THE IMPACT OF THE RISK PERCEPTION ON RENTABILITY IN THE ROMANIAN AGRICULTURAL SECTOR

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Abstract
This study examines the effect of different levels of rentability on the perception of the risks in the agri-business sector in Romania. The risks analysed are related to production, market, institutional, personnel and financial and the rentability ratios used are return on assets and return on equity. The research methodology consists in a qualitative study, with the data collected using field questionnaires. The convenience sampling was used as sampling method for 201 companies with farming activity in the vegetal nutrition area, the population being very large, and the financial data for 2021 consisted of analyses basis. A one-way ANOVA test was performed using SPSS software, combined with a descriptive analysis and homogeneity and robust tests. The results of the study show that it is likely that both return on assets and return on equity have a significant effect on the market risk perception. The market risk is related to the price volatility for agriculture inputs and crops and the farmers with higher rentability are more aware of these risks. The contributions of this approach are aimed both at the microeconomic level, providing benchmarks in the substantiation of strategies on risk-return trade-off, and at the macroeconomic level, providing a benchmark in the substantiation of policies in this field.

Keywords
Return on assets, return on equity, production risk, market risk, institutional risk, risk of personnel and financial risk.

JEL Classification
M10, G30, Q12, Q18

Introduction

Continuous, rapid and complex changes in the business environment, characterised by volatility and uncertainty, require economic entities to continuously adapt their strategies. The identification and assessment of risk, in its multiple dimensions, with its

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specificities in the field of activity, is an imperative management requirement for maintaining and developing the business.

From an equity investor's perspective, risk is associated with the return on the investment. There is a two-way relationship between risk and return. Thus, on the one hand, the assumption of a certain level of risk is matched by an expected return that will remunerate the invested capital accordingly. On the other hand, given a certain level of return, risk is perceived with a specific intensity.

The risk-return relationship shows sector-specific configurations. The agribusiness sector is affected by structural risks, such as production risk, market risk, institutional risk, risk of personnel and financial risk, amplified by cyclical risks. In Romania, this sector is characterized by structural weakness, adverse climatic conditions (persistent droughts or consistent precipitation) and the existence of diseases and pests. Moreover, the current conditions related to the energy crisis, which has significantly increased production prices in agriculture, the competition generated by the influx of goods from Ukraine at lower prices and inflation affect the profitability of companies and increase the risk in the sector.

Concerns about the agri-business sector are embodied in the policies and strategies of national and international decision-makers, as well as in scholarly studies. At the EU level, agriculture is considered one of the most complex, sensitive and critical sector, with decisions addressing both economic aspects (clear property rights, functioning markets, price liberalisation, macroeconomic stability, capacity to cope with competitive pressure) and standards (agricultural authorities with adequate administrative capacity, legislative alignment, establishment of market mechanisms such as: marketing standards, price reporting, quota management, producer organisations, public intervention mechanisms) (European Commission, 2023). Concerns in the study of risks in agriculture have focused on categories of risk, addressed independently or systemically, as well as correlations with different variables such as land size, number of years in operation, and legal form of the business.

The aim of this approach consists on the analysis of the effect of different levels of profitability on the perception of the risks. The contributions of the paper are found at both microeconomic and macroeconomic levels. Firstly, this paper studies the perception of the importance of risk on specific agri-business sector components: production risk, market risk, institutional risk, risk of personnel and financial risk in the case of Romanian companies. Secondly, the analysis establishes the peculiarities of the risk-return relationship in the agri-business sector, ensuring the effectiveness of the decisions that can be implemented at the microeconomic level both from the perspective of risk mitigation and profitability increase. Return on assets, as a measure of the efficiency of asset utilization, and return on equity, as a measure of the return on invested capital, were considered for the evaluation of profitability. Thirdly, the study is applicable at the macroeconomic level, in substantiating agricultural policies and for making the support payments.

1. Review of the scientific literature

Risk is a complex notion, defined as probability, chance or expected values, as undesirable events or dangers (Aven, 2012), and as uncertainties (Rosa, 2003). Furthermore, risk is assessed in an epistemic manner (Rohrmann, 1998), dependent on the knowledge, or from an ontological status perspective, independent of the assessors (Aven, et al., 2011). From the perspective of the consequences generated, the risk is "the possibility that a future action will generate losses, which will affect the assets, interests, activity and results of an economic agent" (Buglea and Lala Popa, 2009, pp.160). The decision-making process involves a multitude of economic, technical, legal, human and managerial variables that make it complex and associate numerous risks (Cismasu, 2003).

Studies on specific agri-business sector risks identify several risk categories. Production risks are caused by the unpredictability of crops' and livestock's' natural growth processes, and their usual sources include weather and climate (temperature, precipitation), pests, and illnesses. Production concerns include high levels of heavy metals in the soil and soil salinity, as additional yield-limiting or yield-reducing factors (Komarek, et al., 2020). Additionally, production risk in agriculture is generated by strict rules on the use of animal medicines, transfer of diseases across state borders, and specialization (Jankelova, et al., 2017). Population growth and changes in consumption patterns increase the pressure on the food system, under the conditions of compliance with climate change mitigation rules and reduction of greenhouse gas emissions (Vogel and Meyer, 2018). Production risk is correlated with the legal form of the business, with the greatest significance in the case of the risk perceived by self-employed farmers (Jankelova, et al., 2017).

Market risks mostly centre on cost, price, and market access uncertainty. Weather shocks and their consequences on yields, energy price shocks, and unequal access to information are other sources of market risk that can cause volatility in agricultural prices. International trade, liberalization, and protectionism are examples of market risks, with the potential to increase or limit market access at different spatial scales (Komarek, et al., 2020; Jankelova, et al., 2017). Also, the increase in specialization ensures price increases (Jankelova, et al., 2017). Significant positive correlations were found between the perception of the importance of price risk and the size of the land, i.e. the number of years in office (Jankelova, et al., 2017).

Institutional risks are connected to sudden changes in the laws and rules that apply to agriculture. The instability of government laws and regulations, over which farmers have little control, can affect the activity of farmers. Complementary, the acts of informal trading partners, rural producer associations, or shifts in social norms that have an impact on agriculture are just a few examples of informal institutions that might be sources of institutional risk. Institutions are assisting and connecting farmers more frequently, especially as agricultural production grows more geared toward the market (Komarek, et al., 2020).

Personal risks in agriculture are aimed at: "loss of skilled workers; working conditions; low wages; the price disparity; low prices product sales to processing enterprises; maladaptive financial support from the state; the inaccessibility of credit resources

because of high interest rates; low level of living and social improvement; the condition of the road network etc" (Ushachev, et al., 2017, pp.1).
Financial risk characterizes the variation of results under the impact of the financial structure (David-Sobolevschi, 2003). The use of credit implies the systematic incurrence of interest expenses, and fixed obligations, regardless of the results obtained. Financial leverage, changes in interest rates, credit conditions and access to credit are risk factors for the firm (Barry and Robison, 2001).
Risks are concatenated, generating synergistic effects. Thus, production shocks caused by weather, pests and diseases can be correlated with adverse movements in agricultural commodities and input prices, price spikes, or restricted market access. These risks can be low, manageable by producers, or they can be severe, requiring a broader response involving government finance. Failure to respond effectively to these more severe risks compromises long-term growth (Broka, et al., 2016).
The factors that ensure success in agriculture, as perceived through profit, are farm size, the control of cash expenses, the productivity of factors of production (land, labour, livestock), market price, financial structure (liquidity, leverage, asset structure), cost control, marketing factors, personal characteristics (age, experience, education), organizational structure, macroeconomic factors (Fox, et al., 2019).
The research gap that we have identified in the literature is the analysis of the risk-return relationship in the agri-business sector. The risk-return relationship assumed by the investor is the result of a trade-off, with higher returns being accompanied by higher risk, with the caveat that assuming higher risk does not guarantee higher returns. This relationship is also influenced by time; the longer the time horizon over which the return is expected to be achieved, the greater the risk.

2. Research methodology

The research topic of this approach consists on the relationship between rentability-risk in agri-business sector. The purpose of the study is to analyse the effect of different levels of rentability on the perception of the risks. The objectives of the research are: (i) to identify the main types of agricultural risks in Romanian agri-business sector; (ii) to elaborate an integrated risk evaluation system in agriculture; (iii) to analyse the risk perception under certain profitability conditions.
The study involved a questionnaire, structured in two parts. The first part was about identifying the entity and the financial data for 2021. The assessment of profitability was made considering return on assets and return on equity. The return on assets highlights the performance of the use of the capital invested in the total assets of an enterprise (Robu et al., 2014). The return on equity measures the return on the financial investment that shareholders have made in the company's capital (Pantea, 2017). The second part of the questionnaire aimed to assess the perception of risks, structured in five categories, according to their content: production risk - R1 - (climate, pests, diseases, etc.), market risk - R2 - (price volatility, costs, market access, etc.), institutional risk - R3 - (unpredictable changes in policies and regulations), risk of personnel - R4 - (shortages, health problems, etc.) and financial risk - R5 - (availability

of financing, interest costs). Respondents' attitudes and opinions are rated using a Likert scale from 1, considered very low, to 5, considered very high.
201 companies with farming activity in the vegetal nutrition area were investigated. The selection of these enterprises was realized by non-random sampling, being established a range of number of subjects for each county in Romania, according to the number of hectares they own compared to the total number of hectares in each county published by the Agricultural Payments Agency (APIA).
A one-way ANOVA test, the homogeneity and robust tests were performed using SPSS software.

3. Results and discussions

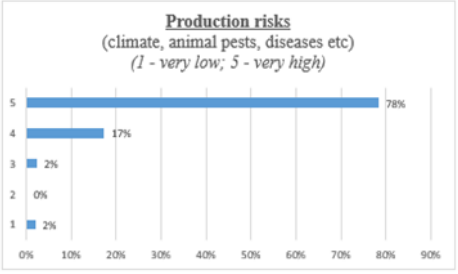
The multitude of risks affecting the agri-business sector in Romania implies a particular perception.

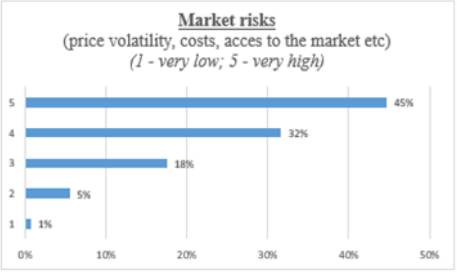
Table no. 1. Descriptive statistics

Indicators	R1	R2	R3	R4	R5
Mean	4.62	3.99	2.59	2.45	3.22
St. Dev	0.915	1.200	1.457	1.452	1.461

Source: own processing

At the level of the sample analysed, the greatest homogeneity in risk perception among farmers concerns production risk, with 78% of those surveyed reporting a very high reluctance to it. The mean value at the sample level is 4.62, and a mean deviation of 0.915. Climate factors, animal pests, diseases, etc. are the factors that most affect farmers' activity. The market risks are perceived as high in the agri-business sector in Romania, with 45% of respondents reporting a very high perception and 32% a high importance of the risk, with an average value at the sample level of 3.99. Considering the impact of price and production risk, managers' decisions are aimed at increasing the efficiency of the activity to improve the capacity to bear risks, especially as in agriculture, fixed costs have a high weight. Low productivity and low value-added affect agricultural production and development capacity.





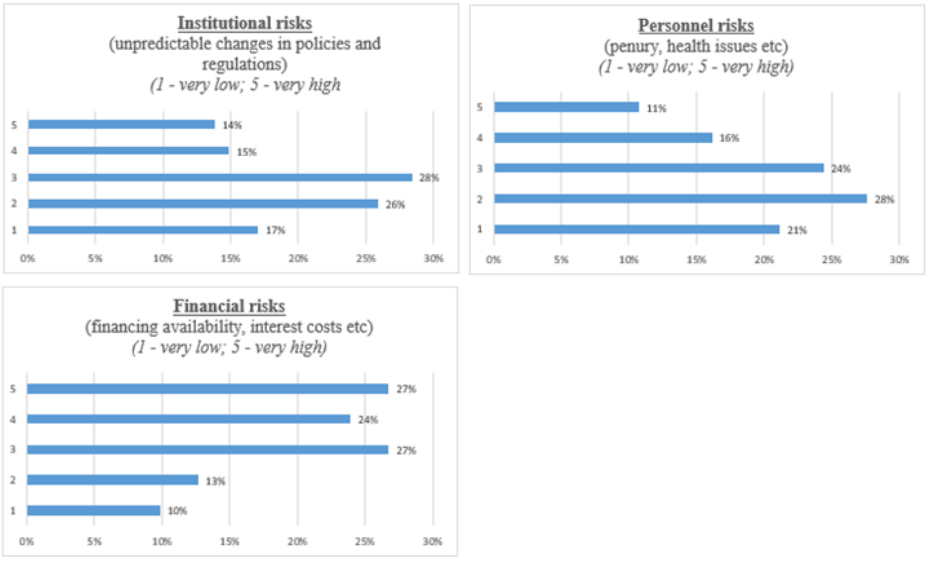


Figure no. 1. Risk perception
Source: own processing

Institutional risk is perceived as neutral, with an average value of 2.59. This situation can be explained by the low expectations of farmers from the institutions in the field, the experience revealing an unstable legal framework, a lack of consistency of measures, a low effectiveness of decisions. The conditions imposed by the authorities for granting subsidies, the programmes with non-reimbursable funding, the impact of the decision of the State Domains Agency not to renew lease contracts for long periods, but limited to 1 year, have affected the confidence of farmers in the institutions and lowered their expectations.

The perception of the importance of personnel risk is medium (2.45). In Romania, this sector is characterised by a very low supply of qualified personnel in the agricultural labour market, and by an ageing workforce, an important constraint to innovation. Low incomes, lower than in other sectors, affect the attractiveness of the labour force. Legislative measures in 2022 to boost employment have increased earnings in agriculture. Managing personnel risks by aligning wages to market conditions, training programmes, and individual and company performance-based pay schemes are aimed at productivity improvements. Enhancing the recruitment process of key personnel in the company is a factor for improvement.

The main sources of funding are farmers' contributions, bank loans, leasing, commercial credit, state-guaranteed loans and grants. The financial structure is associated with a specific risk, evaluated at the sample level at an average of 3.22, with a non-homogeneous structure: 27% of the farmers included in the sample perceive it as very high, i.e. neutral, 24% high, 13% low and 10% very low.

An increase in production risk can be correlated with and lead to market risk, which in an inefficient institutional environment and reduced access to external sources of finance can significantly affect farmers' activity. The structural lack of Romanian capital and the absence of coherent public policies affect the ability of Romanian farmers to borrow, and their competitiveness in relation to those who borrow on foreign markets at lower costs.
To evaluate the effect of different levels of profitability on the perception of the risks an analysis of variance (ANOVA) was conducted.

Table no. 2. Empirical results - ANOVA

ANOVA – F	R1	R2	R3	R4	R5
ROA	1.089	3.725*	1.468	3.236*	1.682
ROE	1.278	2.289***	0.386	0.133	0.839

Note: *p<0.05, ***p<0.1

Source: own processing

The results of the Test of Homogeneity of Variances are presented in Table 3.

Table no. 3. Empirical results - Test of Homogeneity of Variances

Test of Homogeneity of Variances	ROA		ROE	
	Levene Statistic	Sig.	Levene Statistic	Sig.
R1	5.392	.001	5.711	.001
R2	8.052	.000	5.627	.001
R3	.518	.671	.546	.652
R4	.026	.994	.196	.899
R5	3.104	.028	4.077	.008

Source: own processing

The p-value for the Levene test greater less than .05 highlights a significant difference between the variances. To test the robustness, Welch Test and Brown-Forsythe Test were performed (Table 4).

Table no. 4. Empirical results - Robust Tests of Equality of Means

Robust Tests of Equality of Means		ROA		ROE	
		Statistic	Sig.	Statistic	Sig.
R1	**Welch**	1.911	.133	1.604	.193
	Brown-Forsythe	1.090	.356	1.281	.283
R2	**Welch**	2.870	.040	2.244	.087
	Brown-Forsythe	3.723	.013	2.292	.080
R3	**Welch**	1.415	.242	.371	.774
	Brown-Forsythe	1.469	.224	.387	.763
R4	**Welch**	3.047	.032	.137	.938

	Brown-Forsythe	3.237	.023	.133	.940
R5	**Welch**	1.431	.238	.920	.434
	Brown-Forsythe	1.681	.173	.840	.474

Source: own processing

The results of the study show that in the case of Romanian farmers regarding the link between profitability and risk the following aspects are noted:

- the size of the rentability does not influence the perception of production risk, which is a high risk for all farmers. An important strategy in managing this category of risk is risk-sharing, especially insurance;
- the size of the rentability does not influence the perception of production risk, which is a high risk for all farmers. An important strategy in managing this category of risk is risk-sharing, especially insurance;
- the farmers with higher profitability are more aware of market risks. Both return on assets and return on equity have a significant effect on the market risk perception. A risk response in this case is hedging, which can narrow the range of possible prices, foregoing the opportunity of high prices, but protecting against the risk of a low price;
- higher returns are not associated with a higher degree of institutional risk perception. This is explained in Romania by the low level of trust farmers have in institutions. Inconsistency and inefficiency of decision-making in institutions, both domain-specific and general interest ones, diminish farmers' expectations, with a relative neutrality of this risk category;
- a high return of assets is associated with staff risk. In Romania, the personnel risk is generated by deficiencies in all dimensions: in terms of quantity, there is an acute shortage of personnel; in terms of quality, i.e. lack of knowledge and skills necessary to carry out agricultural activities; in terms of structure: old age of existing personnel, low proportion of qualified personnel, etc. These affect the efficiency of asset utilization, thus generating low productivity. The increase in agricultural productivity generates effects both at the microeconomic level (increased production, reduced costs) and at the macroeconomic level (reduces poverty, improves income distribution, ensures food security), constituting a topic of general interest;
- the farmers with higher profitability are not more aware of the financial risks: credit risk, liquidity and leverage risk. Access, costs, guarantees involved, as well as the size and volatile interest rates that reduced the return on assets and increased the financial risk are the elements considered in the lending decision. Romanian farmers' credit requests remain mostly unsatisfied, due to insufficient collateral, an inadequate relationship with the bank, the weak presence of bank branches in rural areas.

Conclusions

Rational behaviour implies the pursuit of a gain under the conditions of awareness of the degree of risk assumed. The investment decision may be to avoid investing in risky activities or to take risks and manage accordingly. Agriculture is a sector affected by both general and specific factors, which combine to generate multiplier effects on results. Risk management is a current, significant issue for farmers that must include

both dimensions of objective uncertainty and subjective uncertainty. The present study performs an assessment of risks in Romanian agri-business, in an individual approach (production risk, market risk, institutional risk, risk of personnel and financial risk), as well as identifying determinisms in the case of the integrated approach. Furthermore, the risk perception under certain profitability conditions was analysed. It was found that in case of a high return on assets and return of equity market risk is perceived more acutely. A higher level of staff risk is perceived in the case of farmers with a higher return on assets.

The identification of potential research gaps allows the formulation of future research directions. A limit of the study carried out consists of the selected sample, the analysis only concerns companies with farming activity in the vegetal nutrition area. The research can be extended and customised by activities: plant cultivation and animal husbandry, with the specification of specific risk management strategies. Considering profit as the main objective of capital investment, the perception of risk in relation to profitability was assessed. Future research should include liquidity and solvency indicators. Furthermore, the risk components can be analysed by explanatory factors, detecting the impact of their change on the results.

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