

Article

Expert-Perceived Priorities for Future ESG Adoption Among Kazakhstani SMEs: An AHP-Based Assessment

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Abstract

As ESG considerations increasingly influence access to finance, participation in global supply chains, and long-term competitiveness, understanding which factors experts perceive as most likely to influence future ESG adoption among small and medium-sized enterprises (SMEs) has become an important issue in sustainable finance and corporate management research. While existing studies largely focus on ESG performance, disclosure, and implementation outcomes, limited attention has been paid to the relative importance of competing ESG-related adoption factors in SMEs in Kazakhstan, an emerging-market context, particularly in contexts where ESG adoption remains in its early stages. This study investigates expert perceptions of the factors most likely to shape ESG implementation decisions among SMEs in Kazakhstan. Drawing on Institutional Theory, the Resource-Based View (RBV), and the concept of double materiality, the study applies the Analytic Hierarchy Process (AHP) to evaluate six ESG-related criteria: coercive institutional pressure, normative pressure, organizational capabilities, financial materiality, impact materiality, and internal governance and processes. Expert judgments were collected through pairwise comparisons and aggregated using the geometric mean within a group AHP framework. The aggregated matrix demonstrated acceptable group-level consistency (CR = 0.0193), providing a basis for exploratory interpretation of the aggregated priority structure, while not validating the consistency of all individual judgments. The findings indicate a structured priority pattern among the expert-perceived ESG-related decision factors. The financial dimension received the highest priority weight, followed by coercive and normative pressure. Internal governance occupied an intermediate position, whereas impact materiality and organizational capabilities received nearly identical lower weights. These results suggest that experts expect future ESG adoption among Kazakhstani SMEs to be influenced primarily by financial relevance and regulatory compliance rather than by impact-oriented sustainability objectives or internally developed sustainability capabilities. This study contributes to the literature in three ways. First, it advances understanding of ESG adoption readiness and prioritization mechanisms among SMEs in Kazakhstan, as an emerging-market context, by integrating institutional, resource-based, and materiality-oriented perspectives. Second, it extends the debate on double materiality by suggesting that financially relevant ESG considerations may play a particularly important role in ESG-related decision-making under conditions of resource scarcity and institutional uncertainty. Third, it provides evidence relevant to ESG regulation, sustainable finance, and SME support policies in developing economies. More broadly, the findings suggest that within the Kazakhstani SME context,



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ESG is expected to become financially relevant before it becomes fully internalized as a strategic sustainability practice.

Keywords: small and medium-sized enterprises (SMEs); ESG prioritization; analytic hierarchy process (AHP); double materiality; institutional theory; financial materiality; emerging markets; Kazakhstan; sustainable finance; compliance

1. Introduction

Environmental, social, and governance (ESG) considerations have evolved from a voluntary sustainability initiative into an increasingly influential component of corporate finance, investment decision-making, and supply-chain governance. ESG-related expectations now increasingly influence firms' access to capital, borrowing conditions, investor confidence, regulatory compliance, and participation in international value chains. As financial institutions, multinational corporations, and regulators increasingly integrate ESG criteria into risk assessment and investment frameworks, sustainability is no longer viewed solely as a reputational issue but as a factor that may influence long-term competitiveness and economic resilience. A comprehensive meta-analysis of more than 2000 empirical studies found a predominantly positive relationship between ESG performance and corporate financial performance, highlighting the growing strategic importance of ESG in contemporary business environments (Friede et al., 2015). Similarly, Gillan et al. (2021) argue that ESG has become an increasingly important dimension of corporate finance, influencing investment allocation, stakeholder evaluation, and firm valuation.

Despite this growing attention, much of the ESG literature continues to focus primarily on firms that possess sufficient resources, organizational capabilities, and institutional readiness to respond effectively to sustainability-related expectations. Such assumptions may be more applicable to large listed corporations operating within mature governance environments. However, they are considerably more problematic in the context of small and medium-sized enterprises (SMEs), which often differ from large corporations not only in scale but also in resource availability, managerial capacity, and formal governance infrastructure. Unlike large firms, SMEs frequently face shortages of financial resources, managerial expertise, sustainability-related knowledge, data collection capacity and organizational slack. As a result, sustainability-related decisions in SMEs are often constrained by immediate operational priorities, cost pressures and survival concerns. Johnson and Schaltegger (2016) emphasize that many sustainability management tools were originally designed for large corporations and are often difficult to implement in SME settings. Likewise, Schaltegger et al. (2023) demonstrate that SME managers frequently perceive resource limitations, insufficient expertise, and short-term business pressures as major barriers to sustainability-oriented transformation.

These challenges become even more pronounced in emerging-market economies, including Kazakhstan. SMEs operating in such environments may face a combination of internal resource constraints and external institutional uncertainties, including regulatory heterogeneity, restricted access to sustainable finance, uneven levels of digitalization, and evolving governance infrastructures. Consequently, ESG adoption in such contexts is unlikely to follow a simple, linear path toward compliance with international sustainability standards. Instead, firms are often required to continuously make trade-offs among competing demands, deciding which ESG-related issues deserve immediate attention, which can be postponed, and which are perceived as most relevant to business continuity and future competitiveness.

Kazakhstan provides a particularly relevant context for examining these dynamics. SMEs constitute a critical component of the national economy. According to the Bureau of National Statistics of the Republic of Kazakhstan, SMEs account for approximately 36–37% of national GDP and employ more than 4 million people, representing around 40% of total employment. Consequently, the future sustainability trajectory of the SME sector is closely linked to broader national objectives for economic diversification, innovation, job creation, and long-term development. At the same time, Kazakhstan occupies a strategically important position at the intersection of Europe and Asia and serves as an increasingly significant participant in regional trade corridors, logistics networks, energy exports, and international investment flows. As Kazakhstan becomes more deeply integrated into global supply chains and international capital markets, domestic firms are increasingly exposed to sustainability-related expectations from investors, lenders, multinational partners, and international regulatory frameworks.

However, an important contradiction remains in the Kazakhstani SME context. Although ESG has become increasingly visible in policy discussions and corporate governance debates, ESG adoption among Kazakhstani SMEs remains relatively limited. Existing sustainability reporting and ESG disclosure practices are concentrated primarily among large corporations, state-owned enterprises, financial institutions, and internationally connected firms. Participation of Kazakhstani SMEs in formal ESG initiatives remains comparatively low, and ESG-related practices are not yet widely institutionalized across the broader domestic SME sector. This situation creates an important research challenge. In contexts where ESG implementation is still in its early stages, analyzing current ESG performance alone may offer only a partial understanding of future sustainability trajectories. Equally important is understanding which factors experts perceive as most likely to encourage Kazakhstani SMEs to engage with ESG in the first place.

This distinction is particularly important because the dominant focus of existing research has been on ESG disclosure, sustainability reporting quality, ESG performance measurement, and barriers to implementation. While studies examining SMEs have generated valuable insights into resource constraints, organizational readiness, and sustainability-related challenges, considerably less attention has been paid to the perceived decision-making logic that precedes ESG adoption itself. There is limited information on how SMEs evaluate competing ESG-related factors under financial constraints, institutional pressures, organizational limitations, and differing interpretations of materiality. Consequently, a significant gap remains in understanding the expert-perceived relative importance of the factors expected to shape ESG-related decisions before ESG becomes fully embedded in organizational practice. This regional specificity is also reflected in PwC's analytical reports, which note that a significant imbalance exists in the Eurasian market and in Kazakhstan. While large enterprises are actively integrating this agenda into their strategies, SMEs are still developing a basic understanding of the value of ESG transformation (PwC Kazakhstan, 2024). This underscores the need for a detailed examination of the factors that can motivate SMEs to transition from passively complying with external requirements to making informed choices about sustainable development priorities.

To address this gap, the present study investigates expert perceptions of the factors most likely to influence future ESG adoption decisions among SMEs in Kazakhstan. The study integrates three complementary theoretical perspectives: Institutional Theory, the Resource-Based View (RBV), and the concept of double materiality. Institutional Theory explains how coercive and normative pressures originating from regulators, investors, industry standards, and professional norms influence organizational behavior (DiMaggio & Powell, 1983). RBV emphasizes the role of internal resources and capabilities in enabling firms to respond effectively to strategic challenges and sustain competitive

advantage (Barney, 1991). The concept of double materiality distinguishes between the financial significance of ESG factors for firms and the broader environmental and social impacts generated by corporate activities (Adams et al., 2021; EFRAG, 2024).

Unlike previous studies that primarily focus on ESG implementation barriers or organizational readiness, this research conceptualizes ESG adoption as a prioritization problem involving competing decision-making logics. Specifically, the study examines how experts assess the relative importance of financial materiality, institutional pressure, organizational capabilities, impact materiality, and governance-related factors in shaping anticipated ESG engagement among SMEs. To evaluate these competing factors systematically, the study employs the Analytic Hierarchy Process (AHP), a structured multi-criteria decision-making approach that enables the comparison and prioritization of complex factors based on expert judgments.

This study contributes to the literature in three ways. First, it extends research on ESG adoption readiness among SMEs in Kazakhstan, an emerging-market context by shifting attention from implementation outcomes to the prioritization mechanisms that precede ESG engagement. Second, it develops an integrated analytical framework that combines institutional, resource-based, and materiality-oriented perspectives to explain ESG-related decision-making under conditions of resource scarcity and institutional uncertainty. Third, it contributes to the growing literature on sustainable finance and SME sustainability by providing expert-based evidence regarding the relative roles of financial materiality, institutional pressure, organizational capabilities, and governance considerations in shaping anticipated future ESG adoption priorities in a Central Asian context.

The remainder of the article is organized as follows. Section 2 reviews the relevant literature and develops the theoretical framework. Section 3 presents the research methodology and the application of the Analytic Hierarchy Process. Section 4 reports the empirical findings and discusses their theoretical and practical implications. The final section concludes with the study and outlines directions for future research.

2. Literature Review

2.1. ESG and SMEs in Emerging Markets: From Adoption to Prioritization

Over the past decade, Environmental, Social, and Governance (ESG) considerations have evolved from a largely voluntary corporate responsibility initiative into a strategic business issue that influences access to capital, stakeholder relationships, supply-chain participation, and long-term competitiveness. A growing body of literature suggests that ESG performance increasingly affects firms' financial outcomes, risk exposure, and market valuation (Friede et al., 2015; Gillan et al., 2021). Consequently, ESG is no longer viewed solely as a sustainability concern but also as a factor shaping corporate resilience and strategic positioning in an increasingly uncertain business environment.

While large corporations have been at the center of ESG discussions, the relevance of ESG for small and medium-sized enterprises (SMEs) has received increasing attention in recent years. This shift reflects the growing integration of SMEs into global value chains, sustainable finance systems, and regulatory frameworks. Large multinational corporations, financial institutions, and public procurement systems increasingly require suppliers and business partners to demonstrate compliance with sustainability-related standards. As a result, ESG considerations are gradually becoming a prerequisite for maintaining market access rather than a voluntary reputational exercise.

Previous studies consistently show that SMEs face greater resource and capability constraints than large corporations when engaging with sustainability initiatives. For example, Johnson and Schaltegger (2016) note that many sustainability management tools were

originally designed for larger firms, while [Schaltegger et al. \(2023\)](#) highlight the challenges SMEs face in prioritizing sustainability amid operational pressures and resource scarcity.

These challenges become even more pronounced in emerging economies. SMEs in developing and transition economies often face additional obstacles, including regulatory uncertainty, limited access to finance, weak institutional support mechanisms, and lower levels of technological readiness. Under such conditions, ESG implementation cannot be understood simply as the adoption of international sustainability standards. Instead, it becomes a process of organizational prioritization in which firms must decide which ESG-related demands deserve immediate attention and which can be postponed.

Despite the rapid expansion of ESG research, much of the existing literature focuses on ESG disclosure, sustainability reporting, ESG performance measurement, or barriers to ESG adoption. Comparatively little attention has been paid to a more fundamental question: when SMEs cannot simultaneously address all ESG-related expectations, which factors do they consider most important? Understanding this prioritization process is particularly important in emerging markets, where resource constraints force firms to make strategic trade-offs between competing sustainability demands.

This study argues that ESG implementation should be viewed not only as a matter of adoption but also as a question of prioritization. Before firms can implement ESG practices, they must determine which ESG-related drivers are most relevant to their business reality. Consequently, understanding ESG prioritization represents an important yet underexplored dimension of sustainability management research.

2.2. *Competing Explanations of ESG Prioritization*

Existing literature provides several theoretical explanations for why firms engage with ESG. However, these explanations often emphasize distinct drivers of organizational behavior and yield different predictions about ESG prioritization.

2.2.1. Institutional Theory

Institutional theory suggests that organizations frequently adopt practices not solely because they improve efficiency, but because they enhance legitimacy within their institutional environment ([DiMaggio & Powell, 1983](#)). Organizations operate within broader systems of regulations, professional norms, stakeholder expectations, and social values that shape what is considered appropriate organizational behavior. Within the ESG context, institutional pressures may emerge from multiple sources. Regulatory agencies increasingly introduce sustainability disclosure requirements, environmental standards, and governance expectations. Financial institutions incorporate ESG considerations into lending decisions and risk assessments. Large corporate buyers increasingly require sustainability information from suppliers. At the same time, professional associations, industry standards, and stakeholder expectations create normative pressures encouraging organizations to conform to accepted sustainability practices.

Institutional theory, therefore, predicts that firms may prioritize ESG in response to external pressure. In such situations, ESG implementation becomes a response to compliance requirements, market expectations, and legitimacy concerns rather than an internally driven strategic initiative. This perspective is particularly relevant in emerging economies, where regulatory reforms and international market integration often create new sustainability expectations for firms.

2.2.2. Resource-Based View

While institutional theory emphasizes external pressure, the Resource-Based View (RBV) focuses on internal organizational capabilities. According to [Barney \(1991\)](#), sustainable competitive advantage arises from valuable, rare, inimitable, and organizationally

embedded resources. Hart (1995) further extended this perspective by arguing that environmental and sustainability-related capabilities can themselves become strategic resources. From an RBV perspective, responding to ESG requirements depends not only on external expectations but also on whether organizations possess the capabilities necessary to implement sustainability initiatives. ESG implementation often requires managerial expertise, data management systems, reporting competencies, stakeholder engagement mechanisms, and governance structures that integrate sustainability into organizational decision-making. For SMEs, capability constraints frequently represent a significant barrier. Even when managers recognize the importance of ESG, firms may lack the financial resources, specialized personnel, or organizational systems necessary to implement sustainability practices effectively. Consequently, ESG prioritization may be shaped not only by external pressure but also by firms' perceptions of their own organizational readiness.

2.2.3. Double Materiality Perspective

A third explanation emerges from the growing literature on materiality and sustainability reporting. The concept of double materiality, introduced in European sustainability reporting frameworks, posits that sustainability issues can be material in two distinct but interconnected ways (European Commission, 2023; EFRAG, 2024). Financial materiality focuses on how environmental, social, and governance factors affect a company's financial performance, risks, cash flows, and access to capital. Impact materiality, in contrast, focuses on how a company's activities affect society, stakeholders, and the natural environment. The distinction is particularly important for SMEs operating under resource constraints. When resources are limited, firms may be inclined to prioritize ESG issues that directly influence profitability, financing opportunities, operational risks, or business continuity. In contrast, broader societal and environmental impacts may receive less immediate attention despite their long-term significance. This distinction suggests that ESG prioritization may reflect competing sustainability logics. Some firms may view ESG primarily through the lens of financial survival and economic performance, whereas others may place greater emphasis on broader stakeholders and societal outcomes.

2.3. Research Gap

Although Institutional Theory, the Resource-Based View (RBV), and the concept of double materiality each provide valuable insights into ESG-related decision-making, existing studies typically examine these perspectives in isolation. Institutional research primarily emphasizes external pressures, RBV-based studies focus on internal organizational resources and capabilities, whereas materiality research is largely concerned with sustainability reporting and disclosure frameworks.

Consequently, limited empirical evidence exists on how these complementary perspectives jointly shape ESG prioritization when SMEs operate under conditions of resource constraints and institutional uncertainty. This gap is particularly relevant in emerging-market economies, where firms must balance competing financial, organizational, and institutional considerations when deciding whether and how to engage with ESG.

Kazakhstan provides an appropriate setting for addressing this gap. Although ESG has become increasingly prominent in regulatory initiatives, financial markets, and corporate governance discussions, its adoption among SMEs remains at an early stage. This creates an opportunity to examine how experts assess the relative importance of the factors expected to influence future ESG adoption before sustainability practices become broadly institutionalized within the SME sector.

To address this gap, the present study integrates Institutional Theory, the Resource-Based View, and the Double Materiality perspective into a unified analytical framework. Rather

than examining current ESG implementation, the study investigates expert perceptions of the relative importance of the factors expected to shape future ESG adoption among Kazakhstani SMEs. Using the Analytic Hierarchy Process (AHP), it evaluates six criteria representing institutional pressures, organizational capabilities, and materiality considerations.

3. Conceptual Framework and Research Design

3.1. Conceptual Framework

Building upon the literature reviewed in the previous section, this study conceptualizes ESG prioritization among Kazakhstani SMEs as a prioritization problem shaped by three interconnected decision-making logics: institutional pressure, organizational capability, and materiality considerations.

Existing ESG studies often examine these dimensions separately. Institutional theory emphasizes external pressures arising from regulations and stakeholder expectations, while the RBV focuses on internal organizational capabilities. At the same time, recent sustainability reporting research increasingly relies on the concept of double materiality, which distinguishes between the financial relevance of ESG issues and the impacts of corporate activities on society and the environment.

However, SMEs operating in Kazakhstan and similar emerging-market environments rarely experience these influences independently. Instead, ESG-related decisions emerge from the interplay among regulatory expectations, organizational constraints, financial considerations, and sustainability objectives.

To capture this complexity, the present study integrates Institutional Theory, the Resource-Based View, and the Double Materiality framework into a unified analytical model. These six criteria form the conceptual basis for evaluating expert-perceived ESG prioritization among Kazakhstani SMEs (Table 1).

Table 1. Evaluation Criteria and Operational Definitions.

Code	Criterion	Operational Definition
C1	Coercive Institutional Pressure	Influence of laws, regulations, governmental requirements, lender mandates, and other mandatory ESG-related obligations.
C2	Normative Pressure	Influence of industry standards, stakeholder expectations, investor preferences, professional norms, and market legitimacy concerns.
C3	Organizational Capabilities	Internal resources and competencies required for ESG implementation, including managerial expertise, staff capabilities, analytical capacity, and operational readiness.
C4	Financial Materiality	Perceived impact of ESG issues on financial performance, access to capital, risk exposure, costs, and long-term economic sustainability.
C5	Impact Materiality	Perceived importance of a firm's environmental and social impacts on stakeholders, communities, and the natural environment.
C6	Internal Governance and Processes	The degree to which ESG principles are embedded within governance structures, managerial routines, policies, reporting systems, and accountability mechanisms.

The institutional dimension is represented by criteria C1: Coercive Institutional Pressure and C2: Normative Pressure, which capture the influence of regulations, government requirements, financial institutions, investors, industry standards, stakeholder expectations, and legitimacy-seeking behavior.

The organizational dimension is represented by criteria C3: Organizational Capabilities and C6: Internal Governance and Processes. These criteria reflect managerial expertise, human resources, analytical capacity, organizational readiness, governance structures, and the ability to integrate ESG principles into organizational decision-making.

Finally, the materiality dimension is represented by the next two criteria: C4: Financial Materiality and C5: Impact Materiality, which reflect the two complementary dimensions of

sustainability relevance recognized by contemporary sustainability reporting frameworks. The financial dimension emphasizes business value creation, financial performance, risk management, and access to capital, whereas the impact dimension concerns the broader environmental and social consequences of corporate activities.

The proposed framework assumes that ESG adoption decisions are not determined by a single factor. Rather, SMEs continuously balance institutional expectations, organizational capabilities, and materiality considerations when deciding which sustainability-related actions deserve priority attention.

Figure 1 illustrates the integrated conceptual framework of the study.

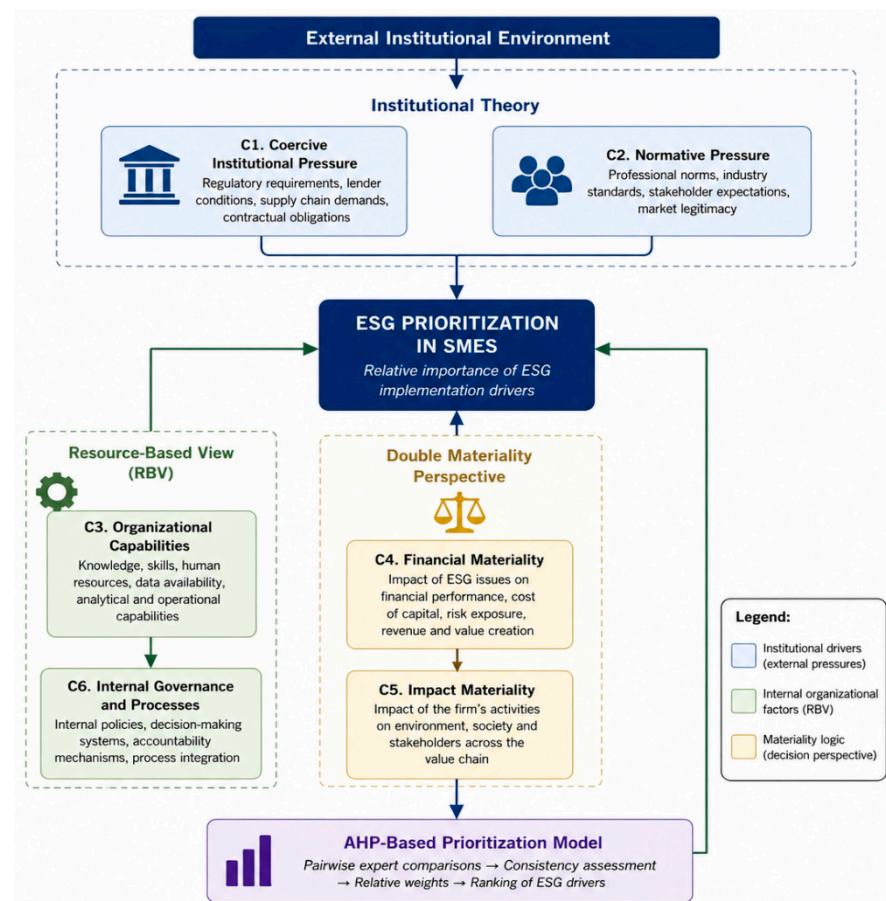


Figure 1. Integrated conceptual framework of ESG prioritization in emerging-market SMEs. The framework combines institutional theory, the resource-based view (RBV), and the double materiality perspective to explain the relative importance of ESG implementation drivers operationalized through an AHP-based prioritization model.

3.2. Research Design

This study adopts an exploratory expert-based research design that combines the Analytic Hierarchy Process (AHP) with qualitative expert interviewing.

The primary objective is to identify and rank the expert-perceived factors most likely to influence future ESG adoption among SMEs in Kazakhstan.

The study addresses the following research question:

Which factors are perceived by experts as the most influential anticipated factors shaping future ESG adoption among SMEs in Kazakhstan?

Given the exploratory nature of the research problem and the limited prevalence of ESG implementation among most Kazakhstani SMEs, expert judgment was considered the appropriate source of evidence for assessing anticipated adoption priorities. Rather than measuring existing ESG performance or directly observing SME behavior, the study

focuses on expert perceptions regarding the relative importance of potential factors shaping future ESG adoption.

The AHP, originally developed by Saaty (1977, 1980), was selected because ESG prioritization represents a multidimensional managerial decision problem characterized by qualitative judgments, competing sustainability logics, institutional uncertainty, and organizational constraints. AHP is particularly suitable for such situations because it converts qualitative pairwise comparisons into quantitative priority weights while simultaneously assessing the consistency of expert judgments. To complement the AHP analysis, a semi-structured expert interview was conducted with an Italian academic expert specializing in regional development, innovation policy, and SME sustainability. The interview was not incorporated into the AHP calculations and therefore did not influence the quantitative weighting results. Instead, it served as contextual and illustrative evidence, providing additional interpretation of the quantitative findings and facilitating comparison between emerging-market and developed-economy contexts.

3.3. Selection of Evaluation Criteria

The six evaluation criteria were derived from the theoretical framework developed in Section 2 and refined through a preliminary review of ESG-related disclosures, annual reports, and sustainability reports of selected SMEs and SME-relevant companies in Kazakhstan and Italy. This document review was used only to ensure that the criteria reflected observable ESG-related issues in practice, such as regulatory pressure, materiality considerations, impact orientation, organizational capabilities, and internal governance processes. It was not used to calculate the AHP weights. The final prioritization was based exclusively on expert pairwise comparisons. Each criterion operationalizes one of the core dimensions underlying expert-perceived ESG prioritization among SMEs in Kazakhstan.

Although some criteria may be related in practice, they were retained as analytically distinct dimensions: institutional pressure refers to external sources of ESG expectations; financial materiality captures perceived business and financial consequences; organizational capabilities refer to internal resources; and internal governance reflects formal processes and accountability mechanisms.

3.4. Expert Panel and Data Collection

The study employed purposive expert sampling because the objective was not statistical representativeness but the collection of informed judgments from individuals with substantial ESG-related expertise, professional experience, and familiarity with ESG developments in Kazakhstan. This approach is consistent with the logic of AHP, which is designed to structure complex decision problems and transform expert pairwise judgments into priority weights rather than to rely on large statistical samples (Saaty, 1980, 2008). In expert-based AHP research, the panel's adequacy depends primarily on the participants' relevance, knowledge, and decision-making experience. The expert panel consisted of six participants representing corporate, consulting, auditing, and academic perspectives (Table 2), reflecting the exploratory and expert-based nature of the study. Professional experience ranged from five to twenty years, allowing the panel to reflect both practical and analytical perspectives on ESG implementation and sustainability-related decision-making.

The diversity of the panel was intended to capture different perspectives on ESG-related decision priorities, including corporate practice, sustainability consulting, auditing experience, and academic expertise.

At the same time, the panel composition represents a limitation of the study. Because three experts were consultants or auditors and only two represented corporate practice, the findings may reflect professional and advisory perspectives more strongly than the

direct views of SME owners or managers. Accordingly, the results are interpreted as expert-perceived priorities rather than direct evidence of actual SME behavior.

Table 2. Characteristics of the Expert Panel.

Expert Code	Professional Background	Years of Experience	Role in ESG-Related Activities
E1	Corporate Representative (CFO/ESG Manager)	15–20 years	Advisory and analytical participation in ESG-related decision-making
E2	Corporate Representative (CFO/ESG Manager)	5–10 years	Research and observational participation in ESG-related activities
E3	Sustainability Consultant/Auditor	15–20 years	Direct participation in ESG policy development, investment decisions, and sustainability consulting
E4	Academic Expert (Professor/Researcher)	15–20 years	Research, analytical assessment, and ESG-related academic expertise
E5	Sustainability Consultant/Auditor	5–10 years	Research and analytical participation in sustainability and ESG projects
E6	Sustainability Consultant/Auditor	10–15 years	Advisory, implementation, and sustainability assessment activities
Total	2 Corporate Representatives, 3 Consultants/Auditors, 1 Academic Expert	5–20 years	Diverse perspectives from business practice, consulting, auditing, and academia

Prior to pairwise comparisons, experts were asked to provide an ordinal ranking of the six criteria by perceived importance. This preliminary ranking exercise served as a cognitive calibration mechanism intended to facilitate subsequent pairwise evaluations by familiarizing experts with the criteria before completing the AHP comparisons.

The pre-ranking exercise was not included in any computational stage of the AHP analysis and was used solely as an orientation tool.

3.5. Ethical Considerations

The study adhered to generally accepted principles of research ethics throughout the data collection process. Participation was voluntary, informed consent was obtained from all participants prior to completing the questionnaire, responses were collected anonymously, and no personally identifiable information was collected. All data were analyzed and reported only in aggregated form to ensure participant confidentiality.

3.6. Pairwise-Comparison Procedure

Experts evaluated the relative importance of the six criteria through pairwise comparisons. To facilitate participation and reduce respondent burden, a simplified five-level response interface was used during data collection. This interface was based on the five main verbal intensity categories of Saaty’s fundamental scale: equal importance, moderate importance, strong importance, very strong importance, and extreme importance (Saaty, 1980, 2008). These categories correspond to the odd-numbered Saaty values 1, 3, 5, 7, and 9, while the even values 2, 4, 6, and 8 are conventionally used only as intermediate judgments between adjacent verbal categories. Accordingly, the questionnaire presented the five main verbal anchors to experts and converted their responses into the corresponding Saaty values before analysis (Table 3). When the preferred criterion appeared in the inverse order of a comparison pair, the reciprocal values (1/3, 1/5, 1/7, 1/9) were assigned automatically to maintain matrix reciprocity. This design simplified the response process for practitioners while preserving the core mathematical properties and verbal-intensity structure of the conventional AHP scale.

Table 3. Conversion of Questionnaire Responses to Saaty Scale.

Questionnaire Response	Saaty Value	Interpretation
1	1	Equal importance
2	3	Moderate importance
3	5	Strong importance
4	7	Very strong importance
5	9	Extreme importance

Similar adaptations of Saaty’s original judgment scale have been discussed in the AHP literature as a means of reducing cognitive burden while preserving the fundamental logic of pairwise comparisons (Ishizaka & Labib, 2011; Goepel, 2019). Consistent with this practical rationale, the present study retained the five principal verbal intensity categories of Saaty’s scale while omitting the intermediate even-numbered values.

For comparisons in which the preferred criterion appeared on the right-hand side of the pair, reciprocal values were assigned to preserve the reciprocal structure of the pairwise-comparison matrix. To enhance methodological transparency, the full questionnaire structure, converted pairwise-comparison matrices, individual consistency diagnostics, aggregated matrix, and final weight calculations are provided in Supplementary File S1.

The aggregated group matrix achieved a Consistency Ratio (CR) of 0.0193, which is substantially below the conventional threshold of 0.10. This result indicates acceptable group-level consistency of the aggregated matrix, providing a basis for exploratory interpretation while not validating the consistency of all individual judgments. Nevertheless, the presence of individual inconsistency is acknowledged as a limitation of the study and should be considered when interpreting the findings.

Because the simplified interface did not include the intermediate even-numbered values (2, 4, 6, and 8), it may have reduced the granularity of expert judgments and limited the ability of experts to express fine distinctions between closely related criteria. In addition, the use of a coarser response scale may have mechanically contributed to lower Consistency Ratios (CRs) by reducing opportunities for minor inconsistencies in pairwise comparisons. Accordingly, although the aggregated CR indicates acceptable consistency, it may partially reflect the use of a coarser response scale in addition to the internal coherence of expert judgments. For this reason, the final ranking was interpreted with caution, and sensitivity analyses were conducted to assess the robustness of the aggregated priority structure.

3.7. AHP Computation and Group Aggregation

For each expert, a positive reciprocal pairwise-comparison matrix was constructed: where each matrix element $a_{ij}^{(k)}$ represents the relative importance assigned by expert k to criterion i compared with criterion j .

$$a_{ij}^{(k)} = \frac{1}{a_{ji}^{(k)}},$$

and

$$a_{ii}^{(k)} = 1$$

Local priority weights were derived within Saaty’s AHP framework by normalizing each column of the comparison matrix and calculating the row average for each criterion. This priority estimation procedure, combined with eigenvalue-based consistency assessment using λ_{max} , follows the standard AHP methodology described by Saaty (1980) and is widely used in applied AHP studies. To verify that the approximation method did not

affect the substantive ranking, the principal eigenvector solution was also calculated and reported in Supplementary File S1.

The principal eigenvector solution produced the same upper-level priority structure as the row-average method: Financial Materiality (C4), Coercive Institutional Pressure (C1), and Normative Pressure (C2) remained the three highest-priority criteria, while Internal Governance and Processes (C6) remained in the intermediate position. The only difference was a minor interchange between Organizational Capabilities (C3) and Impact Materiality (C5), whose weights were nearly identical in both methods. Therefore, the substantive interpretation of the results was not affected by the weight-derivation method. The comparison between the row-average and principal eigenvector priority weights is summarized in Supplementary File S1.

Because the study aims to identify a collective expert-perceived priority structure rather than individual rankings, expert judgments were aggregated using the geometric mean method. Following [Forman and Peniwati \(1998\)](#), the Aggregation of Individual Judgments (AIJ) approach was adopted because the study aggregated expert pairwise judgments before deriving the final group priority weights.

The aggregated value for each matrix element was calculated as:

$$a_{\{ij\}}^{\{(G)\}} = \left(\prod_{\{k=1\}}^{\{m\}} a_{\{ij\}}^{\{(k)\}} \right)^{\{\frac{1}{m}\}}$$

where $a_{ij}^{(G)}$ denotes the aggregated group judgment for criteria i and j , m denotes the number of experts, and $a_{ij}^{(k)}$ denotes the judgment provided by expert k .

To improve methodological transparency, the full questionnaire structure, converted pairwise-comparison matrices, individual consistency diagnostics, aggregated matrix, and final weight calculations are provided in Supplementary File S1.

3.8. Consistency Assessment

The consistency of the pairwise-comparison matrices was assessed at both the individual and aggregated group levels following the standard procedure proposed by [Saaty \(1980\)](#). Consistency was evaluated using the Consistency Index (CI) and the Consistency Ratio (CR), calculated as:

$$CI = \frac{\lambda_{max} - n}{n - 1}$$

$$CR = \frac{CI}{RI}$$

where λ_{max} represents the maximum eigenvalue of the comparison matrix, n denotes the number of criteria, and RI is the corresponding Random Index value.

For the six-criterion matrix used in this study, the RI value equals 1.24. The aggregated group matrix yielded $\lambda_{max} = 6.1198$, $CI = 0.0240$, and $CR = 0.0193$, which is below the commonly accepted threshold of 0.10. This result indicates acceptable internal consistency of the aggregated group matrix. However, the interpretation of the group-level CR requires consideration of the consistency of the underlying individual judgments.

At the individual respondent level, four expert matrices produced Consistency Ratios (CRs) above the conventional 0.10 threshold. These values indicate that some individual judgments exhibited a degree of inconsistency, which is not uncommon in exploratory expert-based AHP studies addressing complex and multidimensional sustainability issues. Although four experts exceeded the 0.10 threshold, all individual CR values remained below 0.20, suggesting that the observed inconsistencies were moderate rather

than extreme. In line with the objective of this study, the analysis focuses on the collective expert-perceived priority structure rather than individual expert preferences. Because data collection was based on a one-time anonymous expert survey, iterative revision of inconsistent judgments, as recommended by Saaty (1980), was not feasible. Consequently, the original pairwise-comparison matrices were retained and aggregated using the Aggregation of Individual Judgments (AIJ) approach based on the geometric mean method (Forman & Peniwati, 1998). It should be noted, however, that a low group-level Consistency Ratio (CR) does not imply that all individual judgments were themselves fully consistent. As recognized in the AHP literature, aggregation through the geometric mean may produce a highly consistent aggregated matrix even when several individual pairwise-comparison matrices exhibit moderate inconsistency. Therefore, the group-level CR is interpreted as an indicator of the internal coherence of the aggregated priority structure rather than as validation of every individual expert judgment. For transparency, all individual pairwise-comparison matrices and their corresponding consistency diagnostics are provided in Supplementary File S1.

Because some individual matrices exceeded the conventional consistency threshold, additional sensitivity analysis was conducted to evaluate the robustness of the aggregated priority structure under alternative aggregation scenarios.

3.9. Sensitivity Analysis

To assess the stability of the aggregated priority structure and to examine whether the final results were disproportionately influenced by any single expert, a leave-one-out sensitivity analysis was conducted. This procedure is particularly relevant for exploratory expert-based AHP studies with a small expert panel, where individual judgments may vary because of differences in professional background, institutional exposure, and strategic interpretation of the decision problem.

The leave-one-out procedure consisted of seven recalculations of the group AHP model. First, the baseline model was calculated using all six experts. Then, six additional scenarios were constructed by excluding one expert at a time. In each scenario, the remaining expert matrices were re-aggregated using the geometric mean method, priority weights were recalculated using the normalized matrix and row-average method, and group-level consistency was reassessed through λ_{max} , CI , and CR .

The purpose of this sensitivity analysis was not to replace the main aggregated AHP results, but to evaluate the rank stability of the final priority structure. Particular attention was paid to whether the highest-ranked criteria remained stable across scenarios and whether lower-ranked criteria showed substantial rank variation. The full leave-one-out calculations, including recalculated weights, rankings, and consistency ratios for each scenario, are provided in Section 4.4 and Supplementary File S1.

4. Results

4.1. Consistency and Reliability of Expert Judgments

The aggregated group comparison matrix demonstrated acceptable group-level logical consistency. Table 4 shows that the maximum eigenvalue (λ_{max}) was 6.1198, resulting in a consistency index (CI) of 0.024. Using Saaty's random index value (1.24) for a six-criterion matrix, the resulting CR was 0.0193. Since this value is substantially below the conventional threshold of 0.10, the expert panel's collective judgments can be considered sufficiently consistent for exploratory interpretation.

Table 4. Consistency Diagnostics of the Aggregated Group Matrix.

Indicator	Value
λ_{max}	6.1198
CI	0.0240
RI	1.24
CR	0.0193

The CR value is substantially below the commonly accepted threshold of 0.10 proposed by Saaty (1980), indicating acceptable logical consistency at the aggregated group level. Consequently, the aggregated priority structure is suitable for exploratory interpretation.

4.2. Aggregate Priority Structure of Expert-Perceived ESG Adoption Factors

The final AHP results indicate a structured pattern of expert-perceived priorities regarding anticipated ESG adoption factors among Kazakhstani SMEs. Table 5 presents the final weights and rankings of the six evaluation criteria.

Table 5. Final weights and rankings of expert-perceived ESG adoption factors.

Code	Criterion	Weight	Rank
C4	Financial Materiality	0.2728	1
C1	Coercive Institutional Pressure	0.2199	2
C2	Normative Pressure	0.1622	3
C6	Internal Governance and Processes	0.1230	4
C5	Impact Materiality	0.1112	5
C3	Organizational Capabilities	0.1108	6

The results indicate that experts perceive financial considerations as the most important anticipated factor shaping ESG adoption among Kazakhstani SMEs. Financial Materiality received the highest weight (0.2728), suggesting that sustainability-related decisions are most likely to be prioritized when they are perceived to influence business performance, access to financing, risk exposure, operational costs, or long-term competitiveness.

The second- and third-highest-ranked criteria were Coercive Institutional Pressure (0.2199) and Normative Pressure (0.1622), respectively. Together, these findings highlight the perceived importance of the external institutional environment in shaping ESG adoption decisions. Regulatory requirements, lender expectations, investor demands, supply-chain obligations, professional standards, and stakeholder expectations appear to exert a stronger influence on ESG adoption than internally generated sustainability initiatives do.

Internal Governance and Processes occupied an intermediate position (0.1230), indicating that governance mechanisms are perceived as important supporting conditions for ESG implementation, but not as the primary triggers of adoption.

By contrast, Impact Materiality (0.1112) and Organizational Capabilities (0.1108) received nearly identical lower weights. These findings suggest that environmental and social impact considerations, as well as internal organizational readiness, are currently perceived as belonging to a lower-priority cluster in motivating ESG adoption among SMEs operating in Kazakhstan.

4.3. Financial and Institutional Logic Versus Sustainability Logic

To better understand the overall structure of expert priorities, the six criteria were grouped into three broader conceptual dimensions derived from the theoretical framework:

1. Institutional Pressure (C1 + C2).
2. Organizational Capacity (C3 + C6).

3. Double Materiality (C4 + C5).

The aggregated weights of these dimensions are presented in Table 6.

Table 6. Aggregated weights by theoretical dimension.

Dimension	Criteria	Combined Weight
Double Materiality	C4 + C5	0.3840
Institutional Pressure	C1 + C2	0.3821
Organizational Capacity	C3 + C6	0.2338

The results demonstrate that expert-perceived ESG adoption priorities are shaped mainly by financial relevance and institutional pressure. Although the aggregated Double Materiality dimension (38.4%) and Institutional Pressure (38.2%) received nearly identical overall weights, the Double Materiality dimension is driven predominantly by Financial Materiality (0.273), whereas Impact Materiality contributes substantially less (0.111). Therefore, the apparent balance between these two theoretical dimensions should not be interpreted as indicating equal importance of the two components of double materiality. Organizational Capacity accounted for less than one-quarter of the total priority structure.

Similarly, within the institutional dimension, Coercive Institutional Pressure received considerably greater emphasis than Normative Pressure. These patterns suggest that future ESG adoption among Kazakhstani SMEs is more likely to emerge through financially relevant incentives and formal institutional requirements than through internally driven sustainability commitments.

4.4. Sensitivity Analysis

To assess the stability of the aggregated priority structure, a leave-one-out sensitivity analysis was conducted. In this procedure, the group AHP model was recalculated seven times: once using all six experts and six additional times by excluding one expert at a time. For each scenario, the aggregated comparison matrix was reconstructed using the geometric mean method, priority weights were recalculated using the normalized matrix and row-average method, and group consistency was reassessed using λ_{max} , CI , and CR .

The results are presented in Table 7. The leave-one-out analysis shows that the overall priority structure remained relatively stable at the upper level. The two leading criteria—Financial Materiality (C4) and Coercive Institutional Pressure (C1)—retained the highest positions across all scenarios. In six of the seven recalculations, C4 remained the top-ranked criterion. Only the exclusion of Expert E6 reversed their order, placing C1 first and C4 s. This indicates that the dominant importance of financial relevance and institutional pressure is not driven by a single expert.

Normative Pressure (C2) also showed relatively stable positioning, ranking third in most scenarios. By contrast, the lower-ranked criteria—Organizational Capabilities (C3), Impact Materiality (C5), and Internal Governance and Processes (C6)—showed greater variation in rank across scenarios. This suggests that the lower part of the ranking should be interpreted cautiously as a cluster of relatively similar priorities rather than as a strict hierarchy. All leave-one-out group matrices produced CR values below the conventional 0.10 threshold, indicating acceptable group-level consistency across sensitivity scenarios.

Detailed λ_{max} , CI , and CR values for each sensitivity scenario are provided in Supplementary File S1.

Table 7. Leave-One-Out Sensitivity Analysis of AHP Priority Weights.

Scenario	C1	C2	C3	C4	C5	C6	Rank Order
All experts	0.220	0.162	0.111	0.273	0.111	0.123	C4 > C1 > C2 > C6 > C5 > C3
Without E1	0.223	0.178	0.101	0.282	0.098	0.12	C4 > C1 > C2 > C6 > C3 > C5
Without E2	0.231	0.166	0.12	0.315	0.087	0.081	C4 > C1 > C2 > C3 > C5 > C6
Without E3	0.199	0.18	0.1	0.261	0.119	0.142	C4 > C1 > C2 > C6 > C5 > C3
Without E4	0.197	0.16	0.118	0.226	0.134	0.166	C4 > C1 > C6 > C2 > C5 > C3
Without E5	0.173	0.147	0.126	0.297	0.134	0.123	C4 > C1 > C2 > C5 > C3 > C6
Without E6	0.3	0.142	0.101	0.247	0.098	0.112	C1 > C4 > C2 > C6 > C3 > C5

In addition to the leave-one-out sensitivity analysis, a targeted robustness check was conducted by excluding the expert matrix with the highest individual CR and, subsequently, the two expert matrices with the highest individual CR values (Table 8). This additional check was included because individual inconsistency may influence aggregated AHP results even when the group-level CR is low. The recalculated results show that Financial Materiality (C4) and Coercive Institutional Pressure (C1) remained the two highest-priority criteria in both targeted exclusion scenarios. The recalculated group-level CR values also remained below the conventional 0.10 threshold. This indicates that the upper-level priority structure is not driven by the most inconsistent individual judgments.

Table 8. Targeted Robustness Check Excluding Highest-CR Expert Matrices.

Scenario	C1	C2	C3	C4	C5	C6	Rank Order	λ_{max}	CI	CR
All experts	0.22	0.162	0.111	0.273	0.111	0.123	C4 > C1 > C2 > C6 > C5 > C3	6.1198	0.024	0.0193
Excluding E2	0.231	0.166	0.12	0.315	0.087	0.081	C4 > C1 > C2 > C3 > C5 > C6	6.1964	0.0393	0.0317
Excluding E2 and E3	0.205	0.198	0.113	0.303	0.092	0.088	C4 > C1 > C2 > C3 > C5 > C6	6.2636	0.0527	0.0425

4.5. Emerging Pattern of Expert-Perceived ESG Adoption Priorities in Kazakhstani SMEs

Taken together, the results reveal a coherent pattern of expert-perceived ESG prioritization.

Experts perceive financial relevance as the most important anticipated factor shaping future ESG adoption among Kazakhstani SMEs. Institutional mechanisms, including regulatory requirements and lender expectations, are also perceived as influential drivers of ESG engagement. Internal governance structures appear to play a supporting role in implementation, whereas impact-oriented sustainability considerations and organizational capabilities occupy a lower-priority position within the expert-perceived priority structure.

Overall, the findings may be interpreted as suggesting a possible sequential pathway in which financial incentives and institutional pressures act as the primary triggers, governance mechanisms facilitate organizational adaptation, and broader sustainability objectives become more relevant only at later stages of ESG development.

5. Discussion

The findings should be interpreted in light of Kazakhstan's evolving ESG environment, where ESG practices remain concentrated primarily among large firms, financial institutions, and internationally connected companies rather than across the broader SME sector.

The AHP results reveal a structured pattern of expert-perceived priorities. Rather than being driven by a single factor, ESG engagement appears to be shaped by a combination of economic relevance, institutional pressures, governance mechanisms, and organizational conditions. The resulting priority structure suggests that ESG is expected to enter Kazakhstani SMEs primarily through financial relevance and external requirements rather than through already embedded sustainability values or impact-oriented strategic transformation.

The findings are broadly consistent with previous SME sustainability research, which shows that SMEs rarely approach sustainability in the same way as large corporations. Prior studies emphasize that smaller firms often face limited financial resources, insufficient managerial expertise, weak reporting infrastructure, and short-term operational pressures, which constrain their ability to adopt formal sustainability tools (Johnson & Schaltegger, 2016; Baumann-Pauly et al., 2013). Similarly, Revell and Blackburn (2007) and Williamson et al. (2006) show that sustainability-related action in SMEs is frequently shaped by business relevance, regulatory pressure, customer expectations, and resource availability rather than by general sustainability commitments alone. The present study extends this literature by showing that, in the Kazakhstani SME context, experts expect ESG adoption to be prioritized first through financial materiality and institutional pressure.

The results also differ from recent European SME ESG research, where ESG adoption is often discussed within more developed support ecosystems, including regulatory guidance, training programs, consulting networks, and sustainability reporting tools. Recent cross-country evidence on European SMEs suggests that ESG engagement is shaped not only by regulation and finance but also by ecosystem maturity, learning mechanisms, and support infrastructure (Gallagher et al., 2026). In contrast, the Kazakhstani context appears to represent an earlier stage of ESG institutionalization, where SMEs are more likely to respond to financial and compliance-related pressures before developing internally embedded sustainability routines. Gallagher et al. also emphasize training, simplified guidance, financial incentives, and networks as supports that help SMEs move beyond reactive compliance, which supports the practical implications discussed later in this paper. One of the central findings concerns the dominance of the financial dimension within the priority structure.

It indicates that experts expect SMEs to engage with ESG when sustainability-related issues are linked to financing opportunities, borrowing conditions, operational risks, market access, supply-chain participation, and long-term competitiveness. This result is consistent with international SME sustainability literature, which shows that smaller firms often evaluate sustainability initiatives in terms of business relevance, resource constraints, and survival logic rather than abstract sustainability commitments (Johnson & Schaltegger, 2016; Schaltegger et al., 2023; OECD, 2023). Therefore, ESG is more likely to become managerially meaningful for SMEs when it affects financing, competitiveness, continuity, or access to customers.

This interpretation is also consistent with Kazakhstan-specific evidence. Maerdan et al. (2026), in their study of ESG maturity and firm valuation in Kazakhstan, found that ESG maturity is more visibly reflected in firm value within the financial sector than in non-financial sectors. This suggests that ESG-related value creation in Kazakhstan is currently more strongly connected to financial-market mechanisms, investor confidence, and governance-related institutional channels than to broad-based sustainability transformation across the economy. This evidence is consistent with the priority structure identified in the present study, where economically relevant considerations received greater emphasis than broader sustainability impacts.

The identified priority structure may also be interpreted through the broader lens of decision-making under uncertainty. In emerging-market environments characterized by limited resources, evolving regulatory frameworks, and information asymmetries, organizations may rely more heavily on external signals when evaluating strategic priorities. Although Erol and Dogan (2024) examine herding behavior in equity markets rather than SME ESG decision-making, their findings illustrate how decision-makers operating under uncertainty may rely on external signals. By analogy, the observed prominence of financial

relevance and institutional pressure suggests that SMEs may similarly rely on external regulatory and institutional signals when prioritizing ESG adoption.

In other words, ESG appears to create clearer value where financial and institutional channels are more developed, while broader environmental and social impacts may remain less visible in managerial decision-making.

Another central finding concerns the high priority assigned to Coercive Institutional Pressure. From the perspective of Institutional Theory, organizations often adopt new practices not only because they improve efficiency, but because external institutions define what is legitimate, necessary, or expected (DiMaggio & Powell, 1983; Scott, 2014). The results suggest that future ESG adoption among Kazakhstani SMEs will be shaped by regulatory requirements, lenders' expectations, procurement rules, investor conditions, and supply-chain obligations. This is especially important in Kazakhstan, where ESG-related development has been promoted largely through financial-sector reforms, sustainable finance initiatives, disclosure guidance, and institutional modernization led by actors such as AIFC, AFSA, ARDFM, and financial regulators.

This Kazakhstan-specific institutional setting helps explain why Coercive Institutional Pressure ranked higher than Normative Pressure. In mature ESG environments, firms may respond to reputational concerns, stakeholder expectations, voluntary sustainability norms, and market legitimacy. In Kazakhstan, however, ESG has not yet become fully embedded as a broad social or business norm within the SME sector. As a result, formal requirements, lender conditions, investor expectations, and supply-chain pressures are expected to play a stronger role than voluntary normative commitments. ESG, therefore, appears to be diffusing through a top-down and compliance-oriented pathway rather than through a bottom-up sustainability culture.

The relatively low weight assigned to Impact Materiality is therefore understandable when considered in the context of Kazakhstan's early-stage SME ESG landscape. Contemporary double materiality frameworks emphasize that companies should consider both how sustainability issues affect the firm and how the firm affects society and the environment (Adams et al., 2021; European Commission, 2023; EFRAG, 2024). However, the results suggest that these two dimensions of materiality may not yet be equally salient for Kazakhstani SMEs. Experts appear to expect SMEs to prioritize ESG only when it becomes financially relevant, while environmental and social impact considerations remain in a lower-priority cluster. This does not mean that environmental and social impacts are irrelevant. Rather, it suggests that impact-oriented sustainability has not yet become the primary language through which SMEs are expected to understand and prioritize ESG.

This finding contributes to the double materiality literature by showing that financial and impact materiality may not emerge simultaneously in resource-constrained emerging-market SME contexts. In Kazakhstan, financial materiality appears to function as the entry point for ESG adoption, while impact materiality may become more important only at a later stage of ESG maturity. This is consistent with the broader pattern observed in Kazakhstan, where ESG development is still strongly linked to financial modernization, investment attractiveness, disclosure, and governance, rather than to deeply embedded impact-oriented sustainability practices.

The low weight of Organizational Capabilities also requires careful interpretation. From the Resource-Based View, organizational resources and capabilities are essential for strategic transformation and sustained competitive advantage (Barney, 1991; Hart, 1995). ESG implementation requires managerial knowledge, data systems, reporting procedures, internal coordination, sustainability expertise, and the ability to integrate sustainability into everyday decision-making. However, Organizational Capabilities received one of the lowest weights in the AHP results, almost identical to Impact Materiality. This does not

imply that capabilities are unimportant. Instead, it suggests that experts do not expect capability development to be the initial trigger of ESG adoption among Kazakhstani SMEs. Rather, organizational capabilities may serve as enabling conditions that become more important when SMEs face financial, regulatory, or supply-chain pressures.

In practical terms, many SMEs may not yet have sufficient ESG knowledge, reporting infrastructure, trained personnel, or analytical capacity to treat ESG as an internally driven strategic agenda. ESG is expected to arrive first through external pressures and financial incentives. Only after firms face financing, regulatory, or supply-chain requirements will they begin to develop the internal capabilities needed for implementation. Therefore, organizational capabilities should be understood as enabling conditions that arise from ESG pressure rather than as primary drivers of adoption at this stage.

The qualitative interview with the Italian academic expert provides contextual and illustrative support for this interpretation. The interview suggested that SMEs often lack the critical mass needed to pursue long-term sustainability transformation. Even in a more mature European institutional environment, SMEs may focus on immediate operational needs, short-term survival, and resource constraints rather than on integrating strategic sustainability. This observation is consistent with the lower priority assigned to Organizational Capabilities in the AHP results. At the same time, the comparison with Italy highlights an important contextual difference: European SMEs, including Italian SMEs, often operate within stronger support ecosystems composed of business associations, public development agencies, training providers, consulting networks, public incentives, and institutional guidance. For instance, organizations such as CONFAPI represent and support Italian small and medium-sized industrial firms through services related to training, credit and taxation, innovation, environmental and energy issues, and territorial business representation. Similarly, Invitalia, as Italy's national agency for investment attraction and enterprise development, manages incentive schemes and business support instruments for new firms, start-ups, innovation, and enterprise growth. These institutional support mechanisms may help SMEs move from reactive compliance to more structured capability building. In Kazakhstan, comparable SME-oriented ESG support mechanisms remain less developed, which may increase the relative importance of financial incentives and coercive institutional pressure.

Internal Governance and Processes occupied an intermediate position in the priority hierarchy. This suggests that governance is beginning to matter, but it is not yet the main driver of ESG adoption. SMEs may recognize that ESG requires internal procedures, accountability mechanisms, reporting routines, and managerial responsibility. However, these governance systems are likely to emerge as responses to external pressure rather than as proactive sustainability strategies. Governance, therefore, functions as a bridge between external ESG demands and internal organizational adaptation.

Taken together, the findings suggest that ESG adoption among Kazakhstani SMEs may be interpreted as a possible staged pathway. Experts perceive that ESG is likely to become relevant initially through Financial Materiality, as sustainability issues become associated with financing opportunities, competitiveness, risk management, and business continuity. Coercive Institutional Pressure may subsequently reinforce ESG-related engagement through regulatory requirements, lender expectations, and supply-chain obligations. Internal Governance and Processes may facilitate organizational adaptation as firms respond to these external pressures. Organizational Capabilities and Impact Materiality appear to occupy a lower-priority position within the expert-perceived structure and may become more salient only as ESG becomes more institutionalized within the SME sector.

Based on the expert-perceived priority structure identified in this study, we tentatively propose an interpretative “Kazakhstan ESG Priority Pyramid” as a heuristic framework

for understanding ESG implementation priorities among SMEs. However, this framework should be understood as an interpretative proposition rather than an empirically established developmental model. At the top of the current priority structure is Financial Materiality, because ESG is first translated into the language of business value and financial relevance. The second layer consists of institutional pressure, especially coercive pressure, because ESG reaches SMEs mainly through external requirements. The third layer is internal governance, which represents the beginning of organizational adaptation. The lowest layer comprises organizational capabilities and impact materiality, which remain underdeveloped yet are essential for future sustainability transformation.

The leave-one-out sensitivity analysis further supports a cautious interpretation of the findings. Financial Materiality (C4) and Coercive Institutional Pressure (C1) remained the two highest-priority criteria across all sensitivity scenarios, although their internal order changed in one scenario. This suggests that the upper-level priority pattern is not driven by a single expert judgment. By contrast, Organizational Capabilities (C3), Impact Materiality (C5), and Internal Governance and Processes (C6) showed greater rank variation, which confirms that the lower-ranked criteria should be interpreted as a lower-priority cluster rather than as a strict hierarchy.

Theoretically, this study suggests that ESG diffusion in emerging-market SMEs should not be understood as the direct transfer of global sustainability standards into local firms. Instead, ESG undergoes institutional translation. Global ESG ideas are adapted to local financial conditions, regulatory structures, organizational limitations, and market realities. In Kazakhstan, this translation process currently produces a financialized and compliance-oriented ESG logic. ESG is not rejected, but it is interpreted through the priorities that matter most to SMEs: finance, survival, market access, and external requirements.

The findings have several practical implications. For policymakers, the results suggest that SME-oriented ESG policy should not simply replicate large-company reporting requirements. Instead, simplified ESG reporting templates, sector-specific guidance, and phased compliance tools are needed to reduce administrative burden for SMEs. For financial institutions, ESG can be made more actionable through green credit lines, sustainability-linked loans, preferential lending conditions, and advisory services that connect ESG improvements to financing opportunities. For business associations and development agencies, the priority should be capability building through training programs, ESG toolkits, peer learning networks, and practical reporting templates. For SMEs, the results suggest that ESG implementation may begin most effectively with financially material issues, such as energy efficiency, cost reduction, access to finance, risk management, and customer requirements, before gradually expanding toward governance routines and impact measurement. Finally, large buyers and supply-chain partners should avoid imposing complex ESG templates designed for large corporations and should instead provide proportionate, SME-sensitive ESG requirements.

Overall, the results show that ESG has not yet been fully internalized within the Kazakhstani SME sector. It is better understood as an emerging institutional agenda whose future diffusion is expected to begin through financial relevance and external compliance pressure. This does not weaken the importance of ESG. Rather, it clarifies the realistic pathway through which ESG may enter SMEs in Kazakhstan: first as a financial and institutional requirement, later as a governance practice, and only gradually as a broader sustainability and impact-oriented management philosophy.

Limitations and Future Research

Several limitations should be acknowledged. First, the study is based on a small expert panel of six respondents. Although this is acceptable for an exploratory expert-based

AHP design, the findings should not be interpreted as statistically representative of all Kazakhstani SMEs. Second, the study captures expert perceptions rather than direct evidence from SME owners, managers, or firm-level ESG practices. Third, several individual expert matrices showed consistency ratios above the conventional threshold, although all individual consistency diagnostics are transparently reported in Supplementary File S1, and the aggregated group matrix demonstrated acceptable consistency. Fourth, while the criteria were treated as analytically distinct for AHP purposes, some may interact in practice. For example, coercive institutional pressure may increase financial materiality through lender requirements, and internal governance may overlap with organizational capability development. Fifth, the qualitative interview with the Italian academic expert was used only as contextual and illustrative evidence, not as a validation mechanism. Finally, the single-country focus on Kazakhstan limits the generalizability of the findings to other emerging markets. Future research should examine these findings through surveys and interviews with SME owners and managers, sector-specific analyses, longitudinal studies of ESG adoption, and comparative research across emerging-market economies.

6. Conclusions

The starting point of this study was the observation that, although ESG has become a prominent topic in global business, finance, and policymaking, it remains only partially integrated into the day-to-day reality of most SMEs in Kazakhstan. Discussions about ESG are increasingly visible among regulators, financial institutions, stock exchanges, and large corporations, yet less is known about how smaller firms perceive ESG and which factors experts expect to shape their future adoption decisions.

The findings suggest that ESG has not yet become an internally embedded management philosophy within the Kazakhstani SME sector. Instead, experts consistently associated future ESG adoption with factors linked to finance, market access, compliance requirements, and institutional expectations. Financial Materiality received the highest expert-assigned priority weight, followed by Coercive Institutional Pressure and Normative Pressure. By contrast, Impact Materiality and Organizational Capabilities formed a lower-priority cluster in the expert assessment.

These results provide insight into the current stage of ESG development in Kazakhstan. For many SMEs, ESG is not yet understood primarily as a mechanism for generating positive environmental or social outcomes. Rather, it appears to be interpreted through a more immediate and pragmatic lens. Experts expect firms to pay attention to ESG when it affects financing opportunities, customer access, participation in supply chains, regulatory compliance, or long-term business stability. In this sense, ESG enters the SME agenda not primarily through sustainability ideals, but through economic relevance.

At the same time, the results suggest that external institutions play a critical role in shaping future ESG adoption. The relatively high priority assigned to Coercive Institutional Pressure indicates that SMEs are expected to respond more strongly to formal requirements and market expectations than to voluntary sustainability norms. This finding reflects the broader characteristics of ESG development in Kazakhstan, where many ESG-related initiatives have been promoted through financial-sector reforms, disclosure frameworks, and sustainable finance programs rather than through long-established sustainability traditions within the business community.

One important implication of this study is that ESG adoption in emerging-market SMEs may not follow the pathway often assumed in international sustainability frameworks. The expert-based evidence presented here suggests a more gradual process. ESG first becomes relevant because of financial considerations and institutional requirements. Only later, after firms begin adapting to these pressures, may governance systems, or-

ganizational capabilities, and broader impact-oriented sustainability concerns start to develop. Rather than appearing simultaneously, different dimensions of ESG may emerge sequentially as firms move through different stages of organizational maturity.

Viewed from this perspective, ESG diffusion should not be understood as a simple transfer of global sustainability standards into local firms. Instead, ESG undergoes institutional translation. Global concepts are interpreted through local realities, resource limitations, institutional structures, and market conditions. The Kazakhstani case suggests that sustainability ideas may not be adopted in their original form but are instead reshaped into forms that firms perceive as economically meaningful and organizationally feasible.

Although this study focuses on Kazakhstan, the findings may have cautious relevance for other emerging economies facing similar institutional and developmental conditions. For policymakers, the results highlight the importance of creating practical incentives and support mechanisms rather than relying exclusively on reporting requirements or compliance obligations. For researchers, the findings suggest that greater attention should be paid to how ESG is interpreted, adapted, and prioritized in contexts where sustainability remains an emerging rather than fully institutionalized practice.

Ultimately, the study argues that understanding ESG adoption requires moving beyond the question of whether firms support sustainability and toward a deeper understanding of why sustainability becomes relevant in the first place. In the case of Kazakhstani SMEs, ESG is expected to begin not primarily as a sustainability project, but as a response to financial realities and institutional expectations. Whether this initial engagement eventually evolves into a deeper commitment to environmental and social impact remains an open question for future research.

Supplementary Materials: The following supporting information can be downloaded at <https://www.mdpi.com/article/10.3390/jrfm19070523/s1>. Supplementary File S1: AHP calculation workbook, including the questionnaire structure, converted pairwise-comparison matrices, individual consistency diagnostics, the aggregated matrix, final priority weights, and a leave-one-out sensitivity analysis.

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