

Circular economy implementation as the cornerstone of green competitive advantage in the wine industry: A PLS-SEM and IPMA Analysis

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Abstract

The present study investigates how Circular Economy Implementation (CEI) enhances Green Competitive Advantage (GCA) in the wine industry by examining CEI as the mediating mechanism linking Green Shared Vision (GSV) and Green Mindfulness (GM) with competitive outcomes. Despite the strategic relevance of sustainability, empirical evidence remains limited on how cognitive and behavioral dimensions promote the transition toward circular production models in resource-intensive sectors such as wine production. Grounded in the Natural Resource-Based View (NRBV), a structural model was estimated using Partial Least Squares Structural Equation Modeling (PLS-SEM) and Importance–Performance Map Analysis (IPMA). Based on survey data from 207 Spanish wineries, the analysis evaluates both direct and mediated relationships and identifies the relative importance and performance of CEI in shaping GCA. The findings demonstrate that CEI acts as a key mediating mechanism linking cognitive orientation and environmental awareness with competitive outcomes, reinforcing GCA by channeling the influence of GSV and GM through specific circular practices that exhibit the highest levels of importance and performance. Building on these results, the study offers three main contributions. First, it extends the NRBV by conceptualizing CEI as a dynamic process through which wineries transform environmental knowledge, shared vision, and mindful awareness into sustained competitive advantage. Second, it develops an empirical model that demonstrates how GSV and GM strengthen GCA through the effective implementation of CEI. Third, it offers evidence-based implications for winery managers, underscoring that reinforcing cognitive alignment and proactive environmental awareness enhances the adoption of circular practices.

Keywords: circular economy implementation, green competitive advantage, green shared vision, green mindfulness, wine industry, Spain.

1. Introduction

The wine industry is a key component of the European agri-food system and one of the sectors most dependent on environmental resources. In 2024, Spain produced approximately 36.8 million hectoliters of wine and cultivated around 911,000 hectares of vineyards, positioning the country among the top three global producers and generating an estimated economic impact of about €20 billion annually [2]. However, its structural

reliance on soil, water, and climate exposes wineries to increasing risks, which are altering production cycles and threatening both competitiveness and long-term sustainability [3].

These environmental challenges are reinforced by growing regulatory and market pressures, as the European Green Deal and the Circular Economy Action Plan set targets for carbon neutrality by 2050 and substantial reductions in waste and resource use by 2030 [4], urging wineries to implement circular and energy-efficient practices across their production processes. This regulatory evolution is accompanied by a profound shift in how sustainability performance is measured and incentivized at the European level. As Sardone *et al.* [5] explain, the transition from the Farm Accountancy Data Network to the Farm Sustainability Data Network reflects a move toward integrated assessment systems that combine economic, environmental, and sustainability indicators, particularly in the wine sector. This change increases the relevance of firms' internal capacity to generate, interpret, and coordinate sustainability-related information, as performance is no longer evaluated solely through financial outcomes but through composite indicators linked to environmental stewardship. Simultaneously, consumers increasingly associate product quality and authenticity with environmental responsibility, linking purchasing choices to firms' sustainability performance and traceability standards [6]. The Spanish wine industry therefore faces the dual challenge of preserving competitiveness and tradition while complying with sustainability frameworks that are redefining value creation in global markets [7]. In this context, Circular Economy Implementation (CEI) represents a strategic mechanism to reconcile competitiveness with sustainability, enabling wineries to optimize resources, valorize by-products, and reduce waste through closed-loop operations [8].

The Natural Resource-Based View (NRBV) offers a coherent framework to understand how wineries convert environmental pressures into competitive advantage, emphasizing that long-term success relies on developing environmentally oriented capabilities that minimize ecological impact and simultaneously create economic and reputational value [9]. In the wine industry, this process extends beyond technological innovation, requiring the assimilation of sustainability principles and the cultivation of intangible assets that shape collective behavior and strategic decision-making [10]. In this regard, Green Shared Vision (GSV) promotes alignment around shared environmental objectives and strengthens long-term strategic coherence [11], while Green Mindfulness (GM) enhances the ability to identify, interpret, and address environmental challenges through reflection

and adaptive learning [12]. Within the present study, GSV captures the strategic dimension of sustainability by defining the collective direction that guides environmental action, whereas GM reflects a managerial orientation concerned with how environmental issues are continuously noticed, discussed, and incorporated into day-to-day decision-making. Accordingly, GM is conceptualized at the organizational level as managerial GM, serving as a proxy for the firm's collective alertness rather than as an individual psychological trait. This distinction allows GSV to be understood as the cognitive mechanism that establishes where the organization seeks to position itself environmentally, while GM represents the process through which environmental challenges are addressed in practice, shaping how sustainability objectives are translated into concrete organizational responses. These capabilities can improve wineries' managerial and organizational skills, allowing them to merge traditional expertise with environmental innovation and advance toward sustainable production systems. Nevertheless, despite their relevance, prior research has rarely examined these cognitive antecedents simultaneously in the context of CEI, resulting in a fragmented understanding of how shared vision and mindful awareness jointly shape circular practices within firms. As a result, existing studies provide limited insight into how strategic alignment around environmental objectives and ongoing managerial reflection interact to support the firm-level operationalization of circular economy principles.

The interaction between GSV and GM determines how wineries transform environmental awareness into effective CEI, which functions as the mechanism through which cognitive alignment and collective mindfulness translate into GCA. The internal pathways linking GSV and GM with CEI and GCA remain insufficiently examined within the wine industry, where competitiveness increasingly depends on integrating sustainability into strategic objectives [7]. This limitation reflects a broader pattern in the circular economy literature, where CEI has predominantly been approached from technological, operational, and governance perspectives, while its cognitive foundations remain under-theorized and weakly integrated into existing models.

This gap becomes more apparent when examining more closely how prior studies have approached the relationship between circular economy and competitiveness in the wine sector. On the one hand, some contributions have framed circular strategies primarily in terms of assessment and governance at the value-chain level. For instance, Cavicchi and Vagnoni [13] analyze how performance measurement systems support the monitoring of

economic and environmental outcomes generated by circular partnerships, thereby emphasizing control architectures and inter-organizational coordination rather than the internal cognitive and behavioral mechanisms that enable circular implementation within wineries. On the other hand, a substantial body of research has relied on qualitative and exploratory designs to investigate the diffusion of circular economy models. In this respect, Sehnem *et al.* [14] relate the adoption of circular practices to different stages of maturity in the wine chain, while Moreira *et al.* [15] document limited adoption and weak managerial engagement among Portuguese wineries. Similarly, Prazeres *et al.* [16] underscore the role of absorptive capacity and coordination challenges in explaining why circular strategies often remain weakly embedded in business models.

In parallel, other contributions have concentrated on evaluating the outcomes of specific circular interventions. In this sense, Mura *et al.* [17] provide evidence of cost savings and greenhouse gas reductions associated with circular packaging strategies, but their analysis remains centered on the performance effects of a particular business model and does not address the organizational processes through which environmental orientation is systematically translated into sustained competitive advantage. Related patterns can also be observed in adjacent research domains. In the context of wine tourism, Campo-Villares and Fuentes-Fernández [18] show that sustainability-oriented and circular practices enhance winery revenues and contribute to rural development, but their explanation is grounded in territorial and experiential dynamics rather than in firm-level capability transmission. From a strategic management perspective, Lorenzo *et al.* [19] demonstrate that competitive advantage in the Spanish wine industry depends on the configuration of resources and capabilities. However, CEI is not theorized as a key mechanism connecting environmental orientation with competitive outcomes. More recently, Martínez-Falcó *et al.* [20] incorporate circular economy practices as a moderating condition in the relationship between wine tourism and green performance, which further contrasts with the present study's focus on CEI as an endogenous process through which internal cognitive and behavioral capabilities shape competitive advantage. Collectively, these streams of research point to a notable absence of integrative frameworks that connect organizational vision, mindful awareness, and circular implementation within a unified explanatory model.

Therefore, the academic literature indicates that, although the relevance of circular economy practices for performance in the wine sector is well recognized, limited attention

has been devoted to explaining how such practices are internally generated and strategically mobilized within wineries. In response to this gap, the present research seeks to address the following Research Questions (RQs): (RQ1) Does CEI positively influence GCA in wineries? (RQ2) Does CEI positively mediate the relationship between GSV and GCA in the wine industry? (RQ3) Does CEI positively mediate the relationship between GM and GCA in the wine industry? In order to answer these questions, this study draws on data from 207 Spanish wineries and applies Partial Least Squares Structural Equation Modeling (PLS-SEM) and Importance–Performance Map Analysis (IPMA) to empirically examine how internal capabilities facilitate the implementation of CEI and contribute to the development of circular and sustainable production models in the wine industry.

This study makes three main contributions. First, it extends the NRBV by conceptualizing CEI as a dynamic capability through which wineries can transform cognitive and behavioral orientations toward sustainability into measurable competitive advantages. Second, it advances theoretical understanding by proposing an empirical framework that links GSV and GM with CEI and GCA, emphasizing the relevance of circular practices in industries highly dependent on environmental resources. Third, it provides managerial guidance for wineries, underscoring that cultivating a shared environmental vision and mindful awareness among employees can facilitate the adoption of circular strategies, reinforcing competitiveness and long-term sustainability in the wine sector.

The article is structured as follows. After this introduction, the theoretical framework is presented, analyzing the conceptual relationships between GSV, GM, CEI, and GCA within the context of the wine industry. The following section details the methodology, describing the research design, data collection, and analytical procedures based on PLS-SEM and IPMA. The subsequent section presents the results, followed by a discussion that interprets the findings and highlights their theoretical and managerial implications for wineries. Finally, the conclusions summarize the main contributions of the study, acknowledge its limitations, and propose directions for future research.

2. Theoretical Framework: The Natural Resource-Based View and Hypothesis Development

NRBV provides a solid theoretical framework to understand how firms dependent on natural convert environmental constraints into competitive opportunities. Rooted in the

Resource-Based View, the NRBV argues that firms achieve sustained advantage through the development of environmental capabilities that generate economic and strategic value while preserving ecological integrity [9]. In the wine sector, where production relies on soil, water, and climate stability, rising temperatures, water scarcity, and extreme weather are affecting grape yields and quality, so wineries need to integrate environmental management and resource efficiency to maintain differentiation [21].

Within this context, CEI represents a practical application of the NRBV, enabling wineries to optimize resource use, reduce waste, and create regenerative value through actions such as composting grape pomace, recovering water and energy during vinification, and adopting eco-designed packaging that closes material loops and minimizes environmental impact [22]. Recent contributions in the circular economy literature increasingly conceive circularity as an organizational capability grounded in learning processes, coordination mechanisms, and resource reconfiguration, rather than as a discrete set of practices or a predefined business model configuration [23-24]. Within this perspective, CEI reflects the firm's ability to embed environmental knowledge into operational routines and to adapt production systems in response to sustainability-related challenges.

Despite growing academic and policy interest in circularity within agri-food systems, limited evidence exists on how wineries internalize circular principles and turn them into competitive advantage, even though studies in other industries show that successful circular transitions rely more on organizational learning and sustainability-oriented culture than on technological innovation, a relationship still underexplored in wine firms whose competitiveness increasingly depends on aligning environmental stewardship with strategic objectives. In fact, empirical research has largely examined circular economy practices at the level of governance structures, technological solutions, and performance outcomes [7], while offering less insight into the internal organizational capabilities that enable circular implementation at the firm level, particularly in relation to cognitive and managerial foundations. From the NRBV perspective, CEI can be seen as a dynamic capability that integrates environmental awareness into managerial routines, improving efficiency, reputation, and profitability. Following Hart [9], environmental orientation constitutes a source of strategic potential, yet competitive outcomes depend on the development of firm-specific capabilities that allow such orientations to be

operationalized through consistent and routinized practices. In this sense, CEI can capture the capability through which environmental orientations are translated into sustained competitive advantage in the wine industry. Therefore, this study aims to fill this gap by empirically testing the following hypothesis:

H1. CEI positively influences GCA in wineries.

For CEI to take root, wineries should first establish a collective environmental orientation that aligns organizational members toward shared sustainability objectives [13]. GSV captures this alignment, representing the extent to which individuals within a firm share a common understanding and commitment to environmental goals that shape decision-making and organizational learning [11]. In the wine industry, where operations are deeply intertwined with natural ecosystems, GSV emerges as a critical driver for embedding sustainability into strategic and operational levels, as shown by empirical studies such as Knight *et al* [24], who found that managerial environmental orientation determines the extent to which Australian wineries adopt sustainable practices, and Carrillo-Higueras *et al.* [25], who demonstrated that attitudes and perceived behavioral control are stronger predictors of environmental commitment than external pressures.

In the Spanish context, Sánchez-García *et al.* [26] demonstrated that ethical leadership and environmental management improve green performance through green knowledge sharing, underscoring that a shared vision strengthens collaboration and learning dynamics. Similarly, Martínez-Falcó *et al.* [27] found that top management environmental awareness and proactive engagement enhance knowledge diffusion and sustainable performance among wineries. These insights indicate that a clear and cohesive environmental vision enables the translation of sustainability values into coordinated circular actions, improving efficiency, innovation, and competitiveness. Nonetheless, empirical studies directly linking GSV with CEI and GCA remain limited within the wine sector.

At this stage, literature reveals a persistent theoretical gap. While GSV has been consistently associated with learning, coordination, and sustainability-oriented behavior [24, 26], prior studies do not sufficiently explain the organizational processes through which such cognitive alignment is converted into competitive outcomes. From the NRBV perspective, Hart [9] explicitly distinguishes between environmental orientation as a

source of strategic potential and the deployment of that potential through firm-specific capabilities. Accordingly, the central issue is not whether shared environmental vision matters, but how it is mobilized through organizational mechanisms capable of reshaping operational routines. This distinction is particularly salient in the wine industry, where competitive advantage is closely linked to process efficiency, resource use, and product differentiation [7].

Evidence from circular economy research further reinforces this argument. In this sense, Sehnem *et al.* [14] show that circular economy practices generate stronger organizational outcomes when they reach higher levels of maturity and coherence, rather than when they are adopted in an isolated or symbolic manner. Similarly, Cavicchi and Vagnoni [13] demonstrate that the contribution of circular economy strategies to sustainability and performance becomes visible only when such strategies are embedded in coordinated performance measurement systems. Complementing these insights, Moreira *et al.* [15] and Prazeres *et al.* [16] prove that the main challenge for wineries lies not in recognizing the relevance of circularity, but in integrating circular principles into everyday decision-making and operational routines. Therefore, these studies indicate that CEI functions as the operational mechanism through which shared environmental intentions are translated into consistent practices. Building on this logic, CEI can be conceived as a capability that operationalizes GSV by embedding collective environmental objectives into routines related to resource efficiency, waste reduction, and by-product valorization. Firm-level evidence from the Spanish wine industry supports this view, as Sánchez-García *et al.* [26] and Martínez-Falcó *et al.* [27] show that shared environmental vision enhances internal alignment and knowledge processes, yet competitive benefits materialize only when such alignment is translated into structured practices. Consequently, CEI can constitute a mechanism through which GSV is transformed into GCA, and, accordingly, the following hypotheses are proposed to clarify the process through which GSV contributes to GCA:

H2. GSV positively influences GCA in wineries.

H3. GSV positively influences CEI in wineries.

H4. CEI positively mediates the relationship between GSV and GCA in wineries.

To advance CEI, wineries should develop cognitive and behavioral capabilities that enable them to recognize, interpret, and address environmental challenges effectively, a

process captured by GM, which reflects the organization's capacity for sustained attention and adaptive learning, integrating environmental awareness into daily operations and strategic decision-making [28]. In the context of the wine sector, where production depends on ecological balance and is highly exposed to climatic fluctuations and resource scarcity, GM can foster a culture of alertness and reflection that supports the continuous improvement of sustainable and circular practices [21].

Recent research highlights the growing relevance of mindfulness in shaping environmental behavior. In this regard, Trigo *et al* [29] showed that sustainability awareness among Portuguese wine producers influences their long-term commitment to environmental responsibility, while Mastroberardino *et al.* [30] observed that greater awareness among Italian wineries and consumers contributes to the gradual adoption of sustainable practices despite cultural and market barriers. Similarly, Sánchez-García *et al.* [26] found that environmental reflection and ethical leadership enhance firms' capacity to share green knowledge and consolidate internal alignment around sustainability objectives. Together, these studies suggest that GM reinforces the integration of environmental values into circular decision-making and strengthens the adaptability required for sustained competitiveness. However, despite the growing body of evidence on GM, the literature remains limited in explaining how this cognitive and behavioral orientation is translated into competitive outcomes. Existing research has primarily focused on attitudinal, cognitive, and learning-related effects and, as a result, has offered only partial insight into performance implications. This limitation is also evident in empirical research on the Spanish wine industry, where Martínez-Falcó *et al.* [27] show that GM enhances green knowledge sharing and internal learning processes. Nevertheless, its influence on performance appears to materialize only when environmental awareness is institutionalized into stable organizational routines rather than remaining at an informal and symbolic level.

Consistent with this interpretation, research on the circular economy in the wine sector further emphasizes the relevance of operational integration for achieving competitive outcomes. In particular, Sehnem *et al.* [14], through their analysis of maturity stages along the wine value chain, demonstrate that circular practices generate stronger economic and environmental results when implemented in a coherent and systematic manner. Similarly, Cavicchi and Vagnoni [13] show that the contribution of circular strategies to

sustainability and performance becomes evident when such strategies are embedded within coordinated managerial and performance measurement systems. More recently, Mura *et al.* [17] and Campo-Villares and Fuentes-Fernández [18] reinforce this view by indicating that sustainability initiatives tend to yield limited competitive benefits when implemented in isolation, whereas their integration across production, management, and organizational processes is associated with more durable outcomes. This stream of research shows that environmental awareness and reflection, in the absence of structured operational embedding, are insufficient to account for competitive outcomes in the wine industry.

Building on these insights, this study proposes that CEI may fulfil a mediating role in the relationship between GM and GCA. From an NRBV perspective, CEI can be understood as an organizational capability through which mindful attention to environmental issues is translated into routinized operational practices, including eco-design, closed-loop production, and systematic resource recovery. In this respect, the embedding of GM within recurring organizational routines allows environmental awareness to extend beyond a purely cognitive orientation and to be incorporated into firm-specific capabilities that are difficult to imitate and potentially conducive to competitive advantage [9]. Accordingly, CEI can be seen as a mechanism through which GM may be operationalized and linked to GCA. On this theoretical basis, and with the aim of clarifying the role of GM in supporting circular transformation and competitive differentiation in the wine industry, the following hypotheses are proposed:

H5. GM positively influences GCA in wineries.

H6. GM positively influences CEI in wineries.

H7. CEI positively mediates the relationship between GM and GCA in wineries.

This framework integrates cognitive (GSV), behavioral (GM), and operational (CEI) dimensions within the NRBV, proposing that wineries achieve competitiveness through their ability to transform environmental awareness into circular practices. Moreover, it extends prior research by conceptualizing CEI as a dynamic capability that translates sustainability-oriented cognition into measurable outcomes and unifies previous studies on leadership, knowledge management, and awareness. Figure 1 presents the conceptual model linking GSV and GM to CEI and GCA, illustrating both direct and mediated relationships.

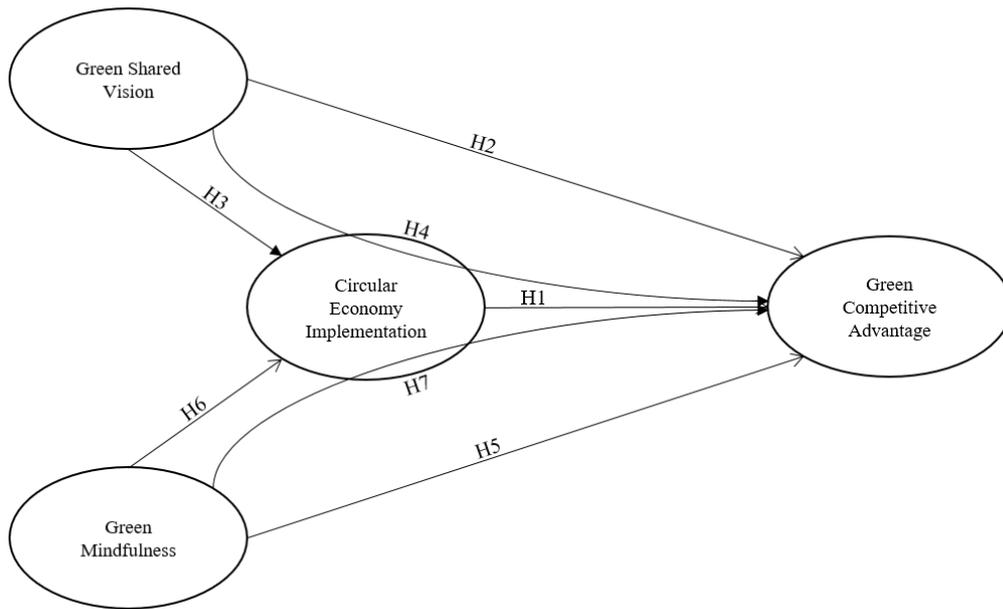


Figure 1. Theoretical model proposed for empirical testing

Source: own elaboration

3. Methodology

This section outlines the methodological framework adopted to examine the relationships among CEI, GSV, GM, and GCA in the Spanish wine industry. The research design ensures analytical rigor through a structured approach that includes: (1) the contextualization of the study, (2) population, sampling, and data collection, (3) bias control and data quality assurance, (4) measurement of variables, and (5) analytical and statistical procedures based on PLS-SEM and IPMA.

4.1 Research context

The Spanish wine industry holds a strategic position within the national agri-food system for its economic relevance, cultural value, and environmental impact. In 2024, Spain produced around 31.0 million hectoliters of wine, remaining the third-largest producer worldwide, and maintained the largest vineyard area, with approximately 913,000 hectares under cultivation [2]. This production performance, however, is embedded in an international market context marked by a sustained contraction of global wine output. In this regard, Del Rey and Loose [31] report that world wine production has fallen to its lowest level in more than sixty years, even though the total value of international wine trade has shown relative stability. This divergence between declining production volumes and stable trade value intensifies competitive pressures and shifts the basis of competition

away from scale and towards differentiation, efficiency, and value creation. Against this backdrop, the Spanish wine sector faces increasing challenges linked to resource scarcity, energy efficiency, and climate adaptation, which reinforce the strategic relevance of circular and sustainable production models [7]. In such a context, GCA can emerge as a critical condition for winery survival and positioning, rather than as a discretionary sustainability outcome. The capacity of wineries to respond to these pressures depends increasingly on the development of green intangible assets that integrate environmental knowledge, innovation, and collective learning [32]. In this regard, GSV can contribute to internal coherence around sustainability objectives, whereas GM strengthens organizational capabilities to identify, interpret, and respond to environmental challenges in a proactive manner.

4.2 Population, sampling, and data collection

This study examines Spanish wineries registered under the National Code of Economic Activities 1102, which includes 4,373 establishments according to the Iberian Balance Sheet Analysis System. The total population was considered, and data were collected through a structured online questionnaire developed from a comprehensive review of academic literature. Prior to its distribution, the instrument was pretested with seven professionals from the Spanish wine sector, including three winemakers, two sustainability officers and two senior managers, who participated in a one-hour session to assess the clarity, accuracy and contextual relevance of the questions. In line with this objective, the pre-test allowed the research team to refine the interpretation of items related to CEI so that they reflected winery-specific operational realities. In this sense, indicators referring to product repairability and repair services were discussed in terms of durability, reuse, and the extension of product and packaging lifespan within production and distribution systems, whereas indicators related to end-of-life collection were understood as the winery's participation in structured recycling and bottle return systems coordinated with local waste-management entities. The feedback obtained in this phase was incorporated into the final version to ensure consistency with the sector's terminology and operational practices. The questionnaire was distributed via the Qualtrics platform between September 2023 and February 2024, using an initial invitation followed by three reminders to increase participation. Data collection coincided with the implementation of new environmental regulations concerning recyclable content, reuse

targets and traceability, which provided a timely empirical context. From the 229 responses received, 207 were validated after removing incomplete or inconsistent entries.

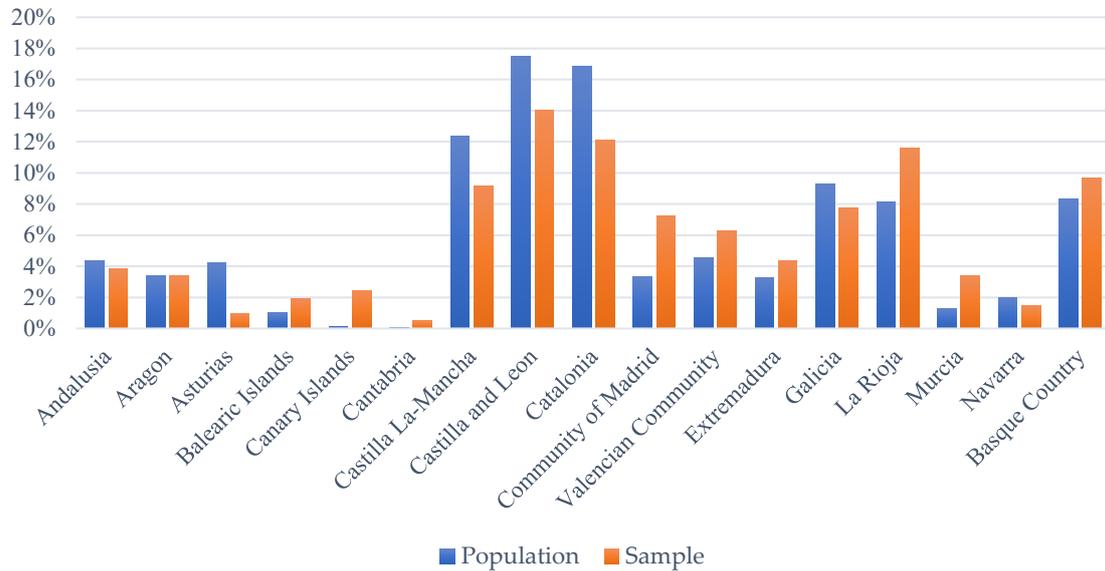
In order to strengthen the analytical robustness of the study, particular attention was paid to the territorial composition of the sample. A geographically stratified contact strategy was applied to ensure representation of all Spanish autonomous communities, using their relative weight within the national wine sector as reported by the Iberian Balance Sheet Analysis System as a benchmark. As a result, wineries from all autonomous communities are included in the final sample. The regions with the highest representation are Castilla and Leon (14%), Catalonia (12%), La Rioja (12%), and the Basque Country (10%), proportions that are consistent with their relative importance within the Spanish wine industry. This alignment supports the territorial representativeness of the sample (see Figure 2).

Although stratification was primarily implemented on a geographical basis, the resulting sample also shows a firm-size distribution that closely mirrors the population structure. Micro-wineries (fewer than 10 employees) account for 62% of the sample, compared with 71% in the population. Small wineries (10–49 employees) represent 31% of the sample, relative to 25% in the population, while medium-sized wineries (50–249 employees) constitute roughly 6% (versus 3% in the population), and large wineries (more than 250 employees) represent 2% of the sample (compared with 1% in the population). This distribution indicates a close correspondence between the sample and the population in terms of organizational size, supporting the structural adequacy of the dataset (see Figure 3).

Out of the total population of 4,373 wineries, 229 responses were initially obtained, corresponding to an overall response rate of 5.24%. After data screening procedures, 207 questionnaires were retained for the final analysis, yielding an effective response rate of 4.73%. Although necessarily limited, this response rate is consistent with those commonly reported in firm-level survey research in the wine industry, since recent empirical studies conducted in comparable contexts report response rates of a similar magnitude. In this sense, Sánchez-García *et al.* [26] and Martínez-Falcó *et al.* [27], both focusing on Spanish wineries and applying PLS-SEM techniques, document response rates below 5%. Comparable participation levels are also reported in studies examining sustainability-related strategies in the wine sector, such as Barisan *et al.* [33] in Italian PDO wine districts, as well as in more recent research by Bentivoglio *et al.* [34] on blockchain

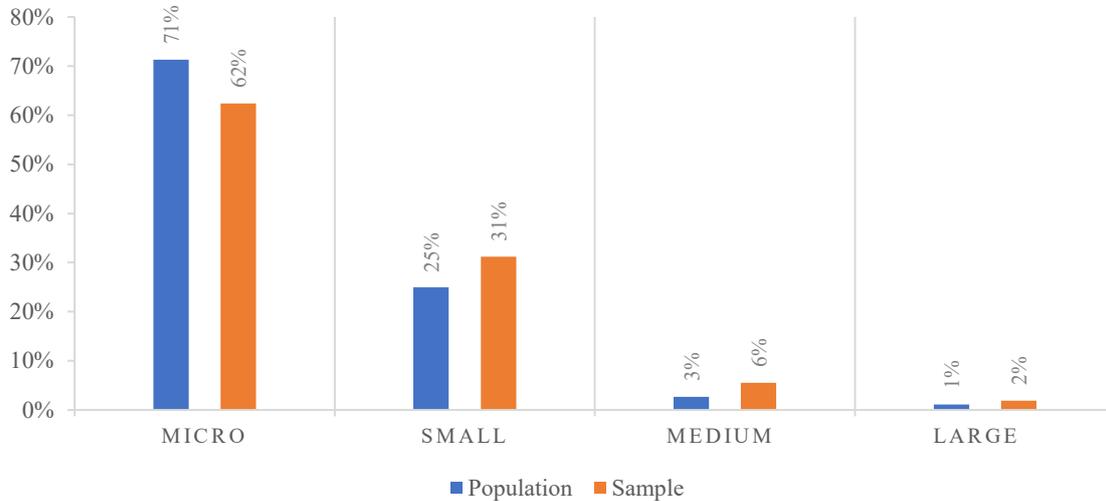
adoption in Italian winemaking using structural equation modeling, both of which document similarly response rates.

Figure 2. Regional distribution of wineries in the population and sample



Source: own elaboration

Figure 3. Firm size distribution in the population and study sample



Source: own elaboration

4.3 Control of bias and data quality assurance

In order to ensure methodological rigor and the reliability of the results, both procedural and statistical strategies were applied to minimize potential sources of bias. Participants were fully informed about the academic purpose of the research and the confidentiality of their responses, which encouraged transparency and reduced the potential influence of social desirability. From a statistical perspective, Harman's single-factor test was

conducted to examine the presence of common method variance, and the first factor accounted for only 14.28% of the total variance, remaining well below the 50% threshold, which indicates that common method bias was not a concern. In order to assess nonresponse bias, the initial 229 questionnaires were compared with the 207 valid observations retained after data cleaning, and independent t-tests revealed no statistically significant differences between both groups, confirming the representativeness and consistency of the final sample used in the analysis. Likewise, to complement Harman's single-factor test, full collinearity diagnostics were conducted following recent methodological recommendations [35]. The resulting Variance Inflation Factor (VIF) values ranged from 1.19 to 2.08, remaining well below the conservative threshold of 3.3 commonly used to indicate potential common method bias, thus reducing the likelihood that common method variance inflates the estimated relationships.

4.4 Measurement of variables

All constructs were measured using previously validated scales from the academic literature (see Appendix). GSV was evaluated through a four-item scale developed by Jansen *et al.* [36], which assesses the extent to which employees share environmental goals, agree on the company's strategic environmental direction, and show enthusiasm toward its collective environmental mission. Consistent with its conceptualization, GSV captures the degree of strategic alignment around environmental objectives at the organizational level. GM was measured with a five-item scale adapted from Williams and Seaman [37], capturing employees' openness to discussing environmental issues, awareness of sustainability challenges, and willingness to report and share environmental knowledge. In line with the research design, GM is operationalized at the managerial level and reflects the perceptions of the key informant regarding the winery's collective patterns of environmental attention, reflection, and responsiveness. Accordingly, GM is interpreted as a proxy for organizational-level GM rather than as an individual psychological trait, capturing how environmental issues are cognitively processed and addressed in daily managerial practices. CEI was assessed using seven items inspired by Singh and Ordoñez [38], covering product design for repairability and biodegradability, the collection of end-of-life materials, the reuse of by-products, and the use of recycled resources. GCA was measured with a four-item scale from Lin and Chen [39], evaluating cost efficiency, product quality, environmental R&D, and green management capabilities. All constructs were rated on a seven-point Likert scale (1 = strongly disagree; 7 = strongly

agree), and the analysis incorporated three control variables, PDO certification, winery size, and winery age, classified according to OECD [40] criteria.

4.5 Analytical method and statistical procedures

The proposed theoretical model was assessed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.1.1.1. This method is suitable for examining complex relationships among latent and observed variables, particularly in management and social sciences, where constructs are abstract and multidimensional [41]. Its use in this study is justified by three main reasons: (1) PLS-SEM enables the simultaneous estimation of direct, indirect, and mediating effects, allowing a comprehensive analysis of the proposed model [42]; (2) the sample size of 207 observations exceeds the minimum requirement for robust and reliable estimations [43]; and (3) previous studies have validated its application in research addressing sustainability and competitive advantage in the wine industry [44]. Additionally, IPMA was employed to complement the structural assessment by examining the relative importance and performance of the constructs.

Results

The results section is divided into two main parts. The first covers the evaluation of the overall, measurement, and structural models to verify the model's fit, reliability, and validity. The second focuses on the IPMA, which examines the relative importance and performance of each indicator in explaining the implementation of circular economy practices.

Global, measurement and structural model assessment

Following the recommendations of Hair *et al.* [45], the results are presented in three sections: (1) assessment of the overall model, (2) evaluation of the measurement model, and (3) examination of the structural model.

In the first place, the estimated model demonstrates an adequate overall fit, as the Standardized Root Mean Square Residual (SRMR) value is below the recommended threshold of 0.08. This indicates that the difference between the observed and predicted correlations remains within acceptable limits, confirming that the model reproduces the data structure with sufficient accuracy [46]. Consequently, the model can be considered suitable for the subsequent stages of analysis.

After confirming the overall fit, the measurement model was evaluated to verify the reliability and validity of the constructs, considering the individual reliability of the indicators, internal consistency, and convergent validity. As presented in Table 1, all outer loadings exceed the recommended threshold of 0.707 [47], confirming that each indicator appropriately represents its corresponding construct. The statistical significance of these loadings, verified through bootstrapping, further supports their robustness. Internal consistency is also satisfactory, as the values of composite reliability (ρ_c), Dijkstra–Henseler’s rho_A (ρ_a), and Cronbach’s alpha are all above 0.80, indicating that the indicators are highly correlated and measure coherent latent dimensions [48]. In addition, the Average Variance Extracted (AVE) for all constructs exceeds 0.50, which demonstrates adequate convergent validity and shows that the latent variables explain a substantial proportion of the variance of their observed indicators [45]. These results confirm that the measurement model meets the required reliability and validity criteria for further analysis.

Table 1. Measurement model analysis: external loadings, construct reliability and convergent validity

Construct/Items	Outer Loadings	Rho_c (Pc)	Rho_a (Pa)	Cronbach's Alpha	AVE
Green Shared Vision (GSV)		0.920	0.888	0.884	0.699
GSV 1	0.858				
GSV 2	0.860				
GSV 3	0.874				
GSV 4	0.853				
Green Mindfulness (GM)		0.889	0.834	0.833	0.712
GM 1	0.849				
GM 2	0.864				
GM 3	0.846				
GM 4	0.735				
GM 5	0.876				
Circular Economy Implementation (CEI)		0.912	0.888	0.886	0.781
CEI 1	0.724				
CEI 2	0.741				
CEI 3	0.782				
CEI 4	0.822				
CEI 5	0.745				
CEI 6	0.808				
CEI 7	0.873				
Green Competitive Advantage (GCA)		0.878	0.816	0.815	0.747
GCA 1	0.814				
GCA 2	0.846				
GCA 3	0.793				

GCA 4	0.753
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Source: compiled by authors

Discriminant validity was assessed to ensure that each construct represented a distinct dimension within the model. The analysis was conducted using the Heterotrait–Monotrait ratio of correlations (HTMT) proposed by Henseler *et al.* [49]. As shown in Table 2, all HTMT values are below the conservative threshold of 0.85, indicating that the constructs are empirically differentiated and that their correlations remain within acceptable limits. These results confirm that the measurement model satisfies the discriminant validity criteria established in the literature.

Table 2. Discriminant validity analysis based on the Heterotrait-Monotrait criterion

	AGE	CEI	GCA	GM	GSV	PDO	SIZE
AGE							
CEI	0.103						
GCA	0.070	0.653					
GM	0.078	0.565	0.714				
GSV	0.064	0.564	0.681	0.696			
PDO	0.123	0.044	0.101	0.091	0.099		
SIZE	0.085	0.088	0.111	0.089	0.064	0.177	

Source: compiled by authors

After verifying the reliability and validity of the measurement model, the structural relationships were analyzed through bootstrapping with 5,000 resamples. The results, presented in Table 3 and Figure 4, show that all hypothesized paths are positive and statistically significant, confirming the consistency of the proposed model. CEI exerts a strong and significant influence on GCA ($\beta = 0.545$, $p < 0.001$), underscoring the importance of circular practices in strengthening competitive positioning. GSV also exerts a positive influence on both GCA ($\beta = 0.179$, $p < 0.05$) and CEI ($\beta = 0.326$, $p < 0.001$), while GM demonstrates significant positive influences on GCA ($\beta = 0.206$, $p < 0.001$) and CEI ($\beta = 0.298$, $p < 0.001$). Regarding the indirect relationships, CEI mediates the influence of GSV on GCA ($\beta = 0.178$, $p < 0.001$) and of GM on GCA ($\beta = 0.163$, $p < 0.001$), confirming H4 and H7 and indicating that part of the influence of both GSV and GM on competitive advantage operates through the implementation of circular practices. The model explains 31.2% of the variance in CEI ($R^2 = 0.312$) and 63.6% in GCA ($R^2 = 0.636$), demonstrating satisfactory explanatory capacity. The control variables SIZE ($\beta = 0.017$, $p = 0.456$), AGE ($\beta = 0.004$, $p = 0.922$) and PDO ($\beta = 0.113$, $p = 0.240$) present positive but statistically non-significant influences on GCA.

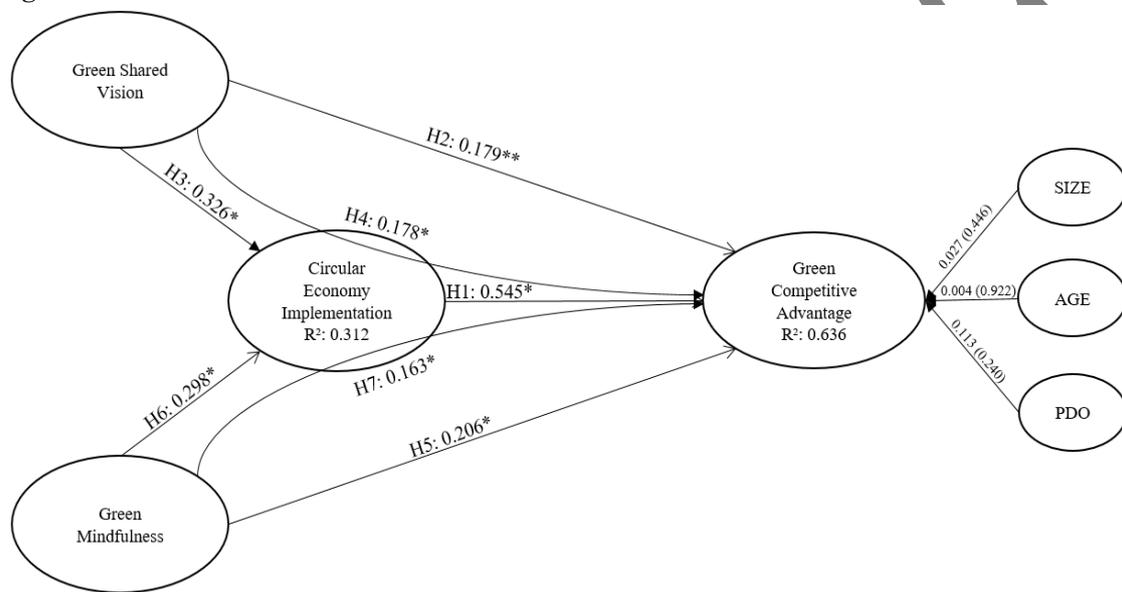
Table 3. Results of the structural model for the mediation model

Direct Effects	Path Coefficient	t-Value	P Value	95 % BCCI	Hypothesis supported
CEI → GCA	0.545	10.730	0.000*	[0.446; 0.646]	H1 supported
GSV → GCA	0.179	3.176	0.002**	[0.062; 0.286]	H2 supported
GSV → CEI	0.326	4.921	0.000*	[0.196; 0.458]	H3 supported
GM → GCA	0.206	3.538	0.000*	[0.092; 0.318]	H5 supported
GM → CEI	0.298	4.426	0.000*	[0.167; 0.431]	H6 supported
Indirect Effects	Path Coefficient	t-Value	P Value	95 % BCCI	Hypothesis supported
GSV → CEI → GCA	0.178	4.522	0.000*	[0.090; 0.244]	H4 supported
GM → CEI → GCA	0.163	4.146	0.000*	[0.105; 0.260]	H7 supported

Notes: BCCI = Bias Corrected Confidence Intervals; **p<0.05 *p<0.001

Source: compiled by authors

Figure 4. Results of the theoretical model formulated



Note: **p<0.05 *p<0.001

Source: own elaboration

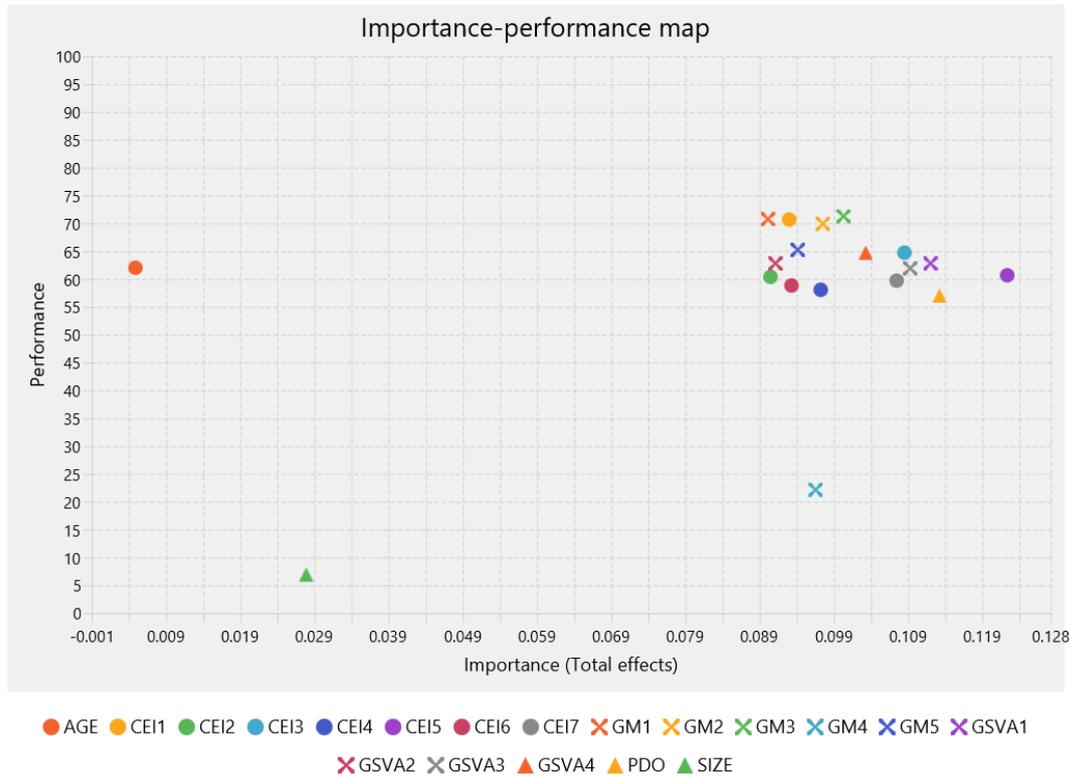
Importance-Performance Analysis (IPMA)

The IPMA provides complementary insights into how each indicator contributes to GCA and the degree to which these indicators are effectively implemented. As shown in Figure 5, the indicators related to CEI, GM, and GSV present the highest levels of both importance and performance, highlighting their key role in explaining the competitive positioning of firms.

In the CEI construct, the most relevant dimensions are those associated with product recovery, repair services, and the incorporation of recycled materials, represented by CEI3, CEI5, and CEI7, which achieve both high importance and strong performance values. These results indicate that companies are consolidating practices aimed at extending product life cycles and promoting material circularity. In contrast, CEI4 and

CEI6, related to the use of biodegradable packaging and the reuse of by-products, exhibit moderate performance levels, suggesting that these areas are less developed within firms. Regarding GM, the results show consistently high levels of performance, especially for GM3, which reflects employees' capacity to pay attention to environmental problems and respond to unexpected situations. GM1 and GM2, which capture open communication and the exchange of diverse opinions on environmental issues, also register high performance, reinforcing the idea of an organizational culture oriented toward environmental awareness and dialogue. Conversely, GM4, linked to the reporting of environmentally significant information, shows the lowest level of performance, while GM5, referring to the recognition of employees who share environmental knowledge, reaches intermediate values, indicating that incentive systems for environmental information sharing could be further strengthened. In the case of GSV, the indicators display a balanced pattern of results, with GSVA1 and GSVA3 showing slightly higher values of importance and performance. These findings suggest that firms exhibit a strong degree of alignment regarding environmental objectives, strategic direction, and collective commitment to sustainability. The remaining indicators, GSVA2 and GSVA4, maintain similar scores, which points to a cohesive vision and shared enthusiasm among employees toward the company's environmental mission. The control variables show limited influence compared with the main constructs. PDO presents moderate importance and performance, whereas AGE and size record low values, indicating that structural factors have a minor role in explaining GCA.

Figure 5. Indicator-Level Importance–Performance analysis for green competitive advantage



Note: CEI = Circular Economy Implementation; GSV = Green Shared Vision; GM = Green Mindfulness; GCA = Green Competitive Advantage; PDO = Protected Designation of Origin; AGE = Winery Age; SIZE = Winery Size.

Discussion and conclusion

This study deepens understanding of how wineries transform environmental awareness into strategic advantage by showing that CEI constitutes a key mediating mechanism connecting GSV and GM with GCA. The results indicate that wineries characterized by a shared environmental vision and a mindful organizational orientation are more capable of converting sustainability-related intentions into circular practices that strengthen efficiency, reputation, and long-term competitiveness. At the same time, the findings indicate that these cognitive and behavioral orientations do not automatically translate into competitive outcomes, underscoring the conditional nature of their effects. This evidence is consistent with the arguments developed by Sehnem *et al.* [14], who underline that the effectiveness of circular business models in the wine sector depends primarily on organizational learning and sustainability-oriented culture rather than on technological solutions in isolation. Building on this perspective, the present study provides quantitative evidence that cognitive foundations contribute more effectively to competitiveness when they are embedded within a structured circular economy implementation capability.

The magnitude of the estimated relationships further reinforces this interpretation. CEI exhibits the strongest effect on GCA, whereas the direct effects of GSV and GM are more moderate. This difference in effect size indicates that environmental orientation and mindfulness function as enabling conditions rather than as direct drivers of competitive advantage. This pattern aligns closely with the NRBV as originally formulated by Hart [9], which distinguishes environmental orientation as a source of strategic potential from the organizational capabilities required to exploit that potential. From this perspective, GSV and GM shape internal alignment and awareness, yet competitive outcomes emerge when these orientations are translated into operational routines that are difficult for competitors to replicate.

This explanation gains additional support when compared with prior research on circular economy practices in the wine industry. Cavicchi and Vagnoni [13] show that circular strategies contribute to sustainability outcomes when they are embedded within coordinated managerial and performance measurement systems across the value chain, implicitly acknowledging that fragmented adoption yields limited results. The present findings complement this view at the firm level, indicating that GSV and GM provide the internal cognitive conditions that facilitate coordination, whereas CEI captures the operational process through which such conditions materialize into competitive advantage. Similarly, Mura *et al.* [17] document economic and environmental benefits associated with circular packaging strategies, although their analysis remains focused on specific interventions. In contrast, the current results suggest that sustained competitiveness depends less on isolated initiatives and more on the broader capability to implement circular practices consistently across organizational processes.

Moreover, the mediating role of CEI also clarifies tensions identified in qualitative studies. In this sense, Moreira *et al.* [15] and Prazeres *et al.* [16] report that many wineries recognize the relevance of circular economy principles yet struggle to embed them into daily decision-making. The present evidence supports this observation empirically, showing that environmental awareness and shared vision are insufficient to explain GCA unless they are institutionalized through CEI. This finding helps explain why prior studies report context-dependent effects of circular strategies, particularly in settings where implementation capabilities remain weak or underdeveloped. In this sense, CEI operates as the organizational conduit through which environmental intentions are transformed into realized competitive outcomes.

At a broader level, the findings are aligned with research emphasizing institutional and contextual enablers of circular strategies. Mora *et al.* [50] highlight the role of policy frameworks and territorial initiatives in supporting circular practices, whereas Wolfaardt *et al.* [51] stress the importance of measurement systems for advancing circularity in agri-food sectors. The present study complements these contributions by showing that such external drivers are most effective when wineries possess internal cognitive alignment and mindfulness that allow them to absorb and operationalize circular strategies through CEI. Accordingly, external support mechanisms appear insufficient in isolation and require firm-level implementation capabilities to translate into competitive benefits. A similar implication emerges from Agnusdei *et al.* [52], who emphasize the relevance of circular ecosystems in the wine sector. The current findings refine this argument by indicating that participation in such ecosystems yields competitive benefits primarily when firms develop strong internal implementation capabilities. Likewise, the results are consistent with firm-level evidence reported by Martínez-Falcó *et al.* [27], who show that environmental awareness and green knowledge sharing enhance sustainable performance in Spanish wineries once they are institutionalized into organizational routines.

Building on this evidence, the present study advances the literature by explicitly modeling CEI as the capability through which GSV and GM are converted into GCA. In doing so, it clarifies that the strategic value of environmental orientation is contingent on its operationalization and may remain underexploited in the absence of effective CEI. In this way, the study extends the NRBV by emphasizing that competitive advantage arises not from cognitive or attitudinal dimensions alone, but from their systematic translation into organizational routines and practices.

From a theoretical perspective, this study confirms that CEI operates as a key mediating mechanism connecting GSV and GM with GCA (RQ1, RQ2, RQ3), demonstrating that wineries capable of aligning a shared environmental vision with mindful awareness can transform sustainability principles into circular practices that reinforce competitiveness and resilience. These results expand the NRBV by defining CEI as a dynamic capability through which cognitive and behavioral orientations toward sustainability become tangible strategic outcomes. Previous research [13-14] emphasized the importance of organizational learning and performance systems in advancing circular transitions, yet this study broadens their scope through empirical validation of the cognitive foundations that sustain these transformations in the wine sector. The integration of GSV and GM

within the NRBV enhances understanding of how collective cognition strengthens strategic alignment, continuous learning, and environmental adaptation. The use of PLS-SEM and IPMA complements this theoretical contribution, identifying CEI as the most influential construct in shaping GCA and revealing which cognitive and operational dimensions offer greater potential for improvement in wineries.

From a managerial perspective, the results offer practical guidance for winery leaders seeking to align competitiveness with sustainability imperatives, as fostering GSV and GM within organizations strengthens a proactive environmental culture that supports CEI and promotes efficient resource use, waste reduction, and improvements in productivity and reputation. In order to operationalize GSV, winery managers should formalize shared environmental objectives through explicit sustainability statements embedded in strategic plans, internal codes of conduct, and annual operational targets. This alignment can be reinforced through cross-functional sustainability committees and steering groups that integrate production, logistics, marketing, and quality management, ensuring that environmental goals are consistently reflected across decision-making levels. This alignment between collective cognition and operational action requires sustained internal dialogue and collaboration across departments, ensuring that environmental objectives are embedded in everyday decision-making and that sustainability becomes a shared organizational priority. From a governance perspective, regular internal reviews of environmental objectives, supported by clear accountability structures and the assignment of environmental responsibilities at managerial and supervisory levels, can enhance the coherence between GSV and operational practices. Training programs that stimulate reflection, adaptive learning, and sustainable process management further reinforce this process, enhancing employee commitment and transforming environmental awareness into measurable performance gains. In this sense, in order to strengthen GM, wineries could implement structured mechanisms that encourage open discussion of environmental issues, such as periodic sustainability briefings, internal reporting channels for environmental incidents or improvement proposals, and incentive systems that recognize employee contributions to environmental knowledge sharing. These practices would help institutionalize mindful attention to environmental challenges and reduce the risk that awareness remains fragmented.

The IPMA results enable a more precise interpretation of how CEI contributes to green competitive advantage, shifting managerial attention from general sustainability

commitments toward clearly prioritized operational actions. The analysis identifies specific CEI practices that are highly relevant for competitive outcomes yet remain insufficiently developed, pointing to well-defined areas where intervention is required. These include the strengthening of product recovery and take-back systems, the redesign of packaging to increase recycled content, and the formalization of procedures for the systematic reuse and valorization of production by-products. Making these gaps explicit may support the definition of concrete improvement objectives and facilitates a more targeted allocation of managerial attention and financial resources toward circular initiatives with direct implications for cost efficiency, environmental performance, and competitive positioning. At a broader level, the findings underscore the role of institutional and governance arrangements in supporting the diffusion and consolidation of CEI across the wine sector. In this regard, PDO schemes and regional wine networks provide established structures for coordination, benchmarking, and peer learning, facilitating the alignment of circular practices and the dissemination of shared standards related to resource efficiency, waste valorization, and environmental management. Through these collective frameworks, wineries can exchange experiences, align operational practices, and develop shared solutions related to waste valorization, water reuse, and reverse logistics. In parallel, policy instruments that link financial support to clearly defined circular performance indicators, together with sustainability certification schemes and training initiatives focused on circular process management, can further reinforce these dynamics.

Despite its contributions, the study presents limitations. The cross-sectional design limits the capacity to capture the temporal evolution of the relationships analyzed, restricting the assessment of long-term effects. Future research should incorporate longitudinal designs to examine how cognitive and behavioral orientations evolve with sustained CEI adoption. Expanding the analysis beyond Spain would also enable comparative evaluation of Old and New World contexts and clarify the influence of cultural and institutional differences on circular transitions. Complementing the quantitative model with qualitative approaches such as case studies or interviews would enrich understanding of managerial mindsets and the internal dynamics through which shared vision and mindfulness strengthen sustainable competitiveness in the wine industry.

An additional limitation concerns the relatively low response rate obtained in the survey and the associated risk of non-response bias. Although response rates of this magnitude

are common in firm-level research within the wine industry, it remains plausible that wineries already engaged in sustainability-oriented or circular practices were more inclined to participate. This circumstance indicates that the empirical evidence may place greater emphasis on the practices and performance of a proactive subset of wineries rather than reflecting average conditions across the Spanish wine industry. This issue is particularly relevant for the interpretation of the IPMA results, as the comparatively high-performance scores observed for several CEI, GSV, and GM indicators should not be interpreted as representative baseline levels for the sector as a whole, but as indicative of more advanced practices among responding firms. As a consequence, a future line of research is proposed that combines survey-based evidence with secondary data sources, sectoral audits, or mandatory reporting frameworks in order to obtain a more comprehensive assessment of the diffusion and maturity of green and circular practices across the Spanish wine industry and to further mitigate the potential effects of non-response bias.

A further limitation concerns the operationalization of CEI in the wine industry. Circular practices in this sector are frequently embedded in packaging systems, by-product valorization processes, and coordinated recycling infrastructures, rather than in firm-controlled product repair and take-back activities. Consequently, CEI in this study reflects wineries' engagement with operational routines and inter-organizational arrangements that support circularity across the value chain, as opposed to direct managerial control over end-of-life processes. Although this operationalization aligns with the institutional and organizational realities of the wine sector, future research could refine measurement approaches to distinguish more clearly between internally managed circular practices and those implemented through municipal systems, thereby further strengthening construct precision.

Future research could also extend the proposed model through the examination of moderating factors that shape both the strength and the effectiveness of the CEI mediation mechanism. Organizational conditions related to leadership orientation, organizational culture, and technological readiness are likely to influence the extent to which GSV and GM are translated into stable circular routines. In this respect, environmentally oriented leadership may facilitate the institutionalization of CEI by reinforcing commitment and coordination around circular objectives, whereas organizational cultures that support learning and collaboration may strengthen the consistency and depth with which circular

practices are implemented. At the same time, variations in technological readiness can affect the efficiency with which environmental awareness is converted into process innovation, product redesign, and resource recovery systems. Accounting for these moderating influences would allow a more comprehensive understanding of the conditions under which CEI most effectively contributes to competitive advantage, thereby extending theoretical developments within the NRBV.

In addition, the conceptual scope of CEI in the wine industry can be broadened to incorporate innovation pathways linked to biological resilience and ecosystem regeneration. The present study focuses on circular practices related to waste reduction, material recovery, and by-product valorization. However, recent contributions increasingly underline the relevance of circular strategies aimed at improving soil health, preserving biodiversity, safeguarding water ecosystems, and enhancing climate resilience in agri-food systems. Within viticulture, this perspective directs attention to regenerative vineyard management practices, adaptive grape varieties, precision agriculture technologies, and nature-based solutions as complementary dimensions of CEI that contribute to long-term ecological stability and competitive positioning. Integrating these elements would allow research to move beyond a predominantly material interpretation of circularity and to examine how CEI supports the resilience of the biological systems on which wine production depends.

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Appendix

A 1. Definition of constructs and measurement indicators

Construct	Items	Author
Control Variables (CV)	CV 1. Is the winery adhered to at least one Protected Designation of Origin?	Martínez-Falcó <i>et al.</i> [20]
	CV 2. When was the winery founded?	
	CV 3. How many employees does the winery have?	
Green Shared Vision (GSV)	GSV 1. There is a shared understanding of environmental goals within the winery.	Scale adapted from Jansen <i>et al.</i> [36]
	GSV 2. There is a high level of agreement regarding the winery's strategic environmental direction.	
	GSV 3. All members of the winery are committed to the winery's environmental strategies.	
	GSV 4. Employees of the winery are enthusiastic about the winery's collective environmental mission.	
Green Mindfulness (GM)	GM 1. Members of the winery feel free to discuss environmental issues and problems.	Scale adapted from Williams and Seaman [37]
	GM 2. Members of the winery are encouraged to express different views regarding environmental issues and problems.	
	GM 3. Members of the winery pay close attention when unexpected environmental issues or problems arise.	
	GM 4. Members of the winery are inclined to report environmental information and knowledge with significant implications.	
	GM 5. Members of the winery are rewarded for sharing and communicating new environmental information and knowledge.	
Circular Economy Implementation (CEI)	CEI 1. The winery designs products to be easily repaired.	Scale inspired by Singh and Ordoñez [38]
	CEI 2. The winery develops products that are biodegradable.	
	CEI 3. The winery offers product repair services to extend product lifespan.	
	CEI 4. The winery uses biodegradable packaging materials.	
	CEI 5. The winery collects products at the end of their useful life.	
	CEI 6. The winery reuses by-products generated during production.	
	CEI 7. The winery incorporates recycled materials into its products.	
Green Competitive Advantage (GCA)	GCA 1. The winery achieves lower costs in environmental management or green innovation compared to its major competitors.	Scale adapted from Lin and Chen [39]
	GCA 2. The quality of the green products or services offered by the winery is superior to that of its major competitors.	
	GCA 3. The winery is more capable of environmental R&D and green innovation than its major competitors.	
	GCA 4. The winery is more capable of environmental management than its major competitors.	

Source: own elaboration