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A SWOT Analysis of Organizations in the Agri-Food Chain Sector from the Northern Region of Portugal Using the PESTEL and MEETHS Frameworks

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Abstract: Research on modern agri-food chains aims to enhance flexibility by analyzing supply chain aspects to identify improvement opportunities. A SWOT analysis of 39 agri-food sector organizations using a SWOT analysis organized using the PESTEL and MEETHS categories was conducted to evaluate the stakeholders' needs in this sector of activity in Northern Portugal. Logistic regressions were used to compute inferential statistics, which were complemented with a qualitative analysis. Cooperatives and primary sector companies often claim superior product quality without clear evidence, while corporations integrated into competitive national markets, like those with smoked products, adapt better to dietary trends. Small- and medium-sized enterprises struggle with competitive wages, leading to high turnover and difficulty retaining skilled workers. High costs hinder many organizations, particularly cooperatives, from adopting modern communication technologies affecting competitiveness. Challenges include identifying market opportunities and managing global competition for raw materials, like wild fish. Fishing and meat sectors depend heavily on modern distribution and are dominated by large retailers. Low labor costs boost competitiveness but reflect the struggle to add value. Larger organizations are more optimistic though many face challenges with the cost and volatility of key products, like pork and milk. This study offers the following key recommendations: invest in technology and innovation while balancing short-term gains with long-term sustainability; strengthen strategic planning and collaboration among corporations, cooperatives, associations, and academic institutions; and adapt to regulatory changes, invest in market and technological capabilities, and address resource limitations. Research and collaboration with policymakers and academic institutions will support tailored solutions, enabling the sector to anticipate challenges and capitalize on opportunities.

Keywords: agri-food chain; SWOT analysis; Northern Portugal; recommendations; sectors of activity; stakeholders; types of organizations

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1. Introduction

The SWOT analysis is a widely used diagnostic tool for identifying factors affecting organizational success or failure, emphasizing the importance of considering both internal and external [1]. It provides a robust framework for decision making and strategic planning by thoroughly examining internal and external factors influencing organizations [2].

A SWOT analysis helps organizations identify internal strengths and weaknesses, as well as external opportunities and threats. This method offers a structured approach to evaluating the strategic balance of an enterprise, particularly in the agri-food sector, and it

has been used in similar studies [3–6]. By understanding and aligning internal capabilities with the external environment, agri-food enterprises can improve their competitiveness and strategic positioning. Matching internal and external factors enables these companies to leverage strengths to exploit opportunities, mitigate weaknesses to reduce threats, convert weaknesses into strengths, and use strengths to counteract threats [7–9]. Systematically applying SWOT analysis allows agri-food enterprises to make informed decisions, optimize resource allocation, and enhance their competitiveness in the marketplace.

For agri-food chain organizations, key competitive factors commonly identified as strengths or weaknesses are grouped into six major categories: *market*, *endogenous resources*, *economic and financial*, *technology*, *human capital*, and *support structures* (MEETHS) [10–18].

In the pursuit of maximizing profitability and sustainability, a SWOT analysis enables organizations to align their strategies with their core competencies and market dynamics. This alignment helps optimize resource allocation, improve performance, and enhance overall profitability while promoting long-term sustainability [2]. By conducting a SWOT analysis, entrepreneurs can focus on the most significant factors limiting their company's productivity, identifying constraints and problems. This process highlights areas needing further research [19]. Categorizing variables into one of the four SWOT quadrants can be challenging, as certain factors may fit into more than one quadrant. This categorization is dynamic, as strengths and weaknesses can evolve [20].

1.1. Internal Forces of Agri-Food Chain Organizations

The MEETHS framework identifies six major areas determining an organization's strengths and weaknesses: *market*, *endogenous resources*, *economy and finance*, *technology*, *human capital*, and *support structures*. These categories cover various factors that influence organizational performance and strategic decisions of an organization. Figure 1 illustrates the MEETHS classification.

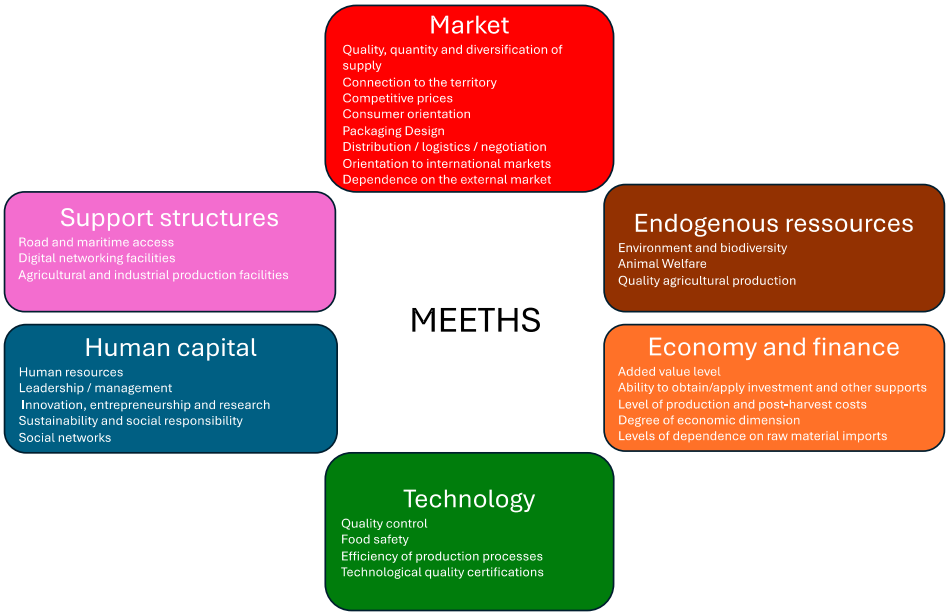

Figure 1. The making of a MEETHS analysis. Source: the authors.

Market intelligence and consumer insights focus on understanding market trends and consumer preferences through research. This helps the agri-food sector anticipate and adapt to shifting market dynamics, ensuring alignment with consumer expectations [21].

Combining traditional innovation is a significant strength in the agri-food sector [14]. Products rooted in local territories often have added value, as they meet consumers' desires for authenticity [22]. Internationalization is another crucial strategic area. This involves expanding market reach by improving access to logistics and distribution networks and enhancing product promotion [23]. *Endogenous resources* are linked to sustainable agricultural practices and eco-friendly initiatives [24]. Quality agricultural production leverages the valorization of endogenous resources and the promotion of biodiversity, making them more attractive to environmentally conscious consumers [25].

Economic and financial aspects are central to the agri-food sector's success. The concept of added value refers to the enhancement a product receives from its initial raw state through various stages of production, processing, and distribution until it reaches the consumer [15]. Small-scale operations often struggle with high production costs, as they cannot benefit from economies of scale. Therefore, strategies that enhance scale, efficiency, and market access are essential for reducing costs and ensuring the viability of small businesses [24]. Additionally, a trade deficit, where imports exceed exports, can create economic challenges by increasing reliance on imported raw materials, which can raise production costs and destabilize the economy [9]. Access to investment and financing is also critical. These financial resources are necessary for innovation, improving operational efficiencies, and maintaining competitiveness in a rapidly evolving market [9,17].

Technology integration in the agri-food industry promotes food safety and quality. Innovations in traceability, predictive analytics, automation, digital certification, and biotechnology enhance transparency, efficiency, and consumer trust. These advancements help organizations to comply with global food safety standards while improving their market position [16]. However, some agri-food businesses, especially those in niche areas, like organic farming or artisanal production, may find automation challenging due to their reliance on manual labor and traditional methods [26].

Human resources (HR) are crucial in driving innovation and growth in the agri-food sector [27]. This sector requires a diverse range of skills, from agricultural science and food technology to marketing and logistics [17]. Effective HR practices attract and retain talent, fostering innovation and entrepreneurship [28]. Companies that invest in digitalization and skilled HR can improve efficiency, market reach, and customer satisfaction [8]. Sustainability and social responsibility are contemporary issues, especially relevant and valued in agri-food products, and associated with green consumption and animal welfare [29].

Leadership and management *support structures* are vital for building a resilient and high-performing workforce. Collaborative networks, such as shared information platforms and joint marketing initiatives, improve communication and adaptability across the agri-food chain. Proximity to transportation infrastructure is also crucial for managing perishable products, making it a key competitive factor [18].

1.2. External Forces of the Agri-Food Chain Organizations

The external forces of the macro-environment of agri-food organizations were classified according to PESTEL analysis and were thus grouped into six major factor categories: *political*, *economic*, *social*, *technological*, *environmental*, and *legal*. Figure 2 illustrates the PESTEL classification.

The *political factors* encompass government policies, political stability, and developments that impact businesses. In the Portuguese agri-food sector, these factors are significant because the sector is crucial to the economy, playing a crucial role in domestic supply and exports. Various investment support measures funded by the Portuguese government, the European Union, and other entities aim to promote innovation, sustainability, and competitiveness [30]. European regulations, particularly those concerning *protected designation of origin* (PDO), play a crucial role in safeguarding regional products supporting economic development, preserving cultural heritage, ensuring product quality, and protecting against imitation [31].

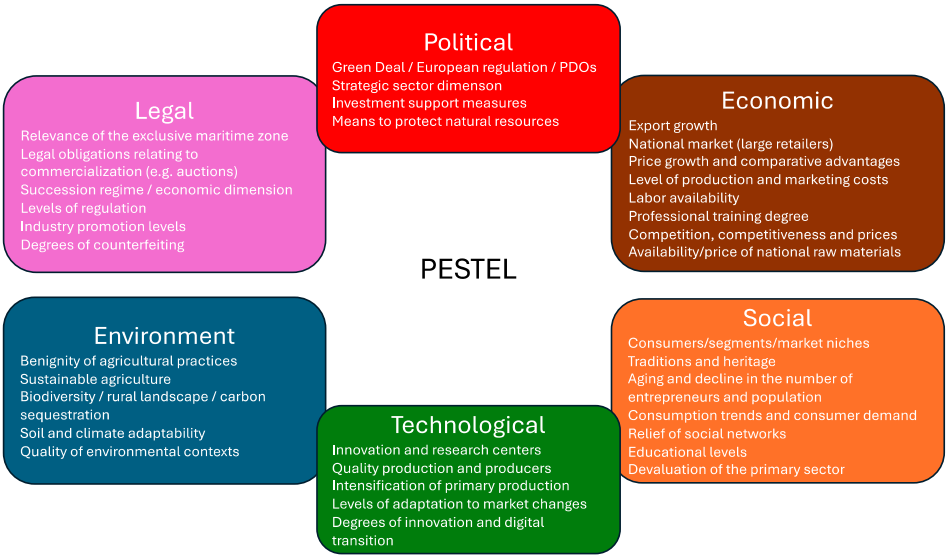

Figure 2. The making of a PESTEL analysis. Source: the authors.

Economic factors have driven the evolution of the Portuguese agri-food sector, which has established comparative advantages. Large-scale distribution has been a major driver of innovation and product development, leading to increased market competitiveness and diversification [32]. However, challenges remain, such as the lack of coordination between production and processing, scarcity, and high cost of domestic raw materials, along with labor shortages. These issues contribute to rising production costs, which can erode profit margins and reduce competitiveness [32,33].

Social factors influence businesses by shaping customer behaviors and societal trends. Understanding these trends enables food companies to innovate and stand out in a competitive market. They can tailor their products and marketing strategies to meet the demands of modern consumers [34]. Social networks play a pivotal role in shaping food consumption behaviors and trends, allowing businesses to enhance their visibility and respond quickly to changing preferences [35].

Technological factors in the agri-food sector involve the influence of technological advancements on efficiency, product development, food safety, and consumer satisfaction. While technology is essential for the food industry's adaptation and success, the digital transition in food production and processing faces constraints that slow development and market adaptation [36,37].

Environmental factors focus on ecological considerations, like biodiversity, rural landscape, and sustainable agricultural practices, which are crucial for differentiating the agri-food sector and strengthening the value chain [36].

Legal factors involve stringent regulations governing the agri-food industry, reflecting the importance of food safety, quality, and sustainability. These regulations cover the entire process from production to distribution ensuring that agricultural products meet high standards, which is particularly crucial for economies like Portugal's, where agriculture and maritime resources play significant roles [37].

1.3. Objectives and Aim of This Study

Our research focuses on enhancing the flexibility and adaptability of modern agri-food chains to better meet the needs of stakeholders in Northern Portugal. The primary objective is to examine various aspects of the supply chain to identify opportunities for improvement. By analyzing these factors, we reach the second objective of providing insights into how the industry can develop strategies to enhance competitiveness, adapt to market changes, and achieve sustainable growth. This report presents our findings and insights aiming to help businesses align their objectives with the economic and social contexts in which they operate while also identifying research opportunities and needs.

2. Materials and Methods

2.1. Collection of Data

From $N = 60$ organizations initially contacted personally, we received $N = 39$ answers that make our sample of organizations from the agri-food sector in Northern Portugal. The interviewees were initially contacted by phone and asked to participate in this study. After agreeing to collaborate, they were sent the questionnaire via email, which they completed and returned by email as well. The survey consisted of a SWOT analysis with two questions: What are the strengths and weaknesses of this activity/sector of the agri-food economy, particularly in the Northern region? What are the opportunities and threats of this activity/sector of the agri-food economy, particularly in the Northern region? A diversity of organizations from the three *sectors of activity* (*primary* $n = 10$, *secondary* $n = 23$, and *tertiary* $n = 6$) were sampled and included the areas of activity with higher relevance in Northern Portugal: meat, fish, horticulture, dairy, wine, agriculture others, and others. Three different *types of organizations* were considered: = 25, *cooperatives* $n = 5$, and *associations* $n = 9$. The sampling method was convenience sampling, as most organizations collaborated with us in research projects and student placements, while others were selected based on their importance within the region, guaranteeing a minimum of 5 samples per area of activity.

In the context of the agri-food chain, the primary sector involves the production of food and fishing activity. The secondary sector focuses on transforming raw materials, obtained by the primary sector, into finished goods through manufacturing. The tertiary sector includes the provision of services, including retail, facilitating the distribution of food, and supporting the primary and secondary sectors of the agri-food chain.

Also, in the context of our study, corporations are defined as private unipersonal, quota, or shareholding societies. Cooperatives are organizations owned and controlled by people or companies entering the organization as partners with equal rights of 1 vote in the governance of the cooperative to meet their common economic, social, and/or cultural needs and aspirations through a jointly owned and democratically controlled business. Associations are organizations owned and controlled by people and or companies; however, they are different from cooperatives, as these do not have economic activity in the sense of buying or selling goods or services for profit. Associations aim to lobby for the interests of a sector of activity with legislators or government officials, such as regulatory agencies or the judiciary.

The *opportunities* and *threats* of the SWOT analysis were analyzed by dissecting the answers provided according to the PESTEL model. The *strengths* and *weaknesses* of the SWOT analysis were analyzed by dissecting the answers provided according to a self-designed unit of analysis (MEETHS, standing for *markets*, *endogenous resources*, *economic–financial resources*, *technological resources*, *human resources*, and *supporting structures*).

The text entered by the interviewees, while answering the SWOT analysis, was then analyzed and included in sub-units of analysis both in the PESTEL and the MEETHS models.

The interview results were systematically coded using specific frameworks for analyzing the macro-environment and micro-environment. Each of the six variables in the PESTEL analysis (*political*, *economic*, *social*, *technological*, *environmental*, and *legal*) had a set of alphanumeric codes representing different aspects of the variable. For example, under the political category, we had codes for government policy, trade restrictions, or investment support measures. In the micro-environment analysis, each of the MEETHS variables (*market*, *endogenous resources*, *economic and financial*, *technology*, *human capital*, and *support structures*) also had a set of alphanumeric codes specific to the aspects being analyzed. For instance, under market, we defined codes for analyzing consumer trends, orientation towards internationalization, etc. This structured approach helps ensure that the analysis is comprehensive and that key environmental factors are systematically considered. Data were arranged in an Excel sheet, and the following variables were considered. The analysis of the qualitative information provided within the questionnaires was used to enter the data in the Excel sheet. The organizations were divided by *sector of activity* (*primary*, *sec-*

ondary, and *tertiary*), *type of organization* (*corporations*, *associations*, and *cooperatives*), and *area of activity* (*meat*, *fish*, *horticulture*, *dairy*, *wine*, *agriculture others*, and *others*). All the units in the PESTEL and MEETHS analyses were also entered as dichotomic variables, depending on whether the organization had identified any pertinent aspect in their answers.

2.2. Data Analysis

A mixed methods strategy (quantitative and qualitative) was used to analyze the data. In the first step, data were analyzed quantitively by the production of descriptive and inferential statistics. In the second step, qualitative information provided by the interviewees was used to justify the results obtained with the statistical analysis.

The inferential statistics were produced using logistic regression models, where either the *sector of activity* or the *type of organization* were used as independent variables to assess any eventual significant differences between these. As dependent variables, several models were tested using the dichotomic variables derived from the PESTEL and the MEETHS units of analysis.

The descriptive statistics and graphs were produced using Microsoft® Excel® for Microsoft 365 MSO (version 2204 Build 16. 0. 15128. 20240) 64 bit. The inferential statistics were produced using the Generalized Linear Models routine of the statistical package IBM Corp.® SPSS® Statistics, Armonk, NY, USA. Version: 29.0.0.0 (241).

3. Results

This study analyzes the answers of those responsible for a wide range of organizations involved in the production and transformation of agri-food products, as well as organizations representing the sector, which are both in the Northern region of Portugal. Meat, fresh fruits and vegetables, jams, dairy, sea fish and aquaculture, wine and beer, olive oil, dried fruits, and aromatic plants form the set of products considered. Figure 3 identifies the number of companies that in the *opportunities* item of the SWOT analysis signaled PESTEL variables. According to the data, economic and social issues dominate, having been flagged 48 times by organizations (55.8%) as being those in which greater opportunities prevail.

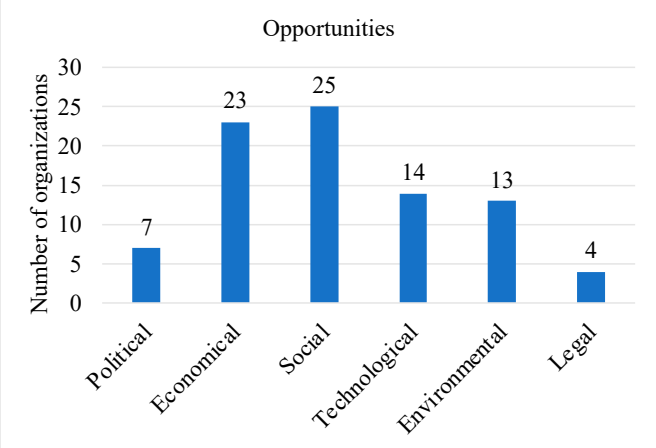

Figure 3. SWOT analysis made to the organization part of the present study. The number of organizations identifying the different units of the PESTEL analysis for opportunities. Source: the authors.

Analyzing in more detail, it is the great dynamics and mutations identified at the consumer level and their different forms of segmentation and positioning during the recent years that seem to provide the most opportunities for the agri-food sector in the region of Northern Portugal. Not far from the social aspects are also the economic aspects. In these, the organizations surveyed highlight the significant relevance of the region's growing export potential as a vehicle for economic growth.

Figure 4 presents the typology of dominant threats, identified by respondents. By far, it is the economic aspects that prevail, followed by threats related to social and legal issues. Within the scope of economic aspects, we can identify three dominant sub-categories that are very close in terms of their relative weight: increasing competition; lack of labor and insufficient qualified labor; and increased production and marketing costs.

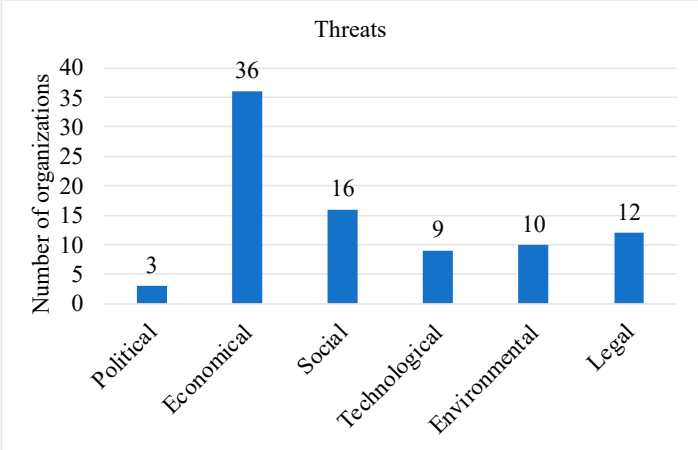

Figure 4. SWOT analysis made to the organization part of the present study. The number of organizations identifying the different units of the PESTEL analysis for *threats*. Source: the authors.

The weaknesses are shown in Figure 5, which is presented below. Unlike the remaining three figures, in the case of weaknesses, no item stands out. Indeed, the self-designed MEETHS unit of analysis identifies three parameters with close relative weights: economic–financial; human resources; and markets. Within the economic factors, aspects related to the reduced and/or inadequate economic size of companies, whether in the primary or secondary sector, largely dominate.

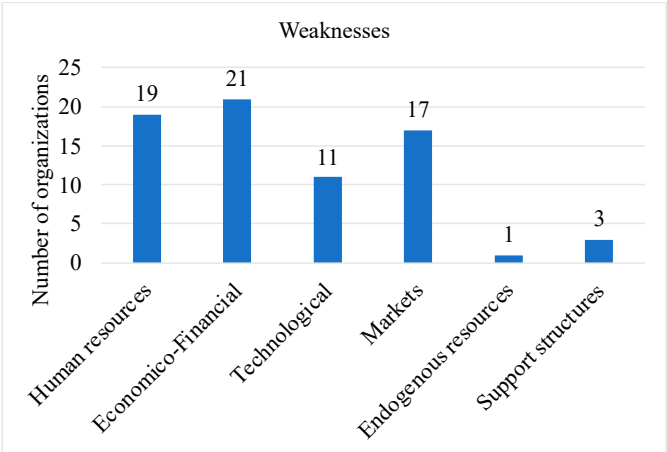

Figure 5. SWOT analysis made to the organization part of the present study. The number of organizations identifying the different units of the MEETHS analysis for *weaknesses*. Source: the authors.

Regarding human resources, more detailed information highlights the lack of quality human capital, which provides, through knowledge, added value to production. The markets are positioned in third place in the ranking of weaknesses. Within these, unfavorable distribution, logistics, and negotiation indices constitute the most preponderant aspects of conditioning.

Regarding the strengths (Figure 6), the MEETHS analysis places the market item in great prominence (almost 72% of the organizations surveyed highlighted this aspect). However, a more detailed analysis reveals that these are essentially issues related to the quality and quantity of products made available to the market. In other words, markets are sensitive and open to products with high intrinsic quality and a high degree of availability produced in Northern Portugal.

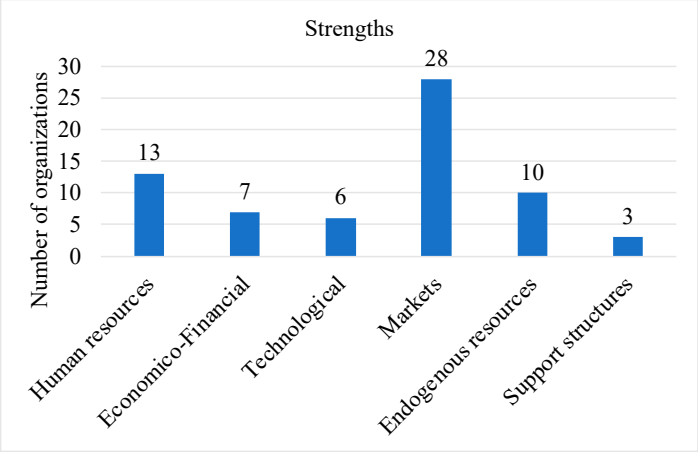

Figure 6. SWOT analysis made to the organization part of the present study. The number of organizations identifying the different units of the MEETHS analysis for *strengths*. Source: the authors.

Despite the significant distance from the first item, the connection to the territory (legacy and heritage), as a market factor, is also an aspect considered a strength of the sector. This means that the agri-food sector can place products on the market with a strong cultural identity, which is particularly appreciated domestically and abroad.

In Table 1, we can find the parameters of the models that were found to be significant while using logistic regressions to model the probability of an organization having identified a particular unit of analysis from the PESTEL and MEETHS models' function of the *type of organization* and *sector of activity*.

Table 1. Models found to be significant while using the units of the PESTEL and MEETHS analyses as dependent variables in logistic regressions. As independent variables, we used the *type of organization* and *sector of activity*. The models not represented in the table were not found to be significant or did not converge.

Dependent Variable	Model	Parameter	Estimate	OR
Strengths, Economic–Financial	Type of organization	Corporation	1.435 **	4.200
Strengths, Economic–Financial	Sector of activity	Secondary	1.558 **	4.750
Strengths, Technological	Type of organization	Corporation	1.705 **	5.500
Strengths, Technological	Sector of activity	Secondary	1.281 *	3.600
Strengths, Markets	Sector of activity	Secondary	−1.281 *	0.278
Strengths, Endogenous Resources	Type of organization	Corporation	1.435 **	4.200
Strengths, Endogenous Resources	Sector of activity	Secondary	1.558 **	4.750
Strengths, Endogenous Resources	Type of organization	Corporation	2.037 ***	7.667
Weaknesses, Technological	Sector of activity	Secondary	1.041 *	2.883
Weaknesses, Endogenous Resources	Type of organization	Corporation	3.219 **	25.00
Weaknesses, Support Structures	Type of organization	Corporation	3.219 **	25.00
Weaknesses, Support Structures	Sector of activity	Primary	2.197 *	9.00
		Secondary	2.351 **	10.5

Table 1. *Cont.*

Dependent Variable	Model	Parameter	Estimate	OR
Opportunities, Political	Type of organization	Corporation	2.485 ***	1.250
Opportunities, Political	Sector of activity	Secondary	3.091 **	22.00
Opportunities, Social	Sector of activity	Secondary	−0.087 *	0.917
Opportunities, Environmental	Type of organization	Corporation	0.999 *	2.714
Opportunities, Environmental	Sector of activity	Secondary	1.558 **	4.750
Opportunities, Legal	Type of organization	Corporation	1.099 **	25.00
Threats, Political	Type of organization	Corporation	2.485 ***	12.00
Threats, Political	Sector of activity	Primary	2.197 ***	9.00
		Secondary	2.351 ***	10.5
Threat, Economical	Type of organization	Corporation	−2.485 ***	0.083
Threat, Economical	Sector of activity	Secondary	2.197 **	0.045
Threats, Technological	Type of organization	Corporation	1.435 **	4.200
Threats, Technological	Sector of activity	Primary	2.197 *	9.000
		Secondary	1.281 *	3.600
Threats, Environmental	Sector of activity	Secondary	1.281 *	3.600
Threats, Legal	Type of organization	Corporation	1.705 **	5.500
Threats, Legal	Sector of activity	Secondary	1.558 **	4.750

Notes: PESTEL: political, economic, social, technological, environmental, and legal. MEETHS: markets, economic–financial, endogenous resources, technological, human resources, and supporting structures. OR: Odds Ratio. Significance levels * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$. The probability of an organization having responded positively to the units identified as dependent variables is being modeled, while the opposite is used as a reference. Source: authors' own compilation.

The qualitative interpretation of Table 1 is summarized in Table 2 for the type of organization model and in Table 3 for the sector of activity model.

Table 2. Probability (higher or lower) of the different *types of organizations* identifying the indicated analytical items. Organizations indicated in the same cell do not show significant differences.

Analytical Unit	Higher	Lower
Strengths, Economic–Financial	Corporation	Association, Cooperative
Strengths, Technological	Corporation	Association, Cooperative
Strengths, Endogenous Resources	Corporation	Association, Cooperative
Strengths, Endogenous Resources	Corporation	Association, Cooperative
Weaknesses, Endogenous Resources	Corporation	Association, Cooperative
Weaknesses, Support Structures	Corporation	Association, Cooperative
Opportunities, Political	Corporation	Association, Cooperative
Opportunities, Environmental	Corporation	Association, Cooperative
Opportunities, Legal	Corporation	Association, Cooperative
Threats, Political	Corporation	Association, Cooperative
Threat, Economical	Association, Cooperative	Corporation
Threats, Technological	Corporation	Association, Cooperative
Threats, Legal	Corporation	Association, Cooperative

Source: authors' own compilation.

Table 3. Probability (higher, lower, lowest) of the different *sectors of activity* identifying the indicated analytical items. Organizations indicated in the same cell do not show significant differences.

Analytical Unit	Higher	Lower	Lowest
Strengths, Economic–Financial	Secondary	Primary, Tertiary	
Strengths, Technological	Secondary	Primary, Tertiary	
Strengths, Markets	Secondary	Primary, Tertiary	
Strengths, Endogenous Resources	Secondary	Primary, Tertiary	

Table 3. *Cont.*

Analytical Unit	Higher	Lower	Lowest
Weaknesses, Technological	Secondary	Primary, Tertiary	
Weaknesses, Support Structures	Primary	Secondary	Tertiary
Opportunities, Political	Secondary	Primary, Tertiary	
Opportunities, Social	Primary, Tertiary	Secondary	
Opportunities, Environmental	Secondary	Primary, Tertiary	
Threats, Political	Primary	Secondary	Tertiary
Threat, Economical	Secondary	Primary, Tertiary	
Threats, Technological	Primary	Secondary	Tertiary
Threats, Environmental	Secondary	Primary, Tertiary	
Threats, Legal	Secondary	Primary, Tertiary	

Source: authors' own compilation.

4. Discussion

4.1. The Effect of the Type of Organization

In the Portuguese agri-food sector, corporations are more likely than cooperatives and associations to identify political and legal opportunities and threats. Their access to greater financial resources allows investment in specialized services for monitoring external trends [38]. Their well-organized, hierarchical decision-making processes enable quicker responses to emerging opportunities, unlike the slower, democratic process of cooperatives and associations [39]. In addition, their market-oriented and competitive nature drives them to actively seek and capitalize on external opportunities [40]. Investment in innovation, research, and development further enhances their adaptability to regulatory and environmental changes, positioning them for better exploitation of these opportunities [41]. For instance, integrating *green* technologies and practices not only meets regulatory standards but also fosters long-term profitability and sustainability [42], ensuring corporations can swiftly adapt to evolving regulations and capitalize on new market opportunities [43].

These opportunities often involve aligning the entire value chain with the *farm-to-fork strategy* or effectively internalizing regulations on animal welfare and sustainability, as mentioned by three interviewed organizations. However, these organizations also identify legal threats to their activities more effectively. Five organizations noted increased competition from developing countries with less stringent conditions in terms of wages and social protection and the increasingly demanding legislation applicable to the agri-food complex in the EU. These statements tally with growing protests from EU farmers arguing a lack of conformity in imports from third countries [44].

On the other hand, cooperatives and associations that often prioritize member welfare may lack the resources and strategic focus to identify and respond to external opportunities with effectiveness [45]. Their limited resources often lead to the identification of generic exogenous factors impacting their operations, such as bureaucratic issues, high levels of counterfeiting, regulatory obstacles, and dependency on regional markets. Nonetheless, they recognize a favorable regulatory and political ecosystem as a significant opportunity.

Corporations are more likely than cooperatives and associations to identify environmental opportunities due to their hierarchical structures, financial resources, and market orientation. Hierarchical decision making enables corporations to respond more conveniently to these opportunities [46]. Their financial resources are also directed to investments in research and development for sustainability initiatives [47,48] and to foster innovation in sustainable practices to allow for a competitive advantage [49]. Stakeholder pressure drives corporations to proactively adopt environmental strategies to maintain a positive public image and ensure regulatory compliance [50].

Four surveyed organizations identify environmental issues as business opportunities but also as a way of enhancing their public image. This reflects a shift in perspective, where environmental concerns are genuinely internalized and not just seen as market

opportunities. The new *food ecosystem*, favoring the consolidation of plant-based diets, is considered by four plant production organizations as an excellent business opportunity. The same principle applies to respect for nature and animals, new forms of agricultural production (e.g., organic farming), and new types of packaging and processing. The new crop *eco-intensification* processes and the *carbon market* are referred to by one organization company as having great economic potential.

Conversely, cooperatives and associations, with their consensus-driven processes, tend to innovate locally but may be slower in identifying environmental opportunities [51]. The surveyed associations and cooperatives identified only broader trends like agritourism, food waste reduction, and biodiversity conservation as potential business assets.

Corporations are more likely than cooperatives and associations to identify technological threats due to their heavy investment in technology and the dynamic nature of their competitive environments. Rapid technological advancements can disrupt business models, compelling corporations to be vigilant in monitoring and adapting to these changes [48]. As discussed before, they often invest significantly in research and development to stay ahead of technological disruptions [52]. The need to protect intellectual property and maintain a competitive edge further compels corporations to address technological threats proactively [53]. Corporations' strategic focus on innovation and market leadership makes them more sensitive to potential technological risks [49].

Several surveyed organizations expressed concerns about the rapid pace of technological innovation and digital transition. Two organizations emphasize the risk associated with the cost of equipment, technological training, and the introduction of innovative biotechnology. In contrast, cooperatives and associations, often focused on member and community interests, may lack the resources to prioritize technological shifts, identifying only broad challenges, like high innovation costs and limited funding [49].

Our study shows that corporations are less likely to view economic issues as threats compared with associations and cooperatives. This may be because corporations prioritize profit maximization and market expansion, which can lead them to overlook long-term economic risks due to their short-term focus [54]. Even when consumer purchasing power decreases slightly or raw material costs rise, most of the surveyed corporations do not identify or emphasize typical economic aspects as determining threats.

On the opposing side, cooperatives and associations, which are driven by member interests and consensus-based decision making, are more attentive to potential economic threats capable of impacting their sustainability and community [51]. These organizations tend to be more attentive to economic challenges, with thirteen out of the fifteen cooperatives and associations analyzed clearly and assertively identifying increased competition and rising production costs as significant threats to their business models.

Additionally, corporations are more likely to identify endogenous resources and support structures as strengths or weaknesses. Their robust internal assessments and strategic resource management practices enable them to conduct comprehensive audits, recognizing internal strengths and addressing potential weaknesses that could hinder performance [55,56].

Organizations in fishing and marine resource management identify both the strengths and the weaknesses of their sector, while, at the same time, they are aware of its weaknesses. They highlight the high quality and technological innovation as strengths while noting weaknesses, such as the excessive dependence on modern retail and the lack of capacity to attract young talent. In the meat and the smoked charcuterie industry, strengths include a focus on innovation and adaptable production capacity. However, weaknesses such as the small economic size of the organizations, reliance on modern distribution, and difficulties in training skilled labor are significant concerns. In the wine and other alcoholic beverages sector, which is strategic in the studied region, organizations emphasize investment in innovation and promotion yet struggle with training and retaining high-level technicians. Member participation and collective decision-making emphasis, which can dilute the focus on internal resource optimization, are common in associations and cooperatives [57]. As a

result, corporations' structured approach to internal analysis allows a better identification and promotion of endogenous factors.

Corporations are more likely to identify economic, financial, and technological aspects as organizational strengths due to their focus on maximizing shareholder value, robust financial resources, and technological investments. This strategic orientation allows them, through financial analyses and technology assessments, identify areas where they hold competitive advantages [48]. Their robust financial systems and access to capital markets support this capability [47]. Additionally, corporations often lead in adopting advanced technologies, reinforcing their technological strengths [49]. Many surveyed corporations reported that the structural strengthening of the regional agri-food sector is the result of significant investments made recently in distribution and logistics. The constant search for the best production technologies is also recognized as a critical internal asset.

In contrast, associations and cooperatives, which prioritize member benefits and collective decision making, may lack the capacity for detailed economic and technological evaluations [51]. Therefore, strategic focus and resource availability make corporations more capable of identifying these strengths [58,59]. Cooperatives and associations fail to identify the focus on technology and economic–financial aspects as strengths of commercial activity, which is demonstrated by the interviewees, as only one organization identifies these aspects.

4.2. The Effect of the Sector of Activity

The secondary sector, involving the agri-food industry, is more likely to identify environmental and political aspects as both opportunities and threats compared to the primary (agriculture and fisheries) and tertiary (services) sectors. This sensitivity is likely due to the sector's significant environmental impact and the complex regulatory environment faced. Firms in the industrial sector are often subject to the stringent environmental regulatory landscape they face. Industrial firms often encounter stringent environmental regulations and are pressured to innovate sustainably, making them more aware of environmental risks and opportunities [60]. Additionally, political factors, such as trade policies and industrial regulations, also heavily impact this sector, requiring a keen awareness of political dynamics [50,59]. In contrast, agriculture focuses on primary production and the tertiary sector on service delivery, each with less direct engagement with these regulatory and environmental issues [61]. This operational and regulatory environment drives the secondary sector's heightened focus on these aspects.

Ten surveyed organizations highlighted the secondary sector's ability to identify impactful exogenous aspects such as political and economic constraints, EU policies favoring third countries, climate change, and shifts in the food paradigms driven by growing consumer environmental awareness.

The secondary sector tends to focus less on social aspects as opportunities compared to the primary and tertiary sectors. This is due to its primary emphasis on operational efficiency and production rather than social impact [49]. Factories often prioritize technological and financial concerns, reflecting a strategic focus on cost reduction and process optimization [50,59]. Social aspects, such as community engagement and employee well-being, may receive less attention unless driven by regulatory demands or external pressures [62]. In contrast, agriculture might engage more with local communities due to its direct interaction with natural resources, while the tertiary sector is inherently more involved with service-oriented social impacts [63].

It is for the reasons mentioned above that we find in some of the surveyed organizations operating in the primary sector especially receptive to assuming opportunities related to the resilient preservation of traditions and maintenance of ancestral cultures. These opportunities align with the sector's focus on labor specialization and emerging food trends. In contrast, the tertiary sector identifies opportunities in responding to the growing demand for local products, which favors short supply chains, and in offering agritourism

services, which align with the new paradigms of citizen relationships with nature and the rural environment.

The secondary sector, however, is more likely to view economic, technological, and legal aspects as threats compared to the primary and tertiary sectors. This is due to its heavy reliance on technological advancements and economic stability [64]. Factories in this sector are particularly vulnerable to technological disruptions and cybersecurity threats, driving continuous investment in innovation and compliance with evolving standards [65]. Additionally, economic threats, such as market volatility and supply chain risks, have a more direct impact on production and financial stability [66]. Legal threats are also significant due to the sector's complex regulatory requirements [67]. Conversely, the tertiary sector faces fewer direct technological and economic threats but must still comply with legal and regulatory issues [68].

Ten of the secondary sector organizations identify as threats the worrying national and international macroeconomic situation, the high costs of production factors, like energy, the rapid obsolescence of computer equipment, the EU's increasingly intervening regulatory action, and the increasingly complex legislative framework, especially when organizations intend to enter a new market. Among all sectors, the tertiary sector is less likely to identify the economy, technology, and regulatory framework as threats. The organizations surveyed within the sector, in no case, categorically point to that type of threat. Vaguely, only a service provider mentions the small economic size of the organizations as an exogenous conditioning factor.

The secondary sector exhibits a higher probability of identifying support structure weaknesses compared to the primary and tertiary sectors. This heightened awareness of support structure weaknesses in the secondary sector is largely due to its reliance on complex supply chains, technology, and infrastructure [69]. Factories often face significant challenges related to logistics, technology integration, and infrastructure maintenance, which can exacerbate vulnerabilities in their support structures [70].

The primary sector, while also facing support structure challenges, tends to be more focused on production and environmental management due to its typically less complex support structures compared to the secondary sector [49]. On the contrary, the tertiary sector generally experiences fewer issues with support structures since service delivery relies less on physical infrastructure and intricate supply chain complexities [71]. Services are typically more adaptable and less reliant on intricate support systems than manufacturing and extraction operations.

The operational demands in the secondary sector and the complexity of its support systems need a greater focus on identifying and addressing weaknesses. This focus is less pronounced in the primary and tertiary sectors, reflecting the varying levels of support structure complexity across different economic sectors [72].

Some surveyed organizations in the secondary sector identify obstacles to their operations and business expansion, which are particularly inadequate local transport infrastructure. Additionally, the reliance on external energy suppliers, who often operate in oligopolistic markets, is also cited by three organizations as a weakness. Conversely, the tertiary sector is least likely to view support structures as barriers. This lower perception is evident from the lack of references to support structures as limiting factors among the organizations in the tertiary sector interviewed for this study.

The secondary sector is more likely to identify endogenous resources as strengths compared to other sectors. Factories rely heavily on internal capabilities such as technological expertise, skilled labor, and efficient production processes [73]. In contrast, the primary sector's strength lies more in natural resources and environmental conditions, while the tertiary sector relies on service-oriented capabilities and customer relationships [49]. Therefore, while all sectors utilize endogenous resources, the secondary sector's intricate and technology-driven operations give higher importance to these internal strengths.

The availability of raw materials—such as milk, meat, grapes, and fish—in both quantity and quality is highlighted by many of the surveyed organizations in the secondary

sector as a weakness. Additionally, the presence of a business model that relies on the high levels of knowledge and expertise of the workforce is noted, whether for technologically advanced products or those requiring significant artisanal intervention. There is also a growing interest among several organizations in collaborating with the regional education and research ecosystem to develop new manufacturing technologies and innovative products. Furthermore, some organizations point to their high technological potential, which gives them confidence about the future.

While endogenous resources are equally important to other sectors, their utilization and/or intensification are generally lower compared to the secondary sector. Consequently, organizations in the primary sector emphasize factors such as soil, water, and climate as significant.

The secondary sector is less likely to identify market aspects as strengths compared to the other sectors. This lower identification rate may be due to the focus on internal efficiencies and technological capabilities rather than market dynamics [74]. In contrast, the primary sector faces significant market challenges related to resource prices and demand fluctuations, while the tertiary sector deals with market competition and service quality issues more directly [75]. Most of the surveyed organizations in primary production pay particular attention to market value as a fundamental and determining asset. Various types of supply and demand, sensitivity to environmental issues, and the growing consumption of healthy products, especially vegetables and fish, drive constant improvement and the introduction of new consumer engagement methods, such as short supply chains and online sales.

In the tertiary sector, the emphasis on market internationalization arises from the highly globalized and competitive environment currently characterizing this sector. As noted in this study, some service-providing organizations highlight the strong orientation of their business activities and sectors towards increasingly global and comprehensive markets.

4.3. Limitations and Future Directions

This study has several limitations that should be acknowledged. First, the sample size of 39 organizations, although diverse, was obtained through convenience sampling, potentially limiting the generalizability of the findings. Additionally, the reliance on self-reported data through a SWOT analysis could introduce biases, as participants might have emphasized certain aspects more than others, potentially skewing the results. The use of a structured coding system for analyzing responses, while ensuring consistency, may have also constrained the depth of qualitative insights by focusing on predefined categories, despite the mixed methods used, where qualitative information complements quantitative interpretation of data.

It is relevant to point out that the surveyed organizations consider economic aspects as both opportunities and threats. The importance of economic issues is largely dominant compared to the other PESTEL factors considered. This fact highlights the determinism that economic issues hold in the agri-food sector in Northern Portugal. Thus, economic problems place significant pressure on regional organizations to demonstrate the necessary clarity to mitigate threats and enhance opportunities.

In the context of the MEETHS approach, the studied organizations identified markets as the most referenced force. This factor is largely conditioned by the internal capacity of organizations to prepare for competitive challenges. The indication that they feel comfortable with the way they foresee selling their products (both nationally and internationally) suggests a reasonably secure future for the continuation of their business activities.

However, this assumption should be considered with some caution, as markets are also highlighted as a significant weakness. Nevertheless, in the context of the MEETHS analysis, markets are not the only significant weakness. Human resources and economic–financial aspects are equally important as endogenous conditioning factors. This fact may reveal some concern, as it indicates that the studied organizations seem incapable, by their means, of resolving a wide and diverse range of internal weaknesses and problems.

Future research could address these limitations by expanding the sample size. This would enhance the generalizability of the findings and provide a more comprehensive understanding of the agri-food sector's strategic responses to external challenges. Longitudinal studies could also examine how organizational perceptions and strategies evolve, providing insights into the long-term effectiveness of different approaches.

Further studies could explore the interplay between the PESTEL and MEETHS factors, offering a more holistic view of how macro-environmental and micro-environmental factors interact to shape organizational strengths, weaknesses, opportunities, and threats. Exploring the role of emerging trends, such as digitalization and sustainability, in the agri-food sector could provide valuable insights into future opportunities and challenges. Research could also investigate the specific impact of policy changes and technological advancements on different types of organizations within the sector, offering actionable recommendations for industry stakeholders.

4.4. Executive Summary of Recommendations to Stakeholders

This study of the agri-food sector in Northern Portugal offers important insights into how different types of organizations perceive and respond to external opportunities and threats. Below are key recommendations based on the findings arising from the present study.

4.4.1. Enhance Strategic Flexibility

Corporations must invest in technology and innovation to maintain a competitive edge. However, they must balance short-term market expansion with long-term sustainability by regularly reassessing economic risks and opportunities. Cooperatives and associations must strengthen strategic planning processes by improving access to specialized external monitoring services. They must invest in capacity-building initiatives to enhance members' ability to identify and act on external opportunities.

4.4.2. Foster Collaborative Networks

All organizations are encouraged to pursue partnerships between corporations, cooperatives, associations, and academic institutions. Collaborating on research and development projects, particularly in sustainable practices and new technologies, can drive innovation and competitiveness across the sector.

4.4.3. Adapt to Regulatory and Environmental Changes

Corporations must proactively align business practices with evolving environmental and regulatory standards. They must continue integrating sustainability into core operations, which not only mitigates risks but also enhances public image and long-term profitability. Cooperatives and associations must develop a more proactive approach to regulatory changes by leveraging collective knowledge and lobbying efforts. They must focus on local innovation that addresses both environmental concerns and member welfare.

4.4.4. Invest in Market and Technological Capabilities

Given the heightened sensitivity of the secondary sector to economic and technological threats, they must prioritize investments in cutting-edge technologies and robust supply chain infrastructure. Also, they must address cybersecurity concerns to protect against technological disruptions. The primary and tertiary sectors must focus on market adaptability by exploring new consumer trends and diversifying product offerings. They must emphasize local and sustainable production methods, which are increasingly valued by consumers.

4.4.5. Address Resource Limitations

The different sectors of activity must conduct comprehensive internal audits to better understand and leverage endogenous resources. For the primary sector, this includes

maximizing the sustainable use of natural resources. The secondary sector should focus on optimizing technological and human resources, while the tertiary sector can enhance service quality through better customer relationship management.

4.4.6. Expand and Diversify Research

All sectors of activity and type of organizations must engage with policymakers and academic institutions through their research centers to foster opportunities to address their problems. A research center can significantly support organizations in the agri-food sector by providing critical insights and data-driven strategies. By conducting in-depth studies on emerging market trends, technological advancements, and regulatory changes, research can help organizations anticipate challenges and seize opportunities. Collaborations with industry players allow for tailored research that addresses specific needs, such as optimizing supply chains, enhancing sustainability practices, and improving product innovation. Additionally, academic institutions can offer training and capacity-building programs, equipping organizations with the knowledge and skills necessary to adapt to a rapidly changing business environment.

5. Conclusions

This study highlights the distinctive ways in which different organizational types within the Portuguese agri-food sector perceive and respond to external opportunities and threats. Corporations, with their hierarchical structures, robust financial resources, and market-oriented strategies, are more adept at identifying and capitalizing on political, legal, environmental, and technological opportunities and threats. Their investment in innovation, technology, and regulatory compliance positions them advantageously within the sector. However, this focus on short-term market expansion may cause them to underestimate long-term economic risks.

Conversely, cooperatives and associations, driven by member welfare and consensus-based decision making, exhibit a more conservative approach. They tend to identify broader, generic threats and opportunities, often lacking the resources for detailed strategic analysis. While their focus on local innovation and member benefits contributes positively to community engagement and sustainability, it also limits their ability to respond swiftly to external pressures, particularly in areas like technology and market dynamics.

This study also reveals sectoral differences, with the secondary sector (agri-food industry) demonstrating a heightened sensitivity to environmental and political aspects due to its regulatory environment, both at the national and EU levels. In contrast, the primary and tertiary sectors focus more on local and sustainable practices, with the tertiary sector also emphasizing market adaptability and service quality.

Given these findings, all types of organizations within the sector need to enhance their strategic flexibility, foster collaborative networks, and adapt proactively to regulatory and environmental changes. Corporations, cooperatives, and associations should focus on leveraging their unique strengths while addressing their limitations, particularly in technology, market adaptability, and resource management.

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