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REGIONAL ECONOMIC ENVIRONMENT: INSIGHTS FROM NORTH MACEDONIA´S AGRICULTURAL SECTOR

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Abstract: The role of agriculture in the broader development process is extensively explored, but with no particular focus on the direct and indirect linkages among factors considering the influence of the business environment on the regional economy. This study explores the managerial perception of agricultural companies in North Macedonia regarding the status, prospects, and challenges for agriculture within the regional economy when having cooperation with Albania, Serbia, and Montenegro. A comprehensive five-stage methodology was applied to assess the factors of influence underlying the pros and cons of agricultural development. These stages encompassed a literature review, the construction of a theoretical model, data collection, principal component analysis, and the application of structural equation modeling. Three direct and two indirect linkages are hypothesized for constructing a model that quantifies the impacts of the business environment essential for the regional economy. The highest significant threshold is found for the direct path of COVID-19, followed by a strong negative direct connection to the Russia-Ukraine crisis, and a medium direct effect of governmental support. The latter indicated the Russia-Ukraine crisis and COVID-19 as having extremely strong indirect connections to the regional economy. So, supporting measures and activities of government is identified as the key issue for further growth and development of the agricultural sector in North Macedonia. The proposed model can be easily adopted and applied to other countries to screen and evaluate agricultural development. The study informs main policymakers on how to approach the challenges of the regional economy and to improve the country's agricultural outlook.

Keywords: rural economy, development, factors, perception, structural equation modeling, North Macedonia

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Апстракт: Улогата на земјоделството во поширокиот развоен процес е доволно истражена, но без посебен фокус на директните и индиректните врски меѓу факторите земајќи го предвид влијанието на деловното опкружување врз регионалната економија. Овој труд го истражува мислењето на менаџерите на земјоделските компании во Северна Македонија во однос на статусот, перспективите и предизвиците за земјоделството во рамките на регионалната економија кога се соработува со Албанија, Србија и Црна Гора. Применета е сеопфатна методологија во пет чекори со цел проценка на факторите на влијание кога се работи за добрите и лошите страни на развојот на земјоделството. Овие чекори опфаќаат преглед на литература, креирање теоретски модел, прибирање податоци, анализа на елементите и моделирање со структурни равенки. Претпоставени се три директни и две индиректни врски за конструирање на модел кој ги мери влијанијата на деловното опкружување кое е од суштинско значење за регионалната економија. Највисока значајност е пронајдена кај директната врска со КОВИД-19, проследен со силна негативна директна врска од руско-украинската криза, и среден директен ефект од владината поддршка. Дополнително, посочени се екстремно силни индиректни врски на руско-украинската криза и КОВИД-19 со регионалната економија. Така, мерките и активностите за поддршка кои ги дава владата се идентификувани како клучно прашање за понатамошен раст и развој на земјоделскиот сектор во Северна Македонија. Предложениот модел може лесно да се усвои и да се примени во други земји за следење и евалуација на развојот на земјоделството. Истражувањето ги информира главните креатори на политики за тоа како да им пристапат на предизвиците на регионалната економија и да ја подобрат позицијата на земјоделството во земјата.

Клучни зборови: рурална економија, развој, фактори, перцепција, моделирање со структурни равенки, Северна Македонија

Highlights

- A four-factor model quantifying the impacts of the business environment on agricultural, and food processing companies in North Macedonia.
- Managerial perception regarding the status, prospects, and challenges for agriculture within the regional economy.
- The strongest direct path of COVID-19, followed by a strong negative direct connection to the Russia-Ukraine crisis, and a medium direct effect of governmental support.
- The Russia-Ukraine crisis and COVID-19 have extremely strong indirect connections to the regional economy.
- The information of policymakers on how to improve the country's agricultural policy.

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1. Introduction

Agriculture is commonly seen as a crucial sector in producing the necessary products for human existence and a healthy life. Agricultural development must meet few fundamental dimensions: to enable sufficient quantity of food, to have enough resources to regularly produce food, to implement know-how for reasonable food production, and to maintain stable availability of food (Brankov & Matkovski, 2022; Ericksen, 2008). Defining the role of agriculture in the macro-perspective is critical to identifying the relationship between the agricultural sector and the rest of the economy (Barrett et al., 2010). It provides policymakers with strategic challenges and opportunities for agricultural policy design and development. On the other hand, the micro perspective reveals that, unlike industrial agriculture, traditional still remains the main source of many rural areas among permanent residents (Terzić et al., 2020), specifically for small economies like North Macedonia and its neighboring countries. Food production is still very important for small developing countries, and thus agriculture is a determinant of their growth and development. By increasing productivity, agriculture as a basic element that connects society with nature, enables stable and sustainable development of any economy (Petrevska et al., 2023).

While it is important to focus on the macro-growth dimension of agricultural development, it has become clear that structural transformation and regional cooperation are the only sustainable pathways for less-developed countries. Such an approach significantly assisted in understanding the insights of the fundamental process of development of the rural economy. This means paying focus to recognizing the importance of agriculture when determining a country's pattern of growth. To this, one must add the importance of boosting agricultural transformation essential to overall economic development, simultaneously with the key role that agriculture plays in stimulating the nonagricultural economy (Timmer, 2002). This feedback has sparked a long-standing debate in the literature on the role of agriculture in economic development (Johnston & Mellor, 1961; Hayami & Ruttan, 1971; Mundlak, 2000; Timmer, 2002 and 2009).

The study contributes to the state-of-the-art by exploring the perception of owners and managers of agricultural companies on the status and challenges within the regional economic environment. It proposes a conceptual model that quantifies the impacts of the business environment in terms of COVID-19 effects, the Russia-Ukraine conflict's negative repercussions, and governmental measures for supporting and boosting business. The case of North Macedonia is discussed as an example of a country that has faced challenges due to restrictive measures, leading to reduced placements, difficulties in procuring raw materials and fertilizers, increased operating costs, and decreased income. To cope with the pandemic crisis, many companies in North Macedonia used state economic measures, such as payment of 230 EUR per employee for April and May 2020, favorable loans from the Macedonian Bank for development support, and annual leave until May 2020. However, soon after recovering from the pandemic, the Russia-Ukraine conflict made a major impact on agricultural and food exports, causing an increase in the price of electricity and oil, market closure, and shortages of fundamental agricultural products such as wheat, sunflower, and corn, resulting in significant setbacks for the agricultural sector. Higher prices were particularly pronounced in the perishable and labor-intensive subsectors. This includes

fresh produce and meat processing, where disruptions in the supply chain, labor shortages, and increased transportation costs contributed to setbacks.

The study fills the theoretical gap by drawing attention to the necessity of supporting agricultural development in the context of a broader regional economy. The paper is structured as follows: after the introduction, the next section offers a brief literature review on the general role of agriculture and the main challenges arising from the turbulent environment. The methodology, data and research questions are all presented in the methodological framework section. Finally, the results are discussed followed by the research limitations and the future research directions.

2. Literature review

Agriculture has been a key sector affected by various crises and pandemics throughout history. Many key studies highlight the role of agriculture and its development in turbulent environments (globalization, climate change, pandemics, political instability, conflicts, etc.).

A number of studies discuss agriculture's role from various aspects offering a variety of interpretations, such as the demand-based approach (Mattas & Shrestha, 1989; Tzouvelekas & Mattas, 1999), investment stimulus approach (Mattas & Pagoulatos, 1990), effects of agricultural exports (Bairak & Hughes, 1996; Hughes & Litz, 1996), indirect effects of agriculture (Baumol & Wolff, 1994; Hamilton et al., 1991), etc. One is purely agreeable that over the years, agriculture's role has changed over time, starting with getting the economy moving (Mosher, 1966), then supporting economic growth through a variety of linkages (Johnston & Mellor, 1961), even getting to the point where rising agricultural incomes lag behind those in a rapidly expanding nonfarm economy causing political tensions (Schultz, 1978), and finally, fully integrating the agricultural economy through labor and financial markets (Johnson, 1997; Gardner 2002).

Several research looks at how agriculture may support the establishment of an integrated regional economy. There has been a proliferation of research suggesting that agriculture has a significant role in driving growth and development (Beckman & Countryman, 2021; Bournaris et al., 2016; Erol et al., 2011; Loizou et al., 2019; Mattas & Loizou, 2017; Wu et al., 2012), especially when it comes to economic sustainability (Johnston & Mellor, 1961).

In addition, plenty is discussed on the turbulent business environment and the effects on agriculture generally by arguing the global economic crises (Apostolidou et al., 2015; Erol et al., 2011; Krugman, 2013), the functioning of the world markets and distortions (Blandford & Hill, 2006; Brankov & Matkovski, 2022), etc.

Among the most extensive was the attention that COVID-19 had to the agricultural sector. Due to broken supply chains throughout the world, several nations implemented export limits to protect their local food supplies (Casey & Cimino-Isaacs, 2020; IFPRI, 2020) and concentrated on ensuring global food security (Beackman et al., 2021; Torero, 2020). The cascading impact of the COVID-19 pandemic provoked panic buying as a natural human reaction to a stressful scenario (Hall et al., 2021; Taylor, 2021) being a threat to the stability of the food system (Wang et al., 2020; Wang & Na, 2020). While Beckman & Countryman (2021) found agricultural production/trade markets to be very resilient during the pandemic with no substantial larger effect on the overall U.S. economy, some scholars found the opposite. Weersink et al. (2020), and Bellany and Corkery (2020) evidenced that in the US and Canada, overstocked milk, vegetables, livestock, and poultry were either dumped or destroyed. Studies focusing more on logistics and distribution (Gray, 2020; Reardon & Swinnen, 2020; Reardon et al., 2020) and less on agricultural productivity usually notice the detrimental consequences of the pandemics. Pu and Zhong (2020), who addressed the implications in China as well as the government actions to lessen the negative effects, took the investigation a step further. They raised a number of significant concerns for emerging nations and came to the conclusion that safeguarding agricultural productivity is essential to ensuring food security. In contrast, Mizik (2021) found that Hungary exhibited distinct economic outcomes during the COVID-19 pandemic, despite stringent lockdown measures. This divergence was notable when compared to the global financial crisis of 2008 and the sanctions imposed on Russia in 2014. Notably, Hungary

experienced an expansion in its exports, leading to a rising trade surplus. Remarkably, international commodity prices remained stable, even in the face of transportation challenges (Mizik, 2021).

The influence of the Russia-Ukraine conflict on the global grain market, food shortages, and food prices has been the subject of several recent studies. According to Lin et al. (2023), the impact of this conflict on the price of agricultural inputs, notably oil, natural gas, and fertilizers, will have a negative impact on many countries and lead to an increase in world food insecurity. Especially, population displacement, damaged infrastructures, and limits on the free movement of people and products would cause disruption to agricultural output and global trade, destroying the processes of crop cultivation, harvesting, and selling.

The war crisis induced significant stock destructions and export restrictions, which had devastating effects on global food markets and put the world's food security in danger (Abay et al., 2023; Bentley, 2022; Ben Hassen & El Bilali, 2022; de Gourcuff et al., 2023). In particular, the conflict had direct cascade effects on global food security in general by halting exports, creating labour shortages as a result of population relocation, limiting access to fertilizers, and resulting in unpredictable harvests, among other things (WFP, online).

Overall, the scholars highlight the crucial role of agriculture in promoting economic development, food security, and resilience in the face of crises and pandemics. They emphasize the need for sustainable and equitable agricultural practices that can adapt to changing environments and support the livelihoods of farmers and communities.

3. Methodological framework

A five-stage methodology was applied (Table 1).

Tab 1. Research stages. Source: own elaboration

Literature review	Theoretical model	Data collecting	Principal Component Analysis (PCA)	Structural Equation Modelling (SEM)
STAGES				
1	2	3	4	5

In the first stage, a qualitative approach was adopted, which involved a review of the literature.

In the second stage, a scientific research strategy (Martin, 2010) was used to apply the theoretical model (Fig. 1), which constrained two research questions in terms of hypotheses (H) assuming direct and indirect impacts on the regional economy. The main idea was to explore the perceptions of owners and managers of companies active in agriculture by assessing their opinions on the status and main challenges of their companies within the regional economic environment. The first hypothesis H1, which considers three variables' direct effects, claims that COVID-19 (H1a), governmental support (H1b) and Russia-Ukraine crisis (H1c), all have a direct impact on the regional economy. The second hypothesis H2 claims that governmental support has an indirect effect on the regional economy through COVID-19 (H2a) and through Russia-Ukraine crisis (H2b).

In the third stage, data was collected from a survey conducted in December 2022 among decision-makers (owners and managers) of agricultural and processing companies in North Macedonia being regionally export/import oriented. A questionnaire was developed encompassing perceptions related to the current status, problems, and challenges of agriculture within the regional economy and development. Two university professors independently evaluated the questionnaire's validity, comprehensiveness, and readability, allowing the statements to suit the data well.

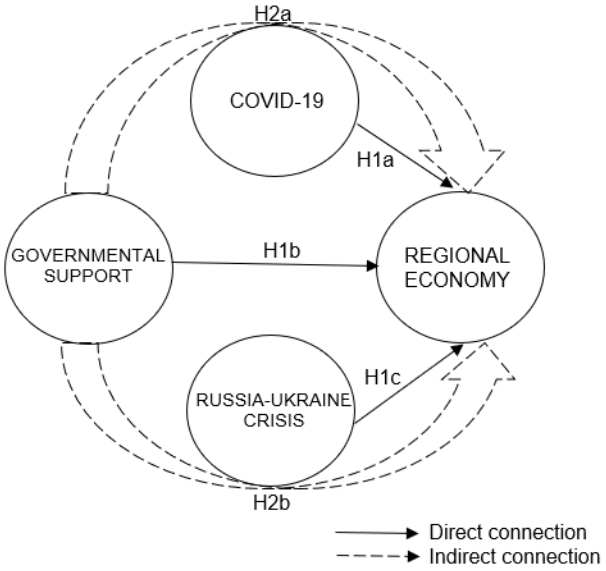

Fig 1. Theoretical model. Source: own elaboration

A fixed-choice self-administered questionnaire with a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) was used, along with several statements provoking direct yes/no answers. The questionnaire was distributed through e-mail addresses obtained by the National Chamber of Commerce, making use of online asynchronous data gathering as a practical replacement for in-person and telephone data collecting (Meho, 2006). A follow-up message was sent to the respondents as a kind reminder following the three-day notice period. A total of 157 acceptable answers were gathered out of 250 identified potential respondents (63%). The questionnaire was structured in three parts:

- Section 1: Perception of the regional economy in terms of agricultural development.
- Section 2: Business in turbulent environment (questions related to COVID-19 and Russia-Ukraine crisis).
- Section 3: General data (Table 2).

Tab 2. Descriptive statistics of the sample (n = 157). Source: own elaboration

Item	No.
Area of business according to the national classification of activities (NKD Rev. 2, State Statistical Office)	
Company doing business in processing (production of meat and meat products, production of fruit and vegetables, production of dairy products, bakery products and pasta, production of drinks)	110
Company doing business in trade	47
Position of the respondent	
Owner	60
General manager/manager	87
Other	10
Number of employees in the company	
Micro (less than 10)	13
Small (10–50)	85
Medium (51–249)	42
Large (250+)	17
Annual turnover of the company	
Up to 2 mil. EUR (micro)	22
2–10 mil. EUR (small)	55
10–50 mil. EUR (medium)	56
Over 50 mil. EUR (large)	24
Company's working experience	
Up to 10 years	8
11–20 years	36
20+	113

Based on Table 2, it may be concluded that the sample included 30% of businesses engaged in trade, 70% of businesses engaged in processing (producing meat and meat products, fruit and vegetables, dairy products, bakery products, pasta, and drinks), and more than half of the businesses were small in terms of employees (having between 10 and 50 employees). Equally, nearly a third of the companies were classified as small in terms of turnover (between 2–10 million EUR) and medium (between 10 and 50 mil EUR). More than half respondents were general managers or managers (56%), and slightly more than a third were owners (38%). 72% of the selected companies have been in business for more than 20 years.

In the fourth stage of the research, Principal Component Analysis (PCA) was undertaken in SPSS, as well as Oblimin rotation, to account for any factor connection.

In the fifth stage, AMOS software was used for Structural Equation Modelling (SEM). Many items were excluded and linkages from the model were removed based on low inter-item and item-to-total correlations on the one hand, and overly high correlations with variables from other factors on the other (Hair et al., 2010). The model only includes variables that have a sufficient level of internal consistency representing the relationships and critical paths between the factors.

4. Results

The PCA identified four influential factors (Table 3) presented by paraphrased questions in the form of statements. The context of regional countries refers to Albania, Serbia, and Montenegro.

Tab 3. Factors and PCA results. Source: own elaboration

Factor (F)	Loading/Cr Alpha	Mean	Std. Deviation	Std. Error Mean	t	Sig. (2-tailed)
F1: COVID-19	0.832	2.538				
Q16: Substantial profit decrease	0.832	2.120	0.96974	0.077	14.576	0.000
Q27: Negative consequences to product demand	0.926	1.439	0.49791	0.040	15.742	0.000
Q39: The Company's trade decrease in general	0.934	3.382	2.00171	0.159	16.107	0.000
Q40: The Company's trade decrease with regional countries	0.634	3.210	2.01606	0.161	11.892	0.000
F2: REGIONAL ECONOMY	0.806	1.943				
Q4: Regional trade exchange as an alternative to EU possibilities	0.840	2.420	0.99439	0.079	14.571	0.000
Q18: Presence of obstacles for regional cooperation related to the company's activities	0.720	1.790	0.40875	0.032	11.379	0.000
Q20: Comparing trade conditions to those of 10 years earlier	0.857	1.618	0.85136	0.068	15.231	0.000
F3: GOVERNMENTAL SUPPORT	0.815	2.219				
Q14a: Subsidy for agricultural products	0.634	1.879	0.32719	0.026	14.551	0.000
Q14b: Subsidy for processing capacities	0.992	1.733	0.44408	0.035	10.139	0.000
Q14c: Subsidy for trade	0.991	1.739	0.44067	0.035	10.134	0.000
Q15: Satisfaction of the form and amount of state subsidy	0.685	3.917	1.49770	0.119	7.686	0.000
Q33: State economic measures to mitigate COVID-19 crisis	0.773	1.828	0.37857	0.030	8.465	0.000
F4: RUSSIA-UKRAINE CRISIS	0.716	2.702				
Q17: Significant profit decrease	0.624	1.9045	1.04871	0.084	6.954	0.000
Q28: Consequences to demand for agricultural/dairy/meat products	0.673	1.5478	0.49931	0.039	7.315	0.000
Q31: Type of problems	0.445	3.2166	1.19999	0.095	5.145	0.000
Q41: Extent to product decrease	0.928	3.4395	1.99788	0.159	9.254	0.000
Q42: Extend to trade decrease	0.912	3.4013	2.03451	0.162	9.146	0.000

Extraction method: PCA; Rotation method: Oblimin with Kaiser Normalization; Statistically significant at the 1% level.

The mean overall Cronbach's alpha value of the indicators is 0.79, which is above the suggested benchmark of 0.6 (Nunnally & Bernstein, 1994). The Kaiser-Meyer-Olkin Measure of Sampling Adequacy is 0.709 being classified as middling (Kaiser, 1974) but close to 0.8, which indicates sampling adequacy. Bartlett's test is highly significant ($p < 0.05$) indicating that the factor analysis is appropriate.

The first identified factor "COVID-19" has a Cronbach's alpha value of 0.832 and consists of four items. The second factor "Regional economy" (0.806) consists of three items. The third factor "Governmental support" has a Cronbach's alpha value of 0.815 and five items, and the last, fourth factor "Russia-Ukraine crisis" (0.716) has five items. The model (Fig. 2) presents the path analyses of the relationships between the endogenous factor "Regional economy" (F2), and three exogenous factors: "COVID-19" (F1), "Governmental support" (F3), and "Russia-Ukraine crisis" (F4). The model confirmed the connections among the impact factors from the theoretical model (Fig. 1).

All constructs in the model are adequately well explained by their respective predictors as suggested by the explained variance. The loadings are larger than 0.5 in all connections between each construct and the questions that make up the construct. Presented data in Figure 2 are from the SEM's model Standardized Values section. The direct path "COVID-19" and the "Regional economy" reflects the most important factor and has the highest significance threshold (1.01). Also, the direct relationship between the "Russia-Ukraine crisis" and the "Regional economy" is strongly unfavorable (-0.72) with a value much above 0.5 suggesting a significant adverse effect. If the assumptions of the model remain the same, as the crisis in Ukraine goes on, it will have a detrimental impact on the overall economy in the region. Both factors, "COVID-19" and "The Russia-Ukraine crisis" have detrimental effects on the operations of agricultural, food production and processing companies in North Macedonia. "Governmental support" is the factor that has the least direct influence with a moderate impact on "Regional economy" (0.53). Governmental actions, on the other hand, are far more strongly indirectly related to the "Regional economy" through "COVID-19" (0.70) and much more through the "Russia-Ukraine crisis" (0.82). Certain countries in the region had specific agreements with the Russian Federation regarding the export of agricultural products.

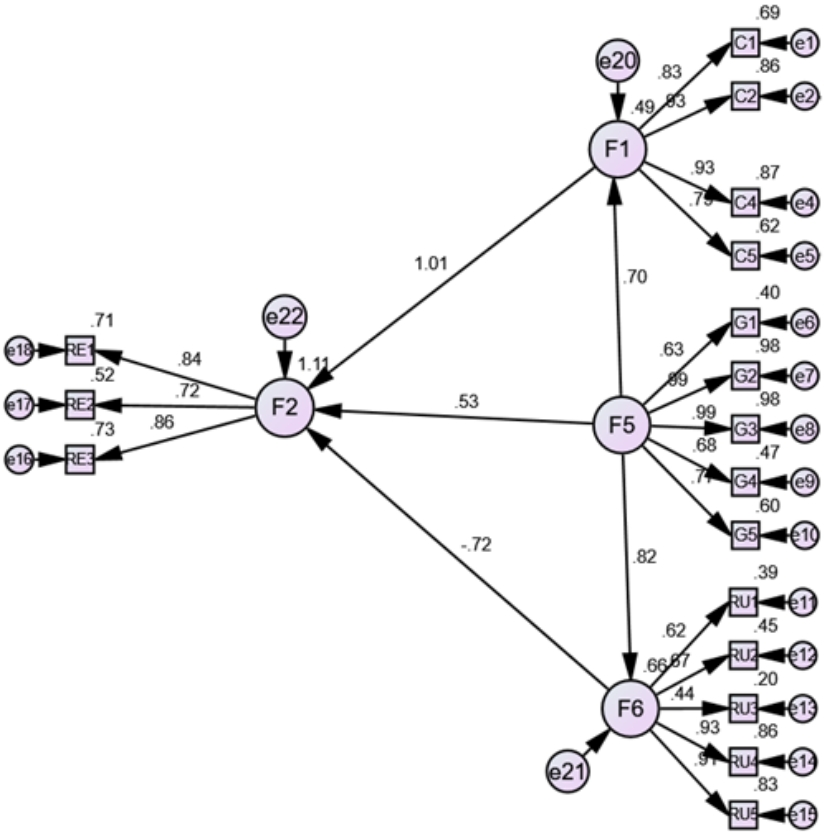

Fig 2. SEM results. Source: own elaboration

As all measurements show a good fit (Table 4), the developed model offers strong support for the links between the constructs and their indicators. In particular, the chi-square is significant, and the ratio χ^2/df has a value that is lower than 5 when compared to the sample size. The errors (RMSEA and SRMR) are just above 0.05, while the CFI and IFI are also over 0.9.

Tab 4. Goodness-of-fit measures. Source: own elaboration

χ^2	p	df	χ^2/df	CFI	IFI	RMSEA	SRMR
474.6	0.000	113	4.2	0.907	0.908	0.058	0.054

5. Discussion

The study identified the key issues that need to be addressed for further growth of agricultural, food production and processing sectors in North Macedonia. Developing and boosting a regional economy with free trade, no customs and border restrictions, is a challenge. Currently, regional cooperation is limited to Serbia, Albania, and Montenegro, as the closest countries in the surrounding area. The study discovered that managers assessed other variables as being more significant causes of impact and rated the "Regional economy" as having the lowest mean score (1.943). This is to be expected since the processes of regional cooperation and development are specifically driven by the support of the countries' governments. These findings support earlier research that emphasized the contribution of agriculture to the economy (Mattas & Loizou, 2017; Wu et al., 2012).

Also, "COVID-19" was found to be the most significant factor (ß=1.01) that directly influences the regional economy in terms of agricultural development (H1a). The managers rated their perception of it as having the second-highest mean value (2.538). Since the mid-March 2020, North Macedonia has been dealing with pandemics that resulted in harsh market limitations, travel restrictions, financial issues, a shortage of seasonal labor, and other factors. Due to reduced working hours and limited movement, the manufacturing activities slowed down, the regular sales channels were closed, the placement was questionable, and there were issues with the purchase. The COVID-19 crisis has exposed flaws and made long-standing issues worse. It also prompted the question of whether North Macedonia, a country dependent on imports, would have enough food.

Furthermore, the study discovered that the "Russia-Ukraine conflict" is a negative global factor (ß = -0.72) that strongly impacted North Macedonia's agriculture sector (H1b), being perceived as having the greatest mean value (2.702). For managers, the chain of global food production was significantly disturbed by the rise in petroleum and fertilizer prices. Export limitations had a major detrimental impact on national and regional grain markets, and North Macedonian agricultural and processing businesses were not exempt.

Hence, "COVID-19" and the "Russia-Ukraine crisis" are the most powerful factors that have a direct and substantial impact on the growth of agriculture in North Macedonia. The profound unfavorable effects were further confirmed when assessing the indirect links between them and the governmental support. The study found that, opposite to the moderate direct influence of policies (H1b, ß = 0.53), government assistance has strong indirect effects on the regional economy through COVID-19 (H2a, ß = 0.70), and even stronger effects through the Russia-Ukraine crisis (H2b, ß = 0.82). Managers perceived the governmental assistance as having a mean value of 2.219, with modest direct but significant indirect effects. This highlights the importance of resilience and adaptive capacity in maintaining agricultural production and processing during times of crisis.

6. Conclusion

Agriculture is one of the most essential sectors of any national economy that has undergone a positive, fundamental transformation over time because of innovations and new technology. Hence, under-developed economies, using a set of measures in the first line of governmental support, highly dependent on a traditional agricultural sector, have gradually transformed into modern and more industrial

production (Barro & Xavier, 2003; Carter, 2004; Robertson & Landon-Lane, 2001; Robertson, 1999). As this was the case with North Macedonia, the study assessed the managerial perception of agricultural companies on the status, prospects, and challenges for agriculture within the regional economy.

The study identified four driving factors of influence when underlying the pros and cons of agricultural development in North Macedonia ("COVID-19", "Regional economy", "Governmental support", and "Russia-Ukraine crisis"). A structural model is constructed by assessing three direct and two indirect effects. The model is fully in line with the theory and hypotheses for investigating the level of influence of the business environment, measured through incentives (governmental support) and inhibitors (COVID-19 and Russia-Ukraine crisis) as perceived by the management of agricultural companies. The model was empirically tested in the case of North Macedonia to evaluate the sector of agriculture and its development in the broader economic context. It may be adopted and applied to other case studies to assist them in improving the growth of agriculture in the regional economy context.

In this line, the study emphasizes the crucial role of governmental support in driving the transformation of the agricultural sector in North Macedonia. This finding suggests that government should prioritize policies and initiatives aimed at supporting and modernizing agriculture, in the first line of policy formulation and capacity building. Specifically, policymakers should formulate and implement supportive measures, such as subsidies, access to credit, and infrastructure development, to facilitate the growth and modernization of agriculture. The government can allocate resources to capacity-building programs designed to empower farmers and agricultural companies with the skills and knowledge required to adopt innovative technologies and sustainable practices.

Regarding the influence of external factors such as the COVID-19 pandemic and the Russia-Ukraine crisis, the study highlights their impact. It underscores the importance of policymakers and the business sector proactively enhancing the resilience of the agricultural sector by developing contingency plans and diversifying supply chains to mitigate future disruptions. Agricultural stakeholders should also monitor and adapt to global geopolitical developments that could potentially affect trade and exports. By diversifying export markets and exploring alternative trading partners, vulnerabilities to such crises can be reduced.

Furthermore, the study highlights additional practical implications for sustainable agriculture, specifically focusing on environmental considerations and resilience to climate change. To this end, the agricultural sector should transition towards sustainable and equitable practices. Policymakers play a crucial role in incentivizing environmentally friendly farming practices, including but not limited to organic farming, reduced chemical usage, and water-efficient irrigation methods. Given the increasing impacts of climate change, investments in climate-resilient crops and practices are essential to ensure long-term productivity and food security.

Both policymakers and the agricultural sector should also prioritize investment opportunities and technology adoption to enhance productivity and competitiveness. Additionally, recognizing the intricate interdependence of agriculture with other sectors of the economy, policymakers should actively promote collaboration and synergy between agriculture and related industries such as food processing and distribution. This collaborative approach can foster a more integrated and resilient economic ecosystem.

Finally, this research provides valuable insights into the transformation of the agricultural sector in North Macedonia with practical implications extending far beyond the region. By concentrating on areas such as governmental support, sustainability, resilience, investment, and fostering interconnectedness, stakeholders can contribute significantly to the growth and modernization of agriculture. Ultimately, this will have a positive impact not only on the national economy but also on global food security.

7. Limitations and future work

There are a few gaps in the study that might be filled in by future research. The first drawback is that other aspects of perception are missing because the emphasis is solely on management (example: policymakers, consumers, etc.). Secondly, the research may suffer from the common method variance effect due to

the questionnaire-based nature of the data. Thirdly, because the research only included a small number of variables, the model might benefit from including additional information about the regional economy and growth, including collaboration, technology, innovation, and even more direct connections to governmental policies. Fourthly, because the elaboration is based on a real case study, there is a chance that the research's findings and conclusions will be overgeneralized. So, future research may potentially focus on a combined methodological approach (Sharpley, 2014). Finally, future work may include a multifunctional and interdisciplinary approach to developing integrated policies and strategy documents for agricultural growth. Yet, these limitations do not lessen the value of the findings; rather, they offer some general suggestions for future research.

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