costs of labor are evaluated based on the reference wage that unpaid labor could earn if engaged in other occupations instead of working on the farm. The formula for calculating the opportunity costs of labor is as follows:

$$OpL = RW \times UL, \quad (4)$$

Where:

RW – Reference wage in the municipality where the farm is registered / average gross wage per hour of work;

UL – Utilization of unpaid labor on the farm expressed in working hours.

The opportunity costs of capital (excluding land) are expressed based on a reference annual return rate on own capital of 5% [8, 9, 10]. The formula for calculating OpC is as follows:

$$OpC = (\text{Own capital} - \text{Land}) \times 5\%, \quad (5)$$

The opportunity costs of land can be evaluated together with the opportunity costs of capital [11, 12, 13] or separately [14, 15, 16].

In this study, these costs are calculated separately to achieve greater accuracy in the calculation. The opportunity costs of land are evaluated based on the average annual land rent in the municipality or district. The procedure for calculating the average land rent is as follows:

- First, the land rental costs for farms that have leased land are related to the area of utilized agricultural land (UAL) under lease using the following formula:

$$\text{Land rent} = \text{Land lease costs (€)}/\text{UAL in lease (ha)} \quad (6)$$

- After determining the land rent per farm, the average land rent value is calculated at the municipality/district level where the observed farms are registered.

Finally, for each farm, the area of owned land is multiplied by the average annual land rent in the municipality where it is registered to determine the opportunity costs of owned land. If the average land rent cannot be determined for a specific municipality (e.g., due to the absence of farms with leased land in that municipality), the average land rent for the corresponding administrative district is used. The final formula for calculating the opportunity costs of land is as follows:

$$\text{OpLnd} = \text{Owned land (ha)} \times \text{Average land rent in the municipality/district (€/ha)} \quad (7)$$

The value indicators in the study are presented in euros, using the average exchange rate during the year, as regularly published by the National Bank of Serbia (NBS) [17].

3. Results and Discussion

Entrepreneurial or accounting profit is an indicator of a business entity's performance and is derived from the difference between realized revenues and actual incurred costs. It is an accounting category of results that has its limitations, particularly in family farms, as previously mentioned. However, entrepreneurial profit is the starting indicator for analyzing the business performance of agricultural holdings in this study.

Based on the obtained results, we can state that all types of agricultural holdings in Serbia achieve relatively high values for the observed indicator (Table 2). One of the main drawbacks of this indicator is that, on its own, it does not allow for an accurate determination of the achieved level of success of the observed entities. To address this shortcoming, the economic profit indicator is introduced into the analysis, providing a more realistic assessment of the actual state of agricultural holdings.

Table 2. Entrepreneurial and economic profit of agricultural farms in the Republic of Serbia (in €).

Production type	All farms		Small farms	
	EnP	EcP	EnP	EcP
RAT	15,319	916	11,082	-2,190
HOP	36,395	19,336	28,905	12,122
VIN	14,930	-3,341	13,971	-7,958
VOĆ	17,062	3,243	16,147	2,576
MLP	18,930	1,157	15,525	-1,529
STP	16,916	155	10,278	-4,994
SVŽ	35,060	18,746	23,444	9,560
MEŠ	18,667	2,686	16,267	926
Cumulative average	18,028	2,501	14,527	-184

The situation is significantly different when analyzing the economic profit of agricultural holdings. Since family farms are the dominant type of business entity in agriculture in Serbia, economic profit represents a far superior indicator of business performance. These farms predominantly rely on their production factors, which are fully accounted for only when calculating economic profit.

Economic profit is a more precise performance indicator because, unlike entrepreneurial profit, it includes opportunity costs of owned production factors. As a result, the values of economic profit are significantly lower than entrepreneurial profit across all types of agricultural holdings. Only farms specialized in horticulture and vegetable production (HOP) and pig and poultry farming (SVŽ) achieve a notably good average economic profit (Table 2). These are highly intensive production types with shorter production cycles compared to other types. This leads to a relatively high asset turnover ratio [18], enabling farms to generate substantial revenues from production and achieve highly favorable business performance indicators [19, 20].

In Serbia, however, small farms—defined as those with a standard output value between 4,000 and 25,000 euros—are the most numerous. These farms account for approximately 90% of the total number of commercial agricultural holdings in Serbia (www.stat.gov.rs), underscoring their immense importance for agriculture. The business performance indicators of small farms are, as expected, considerably weaker. While average entrepreneurial profit appears relatively favorable across all production types, the average economic profit is often very low or even negative (Table 2). Overall, small farms in Serbia face a highly unfavorable situation, with an average economic loss of 184 euros. This is expected, as small farms generally have a lower capacity to survive and develop compared to larger farms [12]. As Vapa Tankosić et al [21] stated the agricultural sector is struggling with several challenges, such as the lack of basic market information for agricultural products and inputs, together with the decline in real income of the population, which hinders the potential of the sector. Only HOP and SVŽ farms stand out, achieving an average economic profit of 12,122 euros and 9,560 euros, respectively.

Farms in the Vojvodina region achieve an average economic profit of 5,707 euros, significantly higher than the 1,493 euros recorded by farms in Central Serbia. The Vojvodina region is definitively at a higher level of agricultural development due to its highly favorable natural conditions, substantial human resources, advanced technical and technological capacities, and other resources necessary for agricultural development [22]. When observed by production type, results in Vojvodina are generally superior, except in the case of SVŽ and HOP farms (Figure 1).

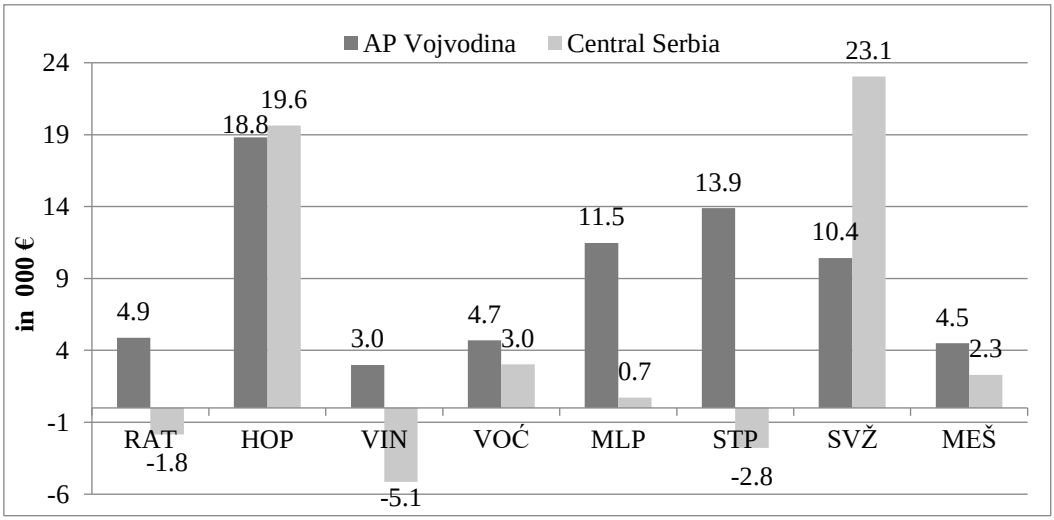

Figure 1. Economic profit of agricultural holdings by region.

These farms are also the most successful according to the analyzed indicator. Farms specializing in horticulture and vegetable production (HOP) and pig and poultry farming (SVŽ) are mostly located in Central Serbia. On the other hand, Vojvodina has traditionally been home to farms with larger landholdings. Additionally, the higher level of economic development in this region has resulted in lower interest among workers in agricultural jobs, shifting the focus toward crop production, which is generally less labor-intensive. Consequently, HOP and SVŽ farms are not as prevalent in Vojvodina, leading to significantly lower results, particularly in pig and poultry farming.

In Central Serbia, farms specialized in viticulture (VIN), livestock production with grazing animals (STP), and crop farming (RAT) are in particularly difficult situations. These farms experience economic losses, meaning they are unable to cover total opportunity costs from their entrepreneurial profit or even operate at a net entrepreneurial loss, as is the case with VIN farms. The situation is slightly better in fruit growing (VOĆ) and mixed farms, which achieve an average economic profit of 3.0 and 2.3 thousand euros, respectively (Figure 1).

As previously mentioned, small farms are in a highly unfavorable position in terms of economic profit. From a regional perspective, only in Central Serbia, and specifically among farms specialized

in horticulture and vegetable production and pig and poultry farming, do we observe a very good average economic profit of 15.5 and 11.0 thousand euros, respectively (Figure 2).

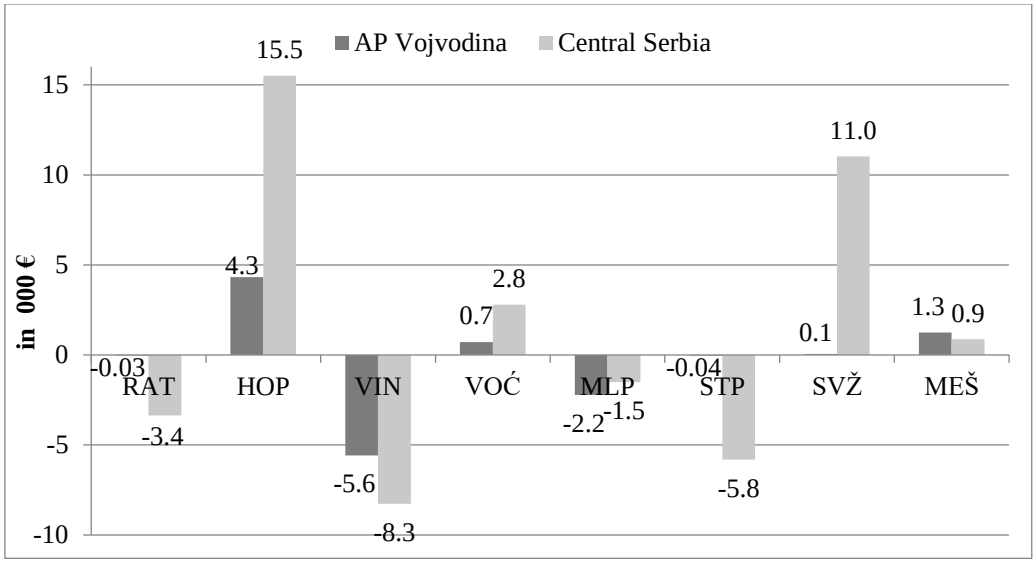

Figure 2. Economic profit of small farms by region.

From the above, it is clear that for HOP and SVŽ farms, economic size does not have a significant impact on performance indicators. Similar conclusions were reached by Miljatović [3], who highlighted that economic size does not influence the economic sustainability of farms specialized in horticulture and vegetable production (HOP) and poultry farming, while for farms specialized in pig farming, this influence is negative at the 10% significance threshold. This effect is particularly pronounced in Central Serbia, where HOP and SVŽ farms achieve significantly better results. Other production types are in a much worse position and often operate at an economic loss (Figure 2).

It is particularly important to highlight the poor results of STP and MLP farms, while VIN farms do not have a significant impact on the overall picture due to their very small share in the total number of commercial farms. STP and MLP farms are predominantly located in Central Serbia and constitute a significant portion of the total commercial farms. Farms engaged in livestock production with grazing animals (STP) are mostly oriented towards extensive production and are often situated in areas with difficult working conditions [9], which significantly contributes to the modest results recorded in Central Serbia.

Hloušková et al. [6] state that these farms do not abandon agricultural production because they often lack a viable alternative. STP farms are mainly managed by older and less-educated farmers who have limited opportunities to find employment in other sectors. They are emotionally attached to rural life and agriculture, as they have traditionally engaged in this activity, which also discourages them from leaving the sector.

On the other hand, MLP farms are particularly vulnerable in the lower classes of economic size. Large MLP farms, meaning those with higher production potential, are generally more economically sustainable [23].

5. Conclusions

Economic profit is a crucial indicator of the business success of family farms, where the dominant production factors (labor, capital, and land) are privately owned. When calculating economic profit, the opportunity costs of these production factors are included, allowing for a realistic assessment of the achieved level of economic sustainability of family farms.

Based on the obtained results, it is evident that farms with a faster asset turnover achieve higher economic profit. These are, of course, farms specialized in horticulture and vegetable production

(HOP) and pig and poultry farming (SVŽ). Due to their relatively high turnover coefficient, these types of production achieve very good results even among small farms. Other production types generally achieve very modest economic profit and often operate at an economic loss within the small farm category. The worst performers in this regard are farms specialized in viticulture (VIN), livestock production with grazing animals (STP), and dairy farming (MLP).

From a regional perspective, farms in the Vojvodina region achieve significantly higher average economic profit compared to those in Central Serbia. However, when looking at the farms with the highest levels of economic profit (HOP and SVŽ), the situation is reversed. HOP and especially SVŽ farms are significantly more successful in Central Serbia.

Economic profit can serve as a highly reliable indicator of the economic sustainability of farms. As an absolute indicator, it provides a precise measure of the real profit that family farms can generate. It is evident that more intensive production farms are also more economically sustainable, and for these farms, economic size is not a decisive factor in achieving an appropriate level of economic sustainability. In contrast, for farms engaged in more extensive production, economic size plays a significant role in determining the achieved level of economic sustainability.

Overall, the economic profit of Serbian farms is rather modest, except for those specialized in horticulture and vegetable production (HOP) and pig and poultry farming (SVŽ). This is especially pronounced among small farms with an economic size of up to €25,000 in standard production value, which is generally in a very poor economic situation. It is essential to focus on strengthening the economic viability of small farms through measures such as promoting farm cooperatives, implementing stricter regulations on agricultural imports, ensuring the timely payment of subsidies and premiums, and other policy initiatives. These efforts would increase the number of economically sustainable small farms and, consequently, improve the overall level of economic sustainability of farms in the Republic of Serbia.

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Conflicts of Interest: The authors declare no conflict of interest

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