

-RESEARCH ARTICLE-

## FINANCIAL RISK ANALYSIS IN THE INTENSIVE POULTRY GROWTH IN THE REPUBLIC OF KOSOVO

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—Abstract—

Financial risk analysis is essential to the long-term success of agricultural businesses. Numerous methods are available to researchers for analyzing and evaluating financial risk occurrences. The results of its application assist owners and managers in addressing financial risk when making decisions. Even though numerous studies have been conducted on risk management, there are still research gaps in certain agricultural fields. This study analyzed the financial risk associated with egg and meat production on chicken farms using qualitative and quantitative methods. The research was conducted in the Republic of Kosovo. The study's findings familiarize farmers with the frequency and severity of financial risk events. Finally, responses to financial risk are advised.

**Keywords:** Risk, financial, probability, qualitative and quantitative evaluation, matrix, Kosovo.

JEL Classification: M10, O13, Q14

## 1. INTRODUCTION

The area of the Kosovo Republic is 10,908 km<sup>2</sup>. It is located in the center of the Balkan Peninsula in the region of Southeastern Europe that shares borders with Albania, Montenegro, Serbia, and Northern Macedonia (KAS, 2016). Population estimate: 1,798 188 (KAS, 2020). Kosovo has seven regions and 38 municipalities (KAS, 2016), and its capital is Prishtina; Figure 1 depicts Kosovo's geographical location.

Kosovo has developed a competitive egg production industry due to sunny days, fertile soil, road infrastructure, suitable market, and consumer culture. Eggs are a vital food product, but they are also thought to be the staple food of developing nations and excessively hazardous to health. However, eggs are a traditional food with a higher per capita consumption even in economically developed nations with a high standard of living. Currently, egg producers in Kosovo work within a functional market and satisfy domestic demand.

In Kosovo, the poultry sector (broilers, laying hens, birds, chickens, other turkeys, goslings, ducks and geese, other birds: African chickens, pigeons, etc.) has begun to develop chicken meat production in recent years. In 2020, the total number of poultry in Kosovo increased by 4.4% compared to 2019. (MAFRD, 2021). The average egg consumption per capita is estimated to be 206 eggs per year, and Kosovo meets around 99 percent of its egg consumption needs. However, production only provides 7.1% of the nation's egg consumption (MAFRD, 2021).

Considering the small size of the farms and the antiquated nature of the technology, egg production in Kosovo is more expensive than in other nations. The average annual egg production per animal is 295. (MAFRD, 2016). Before the Covid-19 pandemic and the war in Ukraine, the average price of a pack of 30 eggs was €2.30; after the pandemic

and the war, the price ranges from €3.59 to €4.19 per pack. According to a 2016 study by MAFRD, 81% of total revenue is comprised of variable expenses. About 70% of the expenses are for food, and 23% are for the purchase of broiler chickens (18 weeks old). The remaining expenses include municipal, veterinary, and slaughtering costs and packaging and delivery costs. Expenses represent 4% of total revenue. Based on variable and fixed costs, an egg's production cost was €0.07, while it remains higher today. In 2013, direct payments for poultry subsidies began for the initial time. The unit payment has changed depending on the number of chickens on the farm. Applicants with 2,400 to 10,000 laying hens on their farm received €0.50 per hen, those with 10,000 to 20,000 hens received €0.40 per hen, and those with more than 20,000 hens received €0.30 per hen. The same method of subsidizing continued in subsequent years.



**Figure 1.** Map of the Republic of Kosovo

## 2. LITERATURE REVIEW

### 2.1 Financial Risk On Agricultural And Livestock Farms

Financial risks include insufficient finances to fulfill anticipated obligations, lower-than-expected revenue, and farm capital loss (Sciabarrasi, 2021). Due to the wide variety of uses (Crane et al., 2013), such as payments of production factor costs, rent, debts, wages, taxes, and debt repayment, on-farm cash flows are crucial. When a farm business borrows money, it incurs financial risk (Saqib et al., 2016) and is accountable for debt repayment (USAD-ERS, 2020). The farm's survival rests on its ability to obtain the necessary loans, despite the numerous risks associated. Small farmers' costs involved with securing a loan are somewhat higher (Reynolds-Allie et al., 2013). Future lenders' willingness to offer credit is uncertain, and fluctuating interest rates raise the risk of borrowing (Drollette, 2009). Inflation and interest rate fluctuations are substantial financial hazards (Green, 2003).

Researchers of the risk management of agricultural enterprises have identified five key categories: (1) production risk, (2) market risk, (3) financial risk, (4) legal/institutional risk, and (5) human resources risk. Organization for Economic Co-operation and Development, 2000, [Ranjbar et al. \(2021\)](#); [Schaffnit-Chatterjee et al. \(2010\)](#); [Thomas \(2018\)](#). According to [Sciabarrasi \(2021\)](#), these are the five most serious agricultural dangers. As reported by [Komarek et al. \(2020\)](#), most studies concern production risk, followed by market risk, legal risk, financial risk, and human resource risk. This study seeks to understand how the views and attitudes of farmers toward risk impact their management and risk management choices ([Ullah et al., 2015](#)). In this study, we will estimate the financial risk. The conceptual foundation for this investigation is depicted in [Figure 1](#).

[K. Akanni \(2007\)](#) investigates the impact of microfinance on chicken farms in Nigeria using descriptive statistics and the Tobit regression model. The data indicate that most farmers obtain financing from personal and cooperative sources and that poultry farmers confront several economic challenges due to their limited access to investment capital. Most financial institutions view poultry production as a high-risk investment due to the high mortality rate and, in many instances, the low output ([O. P. Akanni, 2007](#); [Borjas, 1991](#)). [Obike et al. \(2017\)](#) investigate the risk management techniques and predictors of output in small-scale poultry farms in Nigeria by collecting questionnaire data from 120 chicken farms. The OLS study reveals that various risk factors, including financial, human, production, marketing, and technological factors, impede the poultry sector's output growth. In addition, the researcher identified several risk factors, such as disease outbreaks, the high cost of medications and vaccines, insufficient funds, a lack of high-quality feed, and the fragility of poultry products, and suggested that government initiatives involving the provision of credit facilities, high-quality feed, and vaccines would assist farms in avoiding these risks and increasing their poultry output. [Yusuf \(2018\)](#) find that the output of poultry farms is inversely correlated with the rise in Kwara State, Nigeria.

[Gotz et al. \(2009\)](#) classified agricultural risk sources as social, market, institutional, financial, production, and foreign exchange ([Akinola, 2014](#); [Kahan, 2008](#); [Medalie et al., 1968](#); [O. Y. Salman, W. Abbas, Muhammad Ibrahim, 2017](#)). Another study identified several financial hazards in chicken farms, including market risks, inflation, interest rates as proxies for financial risk, and weather and illness as production risks ([Olarinde et al., 2010](#)). [Adeyonu et al. \(2021\)](#) investigate the perception of risk and risk management techniques among commercial poultry farmers in Nigeria using a multi-stage selection technique to pick 263 respondents and a questionnaire to gather data. Farmers viewed production, financial, and human risk as the most significant in the chicken business, as indicated by the linear regression model. There is a need for poultry farmers to employ financial management and disease-preventive techniques to reduce the negative effects of these risks. Strategies for financial management include high loadings on mixed farming, diversification, non-farm income, credit borrowing, pre-

purchase of inputs, sale of assets, and agricultural insurance. In addition, the researcher stated that experience in the poultry sector and the firm's value should be considered essential factors for mitigating risks and implementing solutions. In addition, the researcher determined that fluctuations in output prices, loan availability, input prices, unavailability of inputs, and changes in revenue from other sources contributed significantly to financial risk (Adeyonu et al., 2021).

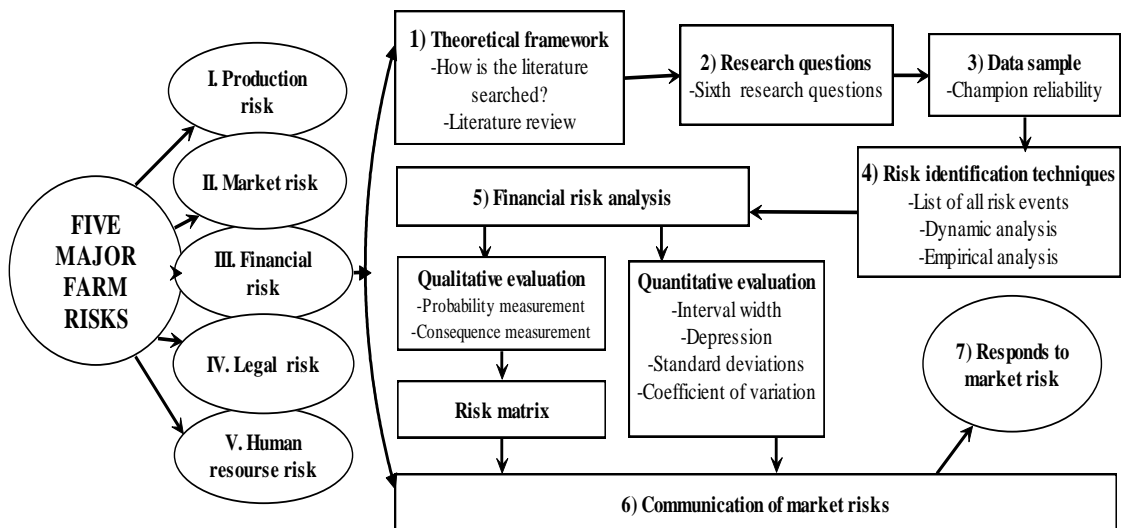
J. Salman (2014) investigated the sources of risk and assessed the farmer's attitudes towards them and risk aversion strategies by surveying 74 poultry farmers. Economic risk is a proxy for financial risk; economic risk consists of input price fluctuations, output price fluctuations, and input unavailability. A researcher analyzes a study using the safety-first behavioral model and the censored Tobit model and concludes that input price fluctuations pose the greatest risk, followed by labor inefficiency. Researchers also discovered that experience in poultry farming and the quantity of credit received greatly lowered farmers' risk aversion. Financial risk is linked with unfavorable yield variance due to inclement weather, disease outbreak, insufficient and untimely input supplies, inadequate credit, and poor processing facilities (Obike et al., 2017). Utilizing debt to finance agricultural operations exposes farmers to financial risk. When a farm's profit is less than its expenses, we say it faces financial danger (Alimi et al., 2005). According to numerous studies, financial risk is the most significant category of risk in the poultry sector (Akinbile et al., 2013; Hussain et al., 2015; Melesse, 2014; Nguyen et al., 2007; J. Salman, 2014).

Kabir et al. (2021) examine the impact of Covid 19 on the boiler industry in the United States. Net cash flow is used as a proxy for financial risk. The researchers discovered that due to the closure of restaurants and other services that rely on chicken demand, there is an excessive supply of chicken, and the industry suffers losses. Despite the relative consistency of the pay rate, adverse changes in key production indicators can pose a substantial financial risk for contract growers. One of the greatest threats to the financial stability of a contract broiler farmer is that a disruption in production may reduce cash flow to the point that debt cannot be serviced (MacDonald, 2011). Financial risk is a significant barrier to farm innovation; higher expenses and labor investments entail a greater investment risk (de Olde et al., 2017; Min et al., 2006). Perkins et al. (2020) will investigate the sustainability difficulties and trade-offs in the Dutch egg sector by gathering data from 24 stakeholder interviews; they will conclude that financial risk impedes innovation and sustainability in egg production farms. Researchers view the continuous upscaling of farms as a barrier to sustainability, which has ramifications for the number of capital flows and associated financial concerns. According to Sorgdrager et al. (2018), due to the usage of fipronil in egg production, the Netherlands Food and Consumer Safety Authority (NFCSA) restricted over 200 farms from transporting eggs, hens, and dung off their farm, resulting in a financial impact on the egg industry. Allen et al. (2020) evaluate the farm financial effects of an avian influenza outbreak on a beginner and an experienced farmer's commercial broiler operation in the

United States. When avian influenza is contracted early in the investment period and when the contamination and eradication of the virus are protracted, novice and experienced farmers incur financial risk. Gender is inversely correlated with financial risk mitigation techniques, and female business owners used more financial risk mitigation strategies than male respondents. Financial risk and financial strategies are positively correlated because, as risk increases, so do preventative measures. Agriculture, cattle, and poultry are different industries. Diverse risk events exist in these sectors. Prior research in the poultry industry has concentrated on egg production costs (MAFRD, 2016; Maloku et al., 2017); salmonella disease (Hulaj et al., 2016; Rizani, 2017; Safitri et al., 2015); and the use of antibiotics in chicken feed. Based on this fact, there is a research gap in risk management in Kosovo's livestock industry. The previous two publications analyzed production risk events (A. A. Murrja et al., 2022) and market risk events (A. A. Murrja et al., 2022). This paper focuses on identifying financial risk factors in intensive chicken farms, their evaluation, and acquainting Kosovar farmers with the severity and frequency of financial risk events. In addition, this research intends to offer farmers the appropriate instruments or tactics for managing financial risk events.

## 2.2 Use of Qualitative and Quantitative Techniques

The qualitative method focuses on detecting procedures and logical reasoning (Patton, 1987), incorporates experience, knowledge, and creativity (Emblemsvåg et al., 2006), and is grounded in empirical analysis. Qualitative risk assessment aims to provide information about sources and their potential outcomes. While the quantitative method is predictive of certain risk levels and employs mathematical models (Ramachandran et al., 2011), the qualitative method does not. These methods are essential for farm enterprise risk analysis.



**Figure 2.** Conceptual Framework of the Study

**Source:** Adopted to our study from A. A. Murrja et al. (2022).

### 3. METHODOLOGY

The conceptual foundation for this investigation is depicted in Figure 1. This framework is based on several authors and standards of international risk institutions (AIRMIC et al., 2010; Bernstein et al., 1996; W. Fletcher, 2005; W. J. Fletcher, 2015; Jan et al., 2002; Murrja A, 2021; A. Murrja et al., 2021; Pullan et al., 2017; B. Standard, 2011; I. Standard, 2018), which have been adapted to fit the needs of the present study.

#### 3.1 Theoretical Framework

This study's theoretical framework is based on: 1) a large number of items that our study fits within; 2) existing theories of literature; 3) tests and certifications of other researchers; 4) an essay; 5) the formation of an opinion to approach unknown research; 6) a theory related to the proposals of other researchers, and 7) the use of theory to predict and control situations within the context of this study. Research literature research is conducted to satisfy the requirements of the theoretical framework (Pham et al., 2020) using the following terms: "Farm/agricultural risk management," "Qualitative risk assessment of farm financial/agriculture," "Quantitative assessment of farm financial risk/in agriculture" "Quantitative and qualitative risk assessment of farm financial/agriculture."

#### 3.2 Study Research Questions

This study addresses the following research questions:

1. Which financial risk events are risk factors with very low and low levels or have mouse aggression?
2. Which financial risk events are moderate risk factors (high and very high probability and small and very small impact) or have rabbit aggressiveness?
3. Which financial risk events are moderate risk factors (low and very low probability and large and very large impact) or have shark aggressiveness?
4. Which financial risk events are risk factors with a very high level or have the lion aggressiveness?
5. Does the risk perceived by farmers match the value of the caused damage?
6. What is the relative variation of the loss from financial risk events (quantitative assessment to measure objective risk)?

#### 3.3 Data Sample

The study includes intensive poultry farms for egg and meat production. The total number of intensive poultry farms in Kosovo is 160 (MAFRD, 2018). A sample of 33 farmers or farm managers, or farm economists, who were randomly interviewed in 7 regions of Kosovo, was used to assess financial risk factors (20% of the total number of farms). The following formula was used to measure the reliability of the sample size:

$$t = \frac{\bar{x} - \mu}{S/\sqrt{n}} \quad \text{where} \quad \mu = \bar{x} - t \frac{S}{\sqrt{n}}$$

$\mu$  - Average population data;

$\bar{x}$  – Average choice (5.5);  $t$  – Confidence level  $(1-\alpha) = 0.95$  and safety  $\alpha = 0.05$ , where value  $Z_{\alpha} = 1.96$ ;  $S$  – The variance of choice (3,26);  $n$  – Sample size (33).

To calculate the variance of choice were used the data in Table 1 and the formula

$$S^2 = \sum_{i=1}^m \frac{(x_i - \bar{x})^2}{n - 1} \text{ where } S = \sqrt{S^2}.$$

$x_i$  – Number of farmers or managers interviewed for each region.

**Table 1. Estimation of the Sample Confidence Level**

No.	Region	$x_i$	$\bar{x}$	$(x_i - \bar{x})$	$(x_i - \bar{x})^2$
1	Ferizaj	2	5.5	(3.5)	12.3
2	Gjakova	8	5.5	2.5	6.3
3	Gjilan	5	5.5	(0.5)	0.3
4	Mitrovica	2	5.5	(3.5)	12.3
5	Peja	3	5.5	(2.5)	6.3
6	Prishtina	10	5.5	4.5	20.3
7	Prizren	3	5.5	(2.5)	6.3
<b>The number of regions is 7</b>		<b>n=33</b>	$\bar{x} = 33/6$		$\sum(x_i - \bar{x})^2 = 63,8$

**Source:** Authors' Elaboration.

Therefore,  $S^2 = 63,8/6 = 10,63$ , and  $S = \sqrt{10,63} = 3,26$ . By choosing the confidence level  $(1-\alpha) = 0,95$ , we obtain:  $0,95 = \Pr(\bar{x} - t * S / \sqrt{n}) \leq \mu \leq (\bar{x} + t * S / \sqrt{n})$ , in which variance with distribution farmer  $t$  with  $(n-1)$  degree of freedom, is such that the value  $t_{(n-1;0,05)}$  fulfills the condition that integral  $if(t;n-1)$  between  $-t_{(n-1;0,05)}$  and  $t_{(n-1;0,05)}$  is 0,95. In our study we have  $0,95 = \text{Propabiliteti}[5,5 - 0,95(3,26/5,74)] \leq \mu \leq [5,5 + 0,95(3,26/5,74)]$ . Thus, we obtain  $4,96 \leq \mu \leq 6,04$ .

### 3.4 Financial Risk Identification Techniques

To make an acceptable risk management choice, it is essential to evaluate risks using an integrated strategy by calculating all potential hazards. There are numerous risks, and to regulate and manage them, it is essential to comprehend and identify their sources (Hardaker, 2007). (Cox Jr et al., 2005; Emblemståg et al., 2006; Hopkin, 2018; Jordaan et al., 2013; Leppälä et al., 2012; Srinivas, 2020; Wieland et al., 2011) have been utilized to identify financial risks. Based on event dynamics and empirical analysis (practice and experience), a comprehensive list of all financial hazards has been compiled (see Table 3).



### 3.5 Financial Risk Analysis

Risk measures (IRM; IIA; Orange Book) that generate the risk factor are probability and outcome (Cooper et al., 2005; Jankelová et al., 2020). Riwithong et al. (2017) assessed farmers' perceptions of financial risk using a 5-point Likert scale (Rizwan et al., 2020). A qualitative risk assessment describes the likelihood of something going wrong and the resulting consequences (Wang et al., 2000). A risk factor (RF) is an assessment of dangers based on the product of probability (P) and consequence (C) (Cooper et al., 2005). Farmers or managers were asked to rate the incidence and severity of each source of financial risk on a Likert scale ranging from 1 (very low) to 5 (extremely high) to indicate the potential impact of each source of risk on the farm. These data are incorporated into the risk matrices depicted in Figures 3 and 4. Tables 2 and 3 provide broad descriptions and qualitative evaluations of the frequency and impact of financial risk events. Financial risk is critical to strategic risk analysis (Jan et al., 2002).

**Table 2: Generic Description and Qualitative Assessment (in Numbers, Words, And Colors) of the Event Probability**

Possibility of event occurrence	Frequency in 5 years	Scale	Probability in words	Color rating
Event occurrence almost impossible (1%)	1 time	1	Very low	Green
Rare event occurrence (2%)	2-10 times	2	Low	Light green
Possible event occurrence (3-9%)	11-30 times	3	Average	Yellow
Frequent event occurrence (10-39%)	31-40 times	4	High	Orange
Almost certain event occurrences (mbi 40%)	Over 41 times	5	Very high	Red

**Table 3: Generic Description and Qualitative Assessment (in Numbers, Words, And Colors) of the Event Consequences**

Consequence description	Value of damage	Scale	Consequences in words	Color rating
Very low consequence	Up to 1,150€	(1-3)	Very low	Green
Low consequence	1,151€ - 2,300 €	(4-6)	Low	Light green
Average consequence	2,301€ - 10,150 €	(7-9)	Average	Yellow
High consequence	10,151€- 44,000 €	(10-12)	High	Orange
Very high consequence	Over 44,000€	(13-15)	Very high	Red

**Source:** Adopted to our study from W. Fletcher (2005), Wieland et al. (2011), W. J. Fletcher (2015), Oliveira et al. (2019), Newman et al. (2018), Islam et al. (2020), A. A. Murrja et al. (2022) (Table 2 and Table 3).

*Questionnaire design:* The questionnaire consists of ten free-form questions. For each risk occurrence, a Likert assessment of probability and consequence is required, ranging

from 1 (extremely low) to 5 (very high), as well as the average monetary value of the damage for the previous five years (2017-2021). (Column 6, [Table 5](#)).

### 3.6 Qualitative Financial Risk Assessment

Each risk source was coded to facilitate their presentation in the risk matrix ([Castro et al., 2009](#); [Herbst et al., 2020](#); [Wilkinson et al., 2013](#)).

**Table 4: Nominal Assessment of Market Risk Events (Placement of Odes or Symbols)**

	Financial risk event	Symbol
1	Lack of sufficient money to pay obligations.	R <sub>f1</sub>
2	Realization of lower-than-expected profits (mismatching of projected profits with actual profit).	R <sub>f2</sub>
3	High cost of production factors.	R <sub>f3</sub>
4	Excessive borrowing (debt) and high-interest rates	R <sub>f4</sub>
5	Higher demands on money for family needs.	R <sub>f5</sub>
6	Inaccurate production forecasts.	R <sub>f6</sub>
7	Fluctuations of currency exchange rates.	R <sub>f7</sub>
8	The economic decline of the country.	R <sub>f8</sub>
9	Inflation.	R <sub>f9</sub>

**Source:** Authors' elaboration.

*Risk matrix:* Utilizing the matrix to depict the probability and magnitude of the risk impact (risk factor) is a crucial risk management technique ([Hopkin, 2018](#)). [Figure 3](#) illustrates the matrix according to financial risk levels ranging from 1 (very low) to 5 (extremely high), whereas [Figure 4](#) depicts the matrix of financial risk aggressiveness.

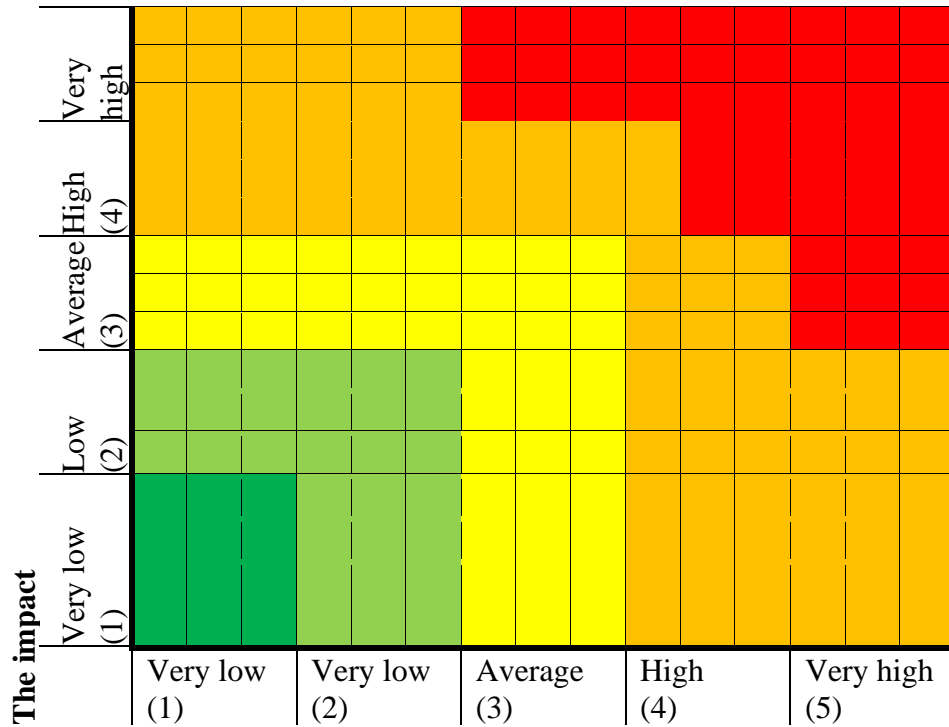
### 3.7 Quantitative Estimation of Financial Risk

To evaluate quantitative financial risk, this study has employed the following statistical estimates:

- 1) Interval width:  $I_{\text{width}} = X_{\text{max}} - X_{\text{min}}$ ;
- 2) Depression:  $D^2 = \sum (x_i - \bar{x})^2 / n - 1$ ;
- 3) Standard deviation:  $D = \sqrt{D^2}$  ; and
- 4) Coefficient of Variation  $C_v = (D / \bar{x}) * 100$ .

### 3.8 Financial Risk Communication

The purpose of risk communication between researchers, managers, stakeholders, and the public should provide information for better decision-making ([Garcia, 2005](#); [Peterman, 2004](#)). The research focuses on communicating financial risk events to farmers.

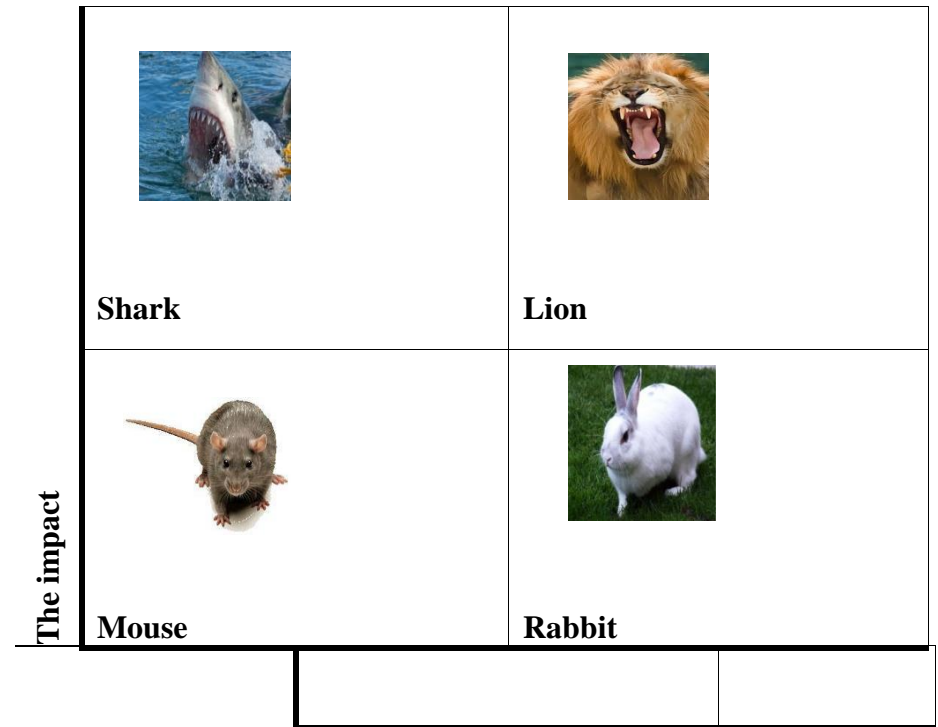


Likely

**Figure 3:** Matrix of qualitative risk levels.

Source (Figure 3): Adapted for our study by Rosenberg (1999), Cooper et al. (2005), Astles et al. (2006), W. J. Fletcher (2015), Ullah et al. (2015), A. A. Murrja et al. (2022).

Source(Figure 3): Adapted from Farag (2015); A. A. Murrja et al. (2022).



Likely

**Figure 4:** Risk aggressiveness matrix

## 4. STUDY RESULTS

### 4.1 Analysis of Qualitative Financial Risk Assessment

Table 5 shows the average probability and consequence findings for market risk occurrences and their combinations (risk factors) over the past five years, as well as the average worth of the financial damage in euros (2017-2021).

**Table 5. Combined Assessment of Probability with the Consequence (Risk Factor) and the Value Of Damage in Euros For Each Event**

Risk code	Financial risk events	Probability	Consequence	Risk factor	Damage value
(1)	(2)	(3)	(4)	(5)=3*4	(6)
R <sub>f1</sub>	Lack of sufficient money to pay obligations.	3	9	<b>27</b>	10,000
R <sub>f2</sub>	Realization of lower-than-expected profits.	3	13	<b>39</b>	43,000
R <sub>f3</sub>	High cost of production factors.	4	11	<b>44</b>	42,000
R <sub>f4</sub>	Excessive borrowing (debt) and high-interest rates.	2	10	<b>20</b>	15,000
R <sub>f5</sub>	Higher demands on money for family needs.	3	9	<b>27</b>	9,000
R <sub>f6</sub>	Inaccurate production forecasts.	2	7	<b>14</b>	8,000
R <sub>f7</sub>	Fluctuations of currency exchange rates.	1	3	<b>3</b>	1,500
R <sub>f8</sub>	The economic decline of the country.	2	6	<b>12</b>	1,000
R <sub>f9</sub>	Inflation.	1	4	<b>4</b>	500

**Source:** Authors' Elaboration.





The perception of financial risk factors follows the trend of financial losses, meaning that farmers' perceptions correspond to the extent of the damage.

Regarding the nine financial risk occurrences, farmers view two as extremely high-risk components, one as a high-risk component, three as medium-risk components, two as low-risk components, and one as an extremely low-risk component.

### 4.2 Quantitative Assessment Analysis of Financial Risk

Financial risk events are characterized by a very large interval width (42,500 €), a very large standard deviation (46,900 €), and a very high coefficient of variation (325%).

**Figure 5: Matrix of Financial Risk Assessment**

<b>Consequence</b>	Very high (13-15)			<b>Rf2</b>			
	Higt (10-12)		<b>Rf4</b>		<b>Rf3</b>		
	Avarge (7-9)			<b>Rf5 ;Rf1</b>			
	Low (4-6)		<b>Rf6</b>				
			<b>Rf8</b>				
	Very Low (1-3)		<b>Rf9</b>				
		<b>Rf7</b>					
Financial risks on intensive growth farms in Kosovo		Very Low	Low	Avarge	Higt	Very higt	
		1	2	3	4	5	
		<b>Probability</b>					

**Source:** Authors' Elaboration.

### 4.3 Analysis of Dispersion and Standard Deviation

The depression dispersion of damage from financial risk events is reflected in [Graph 1](#).

Of the 9 financial risk events, 3 include the average value of the damage plus and minus the standard deviation or 33 % of the total financial risk events.

## 5. CONCLUSIONS

Based on the financial risk psychometric study, the following conclusions can be drawn:

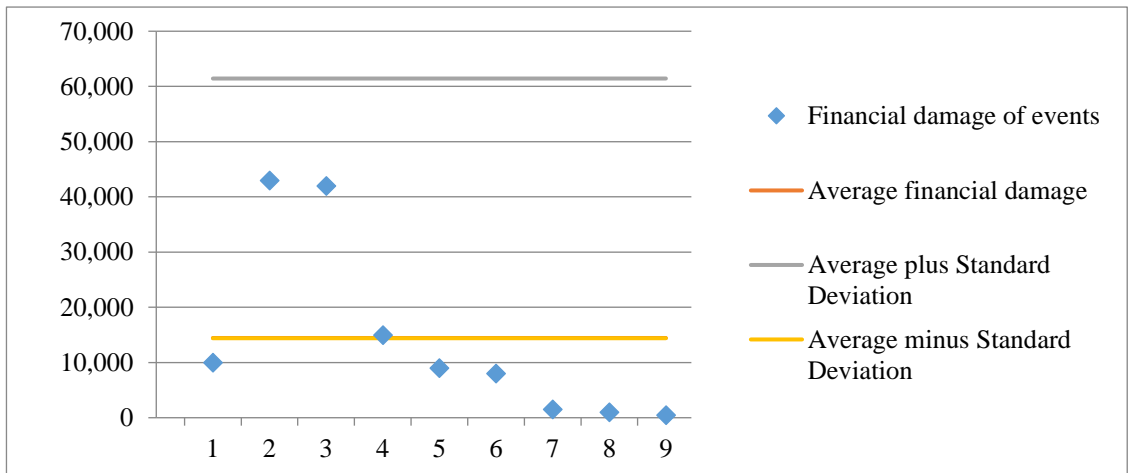
Farmers' perceived financial risk factors are proportional to the trend of the damage, indicating that the perception is consistent with the magnitude of the damage. Farmers are aware of potential monetary risks.

Based on the quantitative analysis of the financial risk, the following conclusions are drawn:

**Table 6. Calculation Of Statistical Measures of Financial Risk Events (Data in Euro)**

$n$	$x_i$	$\bar{x}$	$(x_i - \bar{x})$	$(x_i - \bar{x})^2$
1	10,000	14,444	(4,444)	19,749,136
2	43,000	14,444	28,556	815,445,136
3	42,000	14,444	27,556	759,333,136
4	15,000	14,444	556	309,136
5	9,000	14,444	(5,444)	29,637,136
6	8,000	14,444	(6,444)	41,525,136
7	1,500	14,444	(12,944)	167,547,136
8	1,000	14,444	(13,444)	180,741,136
9	500	14,444	(13,944)	194,435,136
Interval width ( $I_{width}$ )				<b>42,500</b>
Depression ( $D^2$ )				<b>33%</b>
Standard deviation (D)				<b>46,990</b>
Coefficient of Variation ( $C_v$ )				<b>325%</b>

Source: Authors' elaboration.



**Graph 1: Dispersion of Damage from Financial Risk Events**

Source: Authors' elaboration

1. The spectrum of financial risk occurrences is expansive (€42,560). [€10,151 - €44,000] This value exceeds the sector with major financial effects. (see [Table 3](#)). However, the width of the chasm is not a reliable measure of hazard, especially when the cost of damage is considered. The range primarily guides farmers to acquire production elements and sell final items.
2. A relatively small dispersion of 33% equates to an occurrence probability of 33%.

3. 3. The mean standard deviation (46,990) falls into the category of incredibly significant financial repercussions [over €44,000]; (see [Table 3](#)).
- 4.
5. Very high coefficient of variation (325%)
6. 5. Based on the prediction of the relative variation of losses from the average of €14,444, minus or plus €46,990 results, which means that in the case of good management, financial risk losses can reach €14,397 and human resource risk losses can reach €61,434. According to the common definitions of financial losses in [Table 3](#), these losses are significant. This illustrates that the financial risk on a farm needs a substantial investment on the part of farmers to offset the financial repercussions.

## 6. RECOMMENDATIONS

The audit aims to ensure that risks are not taken that exceed the organization's capacity to withstand losses in the worst-case scenario ([Aleknavičienė, 2019](#)). Communication, answers to research questions, and recommendations for using instruments or methods to address financial risk events are presented in [Table 7](#).

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**Table 7. Communication of Financial Risk Events According to Qualitative Assessment and Recommendations**

Risk events	Risk factor	The aggression of risk events	Impact of risk factor	Risk response (strategies of treatment)
R <sub>f7</sub> -Fluctuations of currency exchange rates. R <sub>f9</sub> - Inflation. R <sub>f8</sub> - Economic decline of the country.	Very low Low		Inconsiderable Insignificant	1) Self-financing. Does not affect farm objectives.
No risk event	Medium		Medium Presence of fear.	1) Financial strategic planning. 2) Monitoring of financial reports.
R <sub>f6</sub> - Inaccurate production forecasts. R <sub>f5</sub> - Higher demands on money for family needs.	Medium		Medium, High, and Very High Their impact causes serious damage.	3) Renegotiation of agreements with customers and suppliers. 4) Control of unnecessary household expenses 5) Employing family members outside the farm. 6) Joining farmers into more evolved structures. 7) Ability to get subsidies and grants.
R <sub>f4</sub> - Excessive borrowing (debt) and high-interest rates. R <sub>f2</sub> -Realization of lower than expected profits (mismatching of projected profits with actual profit).	High Very high			
R <sub>f1</sub> - Lack of sufficient money to pay obligations. R <sub>f3</sub> - High cost of production factors.	Very high		Very high The impact is catastrophic.	

Source: Authors' Elaboration