INNOVATIVE LEADERSHIP IN AGRICULTURE: TRANSFORMING FARM RESOURCES INTO INNOVATIVE RURAL PRODUCTS – THE CASE OF TUSCANY

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A R T I C L E I N F O

Original Article

Received: *29 March 2026*

Accepted: *20 May 2026*

doi:10.59267/ekoPolj2602419I

UDC 005.322:005.591.6]:711.3 (450.52)

Keywords:

visionary leadership; resource transformation; innovation orientation; market integration; rural development; structural equation modeling

JEL: *Q12, Q13, O31, M10, L26*

A B S T R A C T

Agricultural systems are increasingly shifting from production-oriented models toward diversified and market-integrated structures, requiring new approaches to value creation. The purpose of this study is to examine how leadership influences the transformation of farm resources into innovative and market-relevant outputs. The research is based on survey data collected from 488 farm owners and agricultural entrepreneurs in Tuscany, and the relationships among constructs were analyzed using a structural modeling approach. The results show that visionary leadership significantly drives resource transformation and innovation, while innovation orientation represents the strongest predictor of market integration. Resource transformation also contributes directly and indirectly to market outcomes through innovation processes. The findings indicate that value creation in agriculture follows a sequential pathway linking leadership, resources, innovation, and markets. The study concludes that leadership is a key mechanism in enhancing farm competitiveness and sustainability. It is recommended that farm managers and policymakers support leadership development, resource diversification, and innovation-oriented strategies in rural areas.

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Introduction

Agriculture is increasingly shaped by structural transformations driven by market volatility, technological change, and the need for diversification (Knežević et al., 2025). Traditional production models are evolving toward multifunctional systems that integrate value-added products, services, and experiences, particularly through agritourism and rural entrepreneurship (Mowla et al., 2026; Popescu et al., 2023; Drăgoi et al., 2018). In this context, the ability to transform resources into market-relevant outputs has become a key determinant of competitiveness (Turčinović et al., 2025). The resource-based view (Barney, 1991) and dynamic capability theory (Teece, 2007) provide a relevant theoretical foundation; however, their application in agricultural systems remains fragmented, as prior studies predominantly examine innovation, diversification, or entrepreneurship in isolation (Hjalager, 2010; Radovanović, 2025; Wang et al., 2024; Vik & McElwee, 2011).

Innovation orientation and resource transformation are recognized as critical for value creation in rural contexts (Cvijanović et al., 2025; Vujanić et al., 2025; Korsgaard et al., 2026), while market integration determines the realization of these outputs (Marković & Mihajlović, 2006; Popescu & Andrei, 2011). Nevertheless, the relationship among these elements remains insufficiently integrated, particularly regarding the role of leadership. Although leadership is acknowledged as a driver of innovation and strategic change (Ignjatović et al., 2023), its function in initiating resource transformation and shaping subsequent innovation and market integration has not been systematically examined.

Furthermore, existing research lacks process-oriented models that capture the sequential nature of rural value creation, where resource transformation, innovation, and market integration operate as interconnected stages (Gaba et al., 2026). To address these gaps, this study develops and empirically tests a structural model linking visionary leadership, resource transformation, innovation orientation, and market integration within a unified framework. The empirical analysis is conducted in Tuscany, a region characterized by advanced integration of agriculture, heritage, and market-oriented diversification (Lombardi et al., 2021).

The study examines how visionary leadership shapes the transformation of farm resources into innovative and market-integrated outputs, focusing on both direct and indirect relationships among constructs. It advances existing research by conceptualizing agricultural competitiveness as a process-based pathway in which leadership acts as the central activating mechanism connecting resources, innovation, and market outcomes. By integrating RBV and dynamic capability perspectives, the study provides a more comprehensive explanation of how internal capabilities are translated into market performance. In addition, the analysis of mediation effects offers deeper insight into the mechanisms of value creation, with practical implications for farm management and rural development policy.

Literature Review and Hypotheses Development

Within the resource-based view (RBV), firm performance depends on the strategic mobilization and recombination of valuable resources (Barney, 1991). In agricultural contexts, resources such as land, heritage, and local knowledge often require reinterpretation, consistent with dynamic capability theory emphasizing managerial agency in resource transformation (Teece, 2007). Visionary leadership plays a central role in this process by enabling the recognition and activation of latent resource value, particularly in multifunctional rural development (Yasin & Bacsi, 2025; Pesut, 2025). In agritourism and rural entrepreneurship, leadership facilitates resource recombination across agriculture, tourism, and services (Shitile et al., 2025), with empirical evidence confirming its influence on resource valorization and diversification (Zhu, 2026). Accordingly, leadership functions as an active mechanism of resource transformation.

H1: Visionary leadership positively influences the transformation of farm resources into innovative rural products.

Innovation orientation reflects an organization's strategic openness to experimentation, creativity, and the adoption of new ideas (Hurley & Hult, 1998). In agricultural contexts characterized by strong traditional practices, leadership plays a critical role in fostering such orientation. Upper echelons theory suggests that organizational outcomes are shaped by leaders' cognitive frames and values (Hambrick & Mason, 1984), with visionary leaders more likely to promote risk-taking and challenge established production logics, particularly in path-dependent rural systems (Shao et al., 2024). Empirical research further confirms leadership as a key driver of innovation adoption and strategic change in rural enterprises (Adnan et al., 2025). Accordingly, leadership enables the emergence of new products and services through an innovation-supportive environment.

H2: Visionary leadership positively influences innovation orientation in agricultural enterprises.

Resource transformation expands the range of value-creating activities by enabling the reconfiguration of existing assets, consistent with RBV and dynamic capability perspectives (Teece, 2007). In rural contexts, innovation frequently emerges through the reinterpretation of traditional resources, such as embedding cultural identity into products or converting agricultural landscapes into experiential offerings (Turtureanu et al., 2025), reflecting territorial embeddedness (Ray, 1998). Empirical evidence indicates that diversified farms are more likely to develop innovative business models (Hjalager, 2010), suggesting that resource transformation acts as a precondition for innovation.

H3: Resource transformation capability positively influences innovation orientation in farms.

The economic relevance of transformed resources depends on their connection to markets, as value creation must be translated into market participation. In agribusiness and rural tourism, resource transformation enables access to new segments through differentiated offerings and reduced reliance on traditional production (Martinus et al., 2024). This process is reinforced by short supply chains and localized markets, which enhance visibility and competitiveness (Vujko et al., 2025).

H4: Resource transformation capability positively influences the market integration of innovative rural products.

Innovation orientation facilitates the translation of internal capabilities into market outcomes, as innovation generates value only when commercialized (Schumpeter, 1934). In rural enterprises, it supports the development of differentiated products and adaptation to evolving demand (Hjalager, 2010), with evidence linking innovation orientation to higher market performance and integration (Saharti, 2025).

H5: Innovation orientation positively influences the market integration of farm products.

In addition to indirect effects, visionary leadership directly shapes market integration by guiding strategic positioning, branding, and market engagement. Leadership enables the connection between local production and broader market networks (Vik & McElwee, 2011), aligning internal capabilities with external opportunities (Porter, 1985).

H6: Visionary leadership positively influences the market integration of innovative rural products.

Mediating Mechanisms

The model incorporates mediating effects reflecting the sequential nature of rural value creation. Resource transformation is expected to mediate the relationship between leadership and innovation, as dynamic capability theory suggests that leadership shapes outcomes through resource reconfiguration rather than direct innovation (Teece, 2007).

H7: Resource transformation mediates the relationship between visionary leadership and innovation orientation.

Innovation orientation further mediates the relationship between resource transformation and market integration, as transformed resources generate potential value that must be converted into marketable outputs through innovation.

H8: Innovation orientation mediates the relationship between resource transformation and market integration.

Materials and methods

This study employs a quantitative, cross-sectional design to test the structural relationships among visionary leadership, resource transformation, innovation orientation, and market integration. The empirical analysis was conducted in Tuscany, a region characterized by advanced agricultural development and strong integration of farming, heritage, and tourism (Mensing et al., 2025; Vollheyde & von Haaren, 2024). The target population included farm owners and agricultural entrepreneurs, as key decision-makers in innovation and strategic processes. The final sample (N = 488) reflects a predominantly male, middle-aged, and experienced population, operating mainly small to medium-sized farms with diversified activities and primarily local and regional market orientation.

Data were collected through a structured online survey administered between January and March 2026, distributed via professional platforms and agricultural networks (e.g., LinkedIn, Facebook, Agriturismo.it, Coldiretti, Confagricoltura, CIA – Agricoltori Italiani). A screening question ensured that only respondents with managerial roles participated. The sampling approach was purposive and convenience-based, with voluntary and anonymous participation. The sample size exceeds recommended thresholds for structural equation modeling (Hair et al., 2010).

The questionnaire initially included 28 items measuring four constructs: visionary leadership, resource transformation, innovation orientation, and market integration, using a five-point Likert scale. Measurement was grounded in established frameworks, including innovation orientation (Hurley & Hult, 1998), upper echelons theory (Hambrick & Mason, 1984), RBV and dynamic capabilities (Barney, 1991; Teece, 2007), rural resource transformation (Turtureanu et al., 2025), and market integration (Porter, 1985). Following exploratory factor analysis, 19 items were retained, ensuring improved reliability and validity in line with recommended procedures (Hair et al., 2010).

Data analysis was conducted using SPSS and AMOS. Descriptive statistics were followed by tests of sampling adequacy (KMO, Bartlett's test), confirmatory factor analysis, and structural equation modeling. Model fit was assessed using standard indices (CFI, TLI, RMSEA, RMR, GFI, AGFI) (Hair et al., 2010). Reliability and validity were evaluated through composite reliability, average variance extracted, the Fornell–Larcker criterion, and HTMT. Structural relationships, including mediation effects, were tested using bias-corrected bootstrapping procedures.

Results

The results presented in Table 1 indicate a very high level of sampling adequacy, as evidenced by the KMO value of 0.962, which significantly exceeds the recommended threshold of 0.60. This suggests that the dataset is highly suitable for factor analysis, with strong intercorrelations among variables. Furthermore, Bartlett's Test of Sphericity is statistically significant ($\chi^2 = 6752.678$, df = 378, $p < 0.001$), indicating that the correlation matrix is not an identity matrix and that meaningful relationships exist among the observed variables. Taken together, these results confirm that the data meet the necessary assumptions for conducting exploratory and confirmatory factor analyses, thereby supporting the validity of subsequent multivariate procedures.

Table 1. KMO and Bartlett's Test of Sphericity

Test	**Value**
Kaiser–Meyer–Olkin (KMO) Measure of Sampling Adequacy	0.962
Bartlett's Test of Sphericity	
Approx. Chi-square	6752.678
df	378
Sig.	0.000

Source: Authors' research

The results indicate four factors with eigenvalues greater than 1, supporting their retention according to the Kaiser criterion. The first factor explains the largest share of variance (39.798%), while the remaining factors contribute 6.983%, 6.534%, and 5.034%, resulting in a cumulative explained variance of 51.416%, which confirms the adequacy of the solution. The use of oblimin rotation reflects the expected correlation among factors, with interpretation based on the pattern matrix. Overall, the findings support a coherent four-factor structure suitable for further confirmatory analysis.

Table 2. Total Variance Explained

Factor	Initial Eigenvalues (Total)	% of Variance	Cumulative %	Extraction Sums of Squared Loadings (Total)	% of Variance	Cumulative %
1	11.144	39.798	39.798	10.647	38.026	38.026
2	1.955	6.983	46.781	1.452	5.186	43.213
3	1.829	6.534	53.315	1.293	4.618	47.831
4	1.409	5.034	58.349	1.004	3.585	51.416

Note: Extraction method: Maximum Likelihood. Rotation method: Oblimin with Kaiser normalization. Source: Authors' research

The results of the exploratory factor analysis (EFA), presented in Table 3, reveal a clear and well-defined four-factor structure corresponding to the theoretically proposed dimensions: *Innovation Orientation, Visionary Leadership, Resource Transformation,* and *Market Integration*.

Table 3. Pattern Matrix

	Factor			
	Innovation Orientation	Visionary Leadership	Resource Transformation	Market Integration
Opportunity Vision	-,012	,696	,003	,008
Strategic Thinking	,020	,726	,002	,042
Adaptive Leadership	,012	,696	,054	-,045
Value Vision	,019	,658	,002	-,006
Land Diversification	-,037	,008	-,634	-,055
Facility Adaptation	-,005	,005	-,653	-,029
Nature Utilization	-,060	,060	-,675	-,022
Knowledge Transformation	,090	,000	-,688	,090
Innovation Investment	,709	,027	-,015	-,018
Model Experimentation	,679	,043	-,074	,039
Risk Acceptance	,672	,030	-,040	-,012
Innovation Culture	,728	,013	,016	-,035
Trend Awareness	,696	,003	,004	,009
Business Collaboration	,062	,018	,028	-,752
Consumer Orientation	,066	,079	,065	-,749
Marketing Innovation	,022	-,023	-,028	-,742

	Factor			
	Innovation Orientation	**Visionary Leadership**	**Resource Transformation**	**Market Integration**
Stakeholder Partnership	-,028	,038	-,081	-,723
Digital Promotion	-,022	,012	-,014	-,770
Market Responsiveness	-,023	,001	-,033	-,776

Source: Authors' research

All four constructs exhibit strong and consistent factor loadings, confirming clear dimensional structure and internal coherence. Visionary Leadership, Resource Transformation, Innovation Orientation, and Market Integration are well defined, with no significant cross-loadings, while the direction of loadings does not affect interpretation. The results confirm convergent validity and support the adequacy of the measurement model for further analysis. The measurement model demonstrates excellent fit (CMIN/DF = 0.878; p = 0.852), with fit indices exceeding recommended thresholds (CFI = 1.000, TLI = 1.005, IFI = 1.004). Additional indicators (RMSEA = 0.000, PCLOSE = 1.000; RMR = 0.011; GFI = 0.973; AGFI = 0.965) further confirm strong model adequacy.

As shown in Table 4, no substantial cross-loadings are observed, confirming clear item–factor associations and discriminant validity. The results support the proposed four-factor structure and its suitability for further analysis. Composite reliability values exceed 0.70 for all constructs (CR = 0.769–0.903), confirming internal consistency. Convergent validity is supported for Innovation Orientation (AVE = 0.526) and Market Integration (AVE = 0.607), while slightly lower AVE values for Visionary Leadership (0.475) and Resource Transformation (0.454) remain acceptable given adequate reliability.

Table 4. Composite Reliability (CR) and Average Variance Extracted (AVE)

Construct	CR	AVE
Innovation Orientation	0.847	0.526
Visionary Leadership	0.783	0.475
Resource Transformation	0.769	0.454
Market Integration	0.903	0.607

Source: Authors' research

As shown in Tables 5 and 6, discriminant validity is confirmed, as the square roots of AVE exceed inter-construct correlations (Fornell–Larcker criterion), and all HTMT values remain below 0.85, with the highest at 0.74.

Table 5. Fornell–Larcker Criterion

Construct	Innovation Orientation	Visionary Leadership	Resource Transformation	Market Integration
Innovation Orientation	**0.725**			
Visionary Leadership	0.59	**0.689**		
Resource Transformation	0.65	0.56	**0.674**	
Market Integration	0.74	0.57	0.65	**0.779**

Source: Authors' research

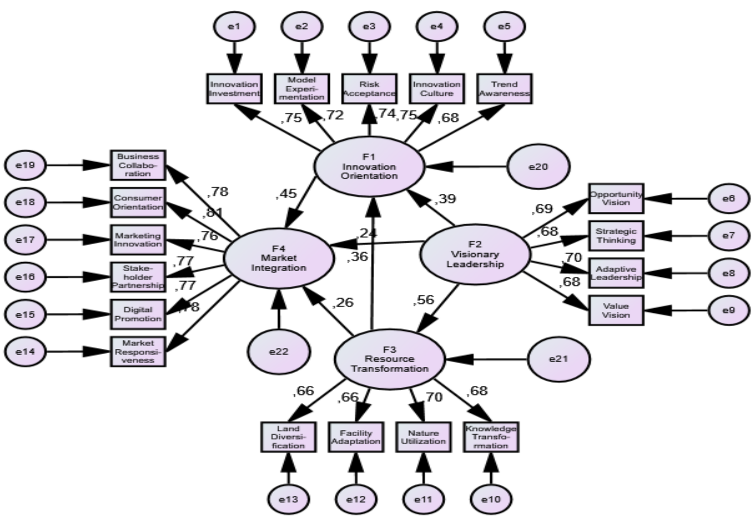
Table 6. HTMT Ratio

Construct Pair	HTMT
Innovation Orientation – Visionary Leadership	0.59
Innovation Orientation – Resource Transformation	0.65
Innovation Orientation – Market Integration	0.74
Visionary Leadership – Resource Transformation	0.56
Visionary Leadership – Market Integration	0.57
Resource Transformation – Market Integration	0.65

Source: Authors' research

The structural model shows good fit (CMIN/DF = 1.310), with fit indices above recommended thresholds (CFI = 0.989, TLI = 0.987, IFI = 0.989). Additional indicators (RMSEA = 0.025, PCLOSE = 1.000; RMR = 0.026; GFI = 0.960; AGFI = 0.948) further confirm model adequacy despite a significant chi-square (χ^2 = 192.621, p = 0.007).

Figure 1. Structural Equation Modeling (SEM)



Source: Prepared by the authors (2026).

The structural model results are presented in Table 7, which summarizes the standardized path coefficients (β), standard errors (SE), critical ratios (C.R.), and significance levels for all hypothesized relationships.

Table 7. Structural Model Results

Hypothesis	Path	β (Standardized)	SE	C.R.	p-value	Supported
H1	Visionary Leadership → Resource Transformation	0.557	0.067	8.403	***	Yes
H2	Visionary Leadership → Innovation Orientation	0.387	0.080	5.819	***	Yes
H3	Resource Transformation → Innovation Orientation	0.358	0.079	5.399	***	Yes
H4	Resource Transformation → Market Integration	0.257	0.060	4.580	***	Yes
H5	Innovation Orientation → Market Integration	0.449	0.052	7.756	***	Yes
H6	Visionary Leadership → Market Integration	0.241	0.060	4.309	***	Yes

Source: Authors' research

Table 7. Structural Model Results clearly indicates that all proposed direct relationships are statistically significant and positive, providing full empirical support for hypotheses H1–H6. The results reveal that visionary leadership exerts a strong and significant effect on resource transformation (β = 0.557, C.R. = 8.403, $p < 0.001$), supporting H1. This represents the strongest path in the model directed toward resource capabilities, suggesting that leadership plays a central role in enabling farms to reinterpret and utilize their tangible and intangible resources in innovative ways. Furthermore, visionary leadership also significantly influences innovation orientation (β = 0.387, C.R. = 5.819, $p < 0.001$), confirming H2. This finding highlights the importance of leadership in shaping an organizational climate that supports experimentation, creativity, and the development of new ideas within agricultural enterprises. The analysis also demonstrates that resource transformation capability positively affects innovation orientation (β = 0.358, C.R. = 5.399, $p < 0.001$), supporting H3. This suggests that when farms successfully reinterpret land, heritage, and knowledge, they create a foundation for further innovation processes. Regarding market outcomes, resource transformation shows a significant positive effect on market integration (β = 0.257, C.R. = 4.580, $p < 0.001$), supporting H4. Although moderate in magnitude, this relationship indicates that transformed resources contribute directly to the ability of farms to position their products within the market.

At the same time, innovation orientation has the strongest effect on market integration (β = 0.449, C.R. = 7.756, $p < 0.001$), supporting H5. This finding underscores that innovation acts as a key mechanism through which farm products achieve market relevance and competitiveness. Finally, visionary leadership also directly influences market integration (β = 0.241, C.R. = 4.309, $p < 0.001$), supporting H6. Although weaker than the indirect pathways, this result indicates that leadership contributes not only through internal capabilities but also through strategic market positioning. Overall, the structural model demonstrates a coherent pattern in which visionary leadership drives both resource transformation and innovation orientation, which in turn enhance market integration. The relative strength of the paths suggests that innovation orientation serves as the most critical direct predictor of market integration, while leadership plays a foundational role in activating the entire transformation–innovation–market chain.

The mediation results presented in Table 8 reveal that both indirect pathways in the model are not only statistically significant but also substantively meaningful for explaining how leadership-driven processes unfold within farm-based innovation systems.

Table 8. Mediation Effects (Standardized)

Hypothesis	**Path**	**Direct Effect**	**Indirect Effect**	**95% BC CI Lower**	**95% BC CI Upper**	**Mediation Type**	**Supported**
H7	Visionary Leadership → Resource Transformation → Innovation Orientation	0.415	0.222	0.170	0.280	Partial mediation	Yes
H8	Resource Transformation → Innovation Orientation → Market Integration	0.449	0.180	0.130	0.240	Partial mediation	Yes

Source: Authors' research

The findings show that resource transformation acts as a key transmission mechanism through which visionary leadership enhances innovation orientation (H7). The indirect effect ($\beta = 0.222$) is substantial relative to the direct effect ($\beta = 0.415$), indicating that a significant portion of leadership influence is channelled through the reinterpretation and recombination of farm resources. This suggests that leadership does not operate solely at the level of organizational climate, but materially restructures how resources are mobilized, thereby enabling innovation. At the same time, the persistence of a strong direct effect confirms partial mediation, implying that leadership simultaneously influences innovation both structurally (through resources) and behaviorally (through strategic orientation). This dual pathway highlights the multi-layered nature of leadership impact in rural innovation contexts. Furthermore, the results demonstrate that innovation orientation serves as a critical mechanism linking resource transformation to market integration (H8). The indirect effect ($\beta = 0.180$) indicates that transformed resources do not automatically translate into market outcomes; rather, their value is realized through innovation processes that convert resource potential into marketable products and services.

Although the direct effect of resource transformation on market integration remains strong (β = 0.449), the presence of a significant indirect pathway confirms that innovation acts as a necessary amplifying layer, enhancing the economic relevance of transformed resources. This again reflects partial mediation, suggesting that both direct commercialization and innovation-driven pathways coexist. Taken together, these findings indicate a sequential value-creation logic within the model: leadership activates resource transformation, resource transformation enables innovation, and innovation strengthens market integration. The coexistence of direct and indirect effects across both mediation paths points to a complementary rather than substitutive mechanism, where multiple pathways jointly contribute to performance outcomes. These results further support the interpretation of agricultural value creation as a staged and cumulative process, in which each subsequent phase amplifies and operationalizes the outcomes of the previous one. As shown in Table 9, the model explains a substantial proportion of variance across all endogenous constructs, confirming its strong explanatory and predictive capacity.

Table 9. Explained Variance (R^2)

Endogenous Construct	R^2	Interpretation
Resource Transformation	0.310	Moderate
Innovation Orientation	0.474	Moderate to High
Market Integration	0.552	High

Source: Authors' research

The highest explanatory power is observed for Market Integration ($R^2 = 0.552$), followed by Innovation Orientation ($R^2 = 0.474$) and Resource Transformation ($R^2 = 0.310$). This pattern reflects a sequential structure in which explanatory power increases along the transformation–innovation–market pathway.

Discussions

The findings provide a process-based explanation of value creation in agriculture, showing that competitiveness depends on the strategic reconfiguration and deployment of resources rather than their mere possession (Barney, 1991; Teece, 2007). The results confirm that visionary leadership plays a central role in activating resource transformation (H1), supporting its function as a micro-foundation of dynamic capabilities (Teece, 2007) and aligning with arguments on the reinterpretation of endogenous rural resources (Ray, 1998). Leadership also directly shapes innovation orientation (H2), consistent with upper echelons theory (Hambrick & Mason, 1984) and prior findings on innovation adoption in rural contexts (Zhao et al., 2025).

The relationship between resource transformation and innovation orientation (H3) confirms that innovation emerges through the recombination of existing resources (Barney, 1991), particularly in rural contexts where traditional assets are reinterpreted into new offerings (Turtureanu et al., 2025), extending prior work on diversification (Vujko et al., 2025). Resource transformation further contributes to market integration

(H4) by enabling differentiated outputs and access to new market segments, consistent with research on rural entrepreneurship and short supply chains (Masi et al., 2025). Innovation orientation plays a central role in converting internal capabilities into market outcomes (H5), in line with Schumpeterian theory (Schumpeter, 1934), confirming that transformed resources generate value only when embedded in innovation-driven strategies (Labella-Fernández et al., 2026).

Visionary leadership also directly influences market integration (H6), supporting strategic management perspectives on aligning internal capabilities with external opportunities (Porter, 1985) and facilitating market access in rural systems (Vik & McElwee, 2011). The mediation effects further clarify these mechanisms: resource transformation mediates the relationship between leadership and innovation (H7), consistent with dynamic capability theory (Teece, 2007), while innovation orientation mediates the link between resource transformation and market integration (H8), reflecting a sequential transformation–innovation–market pathway. These results confirm a cumulative and multi-stage process in which leadership activates resources, resources enable innovation, and innovation drives market outcomes.

The study contributes by integrating RBV and dynamic capability perspectives through a leadership-centered framework that explains how internal capabilities are translated into market performance. Empirically, the Tuscan context illustrates this process, showing how traditional resources are transformed into high-value, market-integrated offerings within advanced agritourism systems. This suggests that competitiveness in rural regions depends not on scale, but on the ability to recombine local assets and position them within differentiated market segments, offering transferable insights for other regions undergoing similar transitions.

Conclusions

This study demonstrates that agricultural competitiveness depends on the alignment of leadership, resource transformation, innovation, and market integration within a coherent value-creation system. These elements operate as an interconnected process in which leadership acts as the central mechanism activating and linking internal capabilities to market outcomes. By integrating resource transformation and innovation, the study advances fragmented approaches and shows that value creation is capability-driven rather than resource-based. The findings further indicate that competitiveness relies on the strategic recombination of local assets and innovation-oriented practices rather than scale or production intensity.

From a practical perspective, the results highlight the need to strengthen leadership capabilities and support innovation-oriented strategies through capacity building and knowledge transfer. Limitations include the cross-sectional design and restricted generalizability, suggesting future research should adopt longitudinal and comparative approaches and incorporate additional dimensions such as digital transformation and sustainability. The findings indicate that agricultural development increasingly depends on the ability to transform resources and integrate them into market systems through leadership-driven innovation.

Conflict of interests

The authors declare no conflict of interest.

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