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Sustainable Development and Tech-SMEs Performance in China

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Abstract

This research examines the impact of economic, social, and environmental sustainability dimensions on the performance of tech-based SMEs within the Sichuan–Chongqing economic region. Drawing on 371 valid survey responses and employing Structural Equation Modeling (SEM) via Smart-PLS, the results reveal that each of the three sustainability dimensions exerts a positive impact on organizational performance. The findings offer empirical validation for Dynamic Capability Theory and yield actionable implications for strategic planning and sustainability policymaking in the SME sector. The study also acknowledges its limitations and outlines potential avenues for future investigation.

Keywords: Organizational Performance; Sustainability development; Tech SMEs; Dynamic Capability

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1.0 Introduction

In recent years, sustainable development has become a crucial strategic priority for organizations striving to balance growth, innovation, and social responsibility (Porter & Kramer, 2019). For small and medium-sized enterprises (SMEs), particularly those within the technology sector, sustainability represents not only a moral or legal duty but also a key driver of competitive advantage (Zhang & Wang, 2022). While much research has explored the impact of sustainability on large corporations (Carroll & Shabana, 2020; Liu et al., 2021), there remains a limited understanding of how sustainability practices affect performance outcomes in tech-based SMEs, especially in emerging regions like the Sichuan–Chongqing economic zone, where resources are more constrained. Sustainable development—encompassing economic, social, and environmental dimensions—has become essential for enhancing organizational performance and long-term viability. Technology-based SMEs in the Sichuan–Chongqing economic circle face unique sustainability challenges due to limited resources and rapid industrialization. While the importance of sustainability is widely recognized, its specific impact on SME performance in this region remains underexplored. Most prior research focuses on prominent firms or single sectors, highlighting the need for localized, SME-focused studies. The overarching aim of this study is to examine how sustainable development practices—encompassing the economic, social, and environmental dimensions—affect the organizational performance of technology-driven SMEs in western China. By focusing on this specific regional and industrial context, the research aims to uncover nuanced insights into how sustainability initiatives can enhance competitiveness and resilience among smaller, innovation-driven firms.

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The following objectives guide the study:
Economic sustainability: To evaluate the extent to which financial stability, cost-effectiveness, and growth-oriented strategies contribute to improved performance outcomes in technology-based SMEs.
Social sustainability: To investigate how practices aimed at employee well-being, community engagement, stakeholder trust, and corporate reputation influence organizational effectiveness.
Environmental sustainability: To analyze the role of eco-friendly initiatives and resource efficiency in enhancing operational performance, reducing risks, and supporting long-term viability.

In pursuing these objectives, the study aims to address an existing gap in sustainability research, which often focuses on large corporations or coastal regions of China, with inland SMEs receiving comparatively less scholarly attention. By applying Dynamic Capability Theory as the guiding framework, this research not only contributes to the theoretical development of sustainability studies in emerging markets but also provides actionable insights for managers, policymakers, and other stakeholders seeking to foster sustainable growth in the SME sector.

2.0 Literature Review

2.1 Current Development
Sustainable development has become a central concern for SMEs, particularly in rapidly industrializing regions. While earlier research emphasized large corporations, more recent studies highlight that SMEs also integrate sustainability into their growth strategies. A recent meta-analysis reveals that social and environmental sustainability have a positive impact on SME competitiveness, with ecological sustainability exerting a more substantial effect, particularly on non-financial outcomes (Jamil et al., 2024).In a similar vein, Oduro et al. (2025) highlight that the advantages of sustainability initiatives typically surpass their costs, enabling SMEs to maintain long-term competitiveness, even in environments with limited resources.

2.2 Theory Related to Study
This research is grounded in Dynamic Capability Theory, which highlights an organization's ability to reconfigure, build, and align internal and external resources in response to environmental changes (Teece, 2018). Recent evidence provided by Taghizadeh et al. (2023) further demonstrates that such dynamic capabilities are essential for fostering sustainable innovation within SMEs, particularly in turbulent environments, highlighting their significance in such volatile settings. Correggi (2024) further develops the concept of "sustainable dynamic capabilities," illustrating how sustainability factors are increasingly integrated into capability frameworks in modern management studies. These contributions provide a robust theoretical foundation for examining the impact of sustainability on SME performance.

2.3 Organizational Performance (OP)
Organizational performance is a multidimensional construct encompassing financial results, operational efficiency, market position, and innovation. For SMEs, indicators often include profitability, growth rate, customer loyalty, and innovation output. Kraus et al. (2022) emphasize that sustainability-oriented SMEs are more likely to demonstrate superior performance in terms of innovation and stakeholder trust, which in turn translates into improved competitiveness. Recent research indicates that digital capabilities and green innovation practices also serve as key drivers in improving SME performance, broadening the conventional understanding of organizational success (Al-Husain et al., 2025).

2.4 Sustainable Development
Sustainability in SMEs is commonly categorized into three dimensions: economic, social, and environmental. Economic sustainability relates to efficiency and profitability; social sustainability focuses on employee welfare and community engagement; and ecological sustainability emphasizes energy conservation, waste reduction, and regulatory compliance. Kannan & Gambetta (2025) identify seven themes—such as sustainability orientation, innovation focus, and knowledge management—that characterize how technology-driven SMEs embed sustainability practices in their strategies. Durrani et al. (2024) highlight barriers, including financial constraints, limited awareness, and weak institutional support, which are especially relevant for SMEs in developing regions, such as inland China.

2.4.1 Economic Sustainability (ECS)
The economic aspect of sustainable development encompasses strategies and actions aimed at promoting an organization's financial resilience and growth, while also delivering sustained economic value to its stakeholders over the long term. This includes efficient resource utilization, cost reduction, and innovation-driven growth (Porter & Kramer, 2019). Research has shown that the economic dimension of sustainable development is directly linked to enhanced organizational performance. Zhang et al. (2022) found that SMEs that prioritize economic sustainability are more likely to experience growth in revenue and market share. These firms also tend to have better financial management practices, which contribute to their overall resilience in volatile markets (Gao et al., 2024).

2.4.2 Social Sustainability (SS)
The social aspect focuses on the company's obligations to society, such as ensuring fair labor practices, engaging with local communities, and promoting social equity. This aspect underscores the importance of fostering stakeholder trust and maintaining a strong, reputable

organizational image (Carroll & Shabana, 2020). Research has emphasized the critical role of the social dimension in fostering organizational legitimacy and improving employee well-being (Gao, 2022). Wang and Chen (2021) observed that SMEs with strong social sustainability practices tend to have lower turnover rates and higher employee morale, which directly impact productivity and, consequently, organizational performance.

2.4.3 Environmental Sustainability (ENS)

The environmental dimension focuses on mitigating an organization's ecological footprint by implementing practices. It is crucial for fostering long-term environmental responsibility and ensuring compliance with regulatory requirements (Hart, 2020). Research has demonstrated that ecological sustainability has a significant impact on organizational outcomes. For instance, Liu et al. (2021) reported that enterprises engaging in wide-ranging eco-friendly practices not only reduce their operational costs but also improve their market competitiveness by appealing to environmentally conscious consumers.

2.5 Relationships between Variables

Previous studies have shown that integrating sustainability practices positively influences organizational performance. Economic sustainability enhances resource utilization and cost efficiency, while social sustainability fosters trust and employee engagement. Environmental sustainability, in turn, reduces costs and improves reputation.

Meta-analytic evidence confirms that environmental sustainability often has the strongest effect on SME performance, while social sustainability fosters cohesion and legitimacy (Jamil et al., 2024). Al-Husain et al. (2025) further suggest that digital dynamic capabilities can strengthen the link between sustainability and performance through mediating factors such as green knowledge management and technological innovation. Together, these findings underscore the complex but positive relationships between sustainability dimensions and organizational outcomes.

2.6 Hypotheses Development

Embedding economic, social, and environmental considerations into core operational strategies is now widely regarded as a crucial approach for enterprises seeking sustainable growth and enduring competitiveness.

2.6.1 Economic Sustainability and Organizational Performance

The economic dimension of sustainable development focuses on strategies that enhance financial performance, including cost efficiency, resource optimization, and innovation-driven growth. Tech-driven SMEs that prioritize economic sustainability often experience enhanced profitability and increased market share, as these practices promote operational efficiency and the development of innovative solutions that meet market demands (Zhang & Wang, 2022).

Hypothesis 1: Economic sustainability positively impacts the organizational performance of tech-based SMEs.

2.6.2 Social Sustainability and Organizational Performance

The social dimension includes fair labor practices, community engagement, and social equity. By fostering a positive relationship with employees, customers, and the community, tech-based SMEs can enhance their reputation and build strong stakeholder relationships. These connections are essential for maintaining workforce commitment, building strong customer relationships, and strengthening the organization's reputation—all of which contribute significantly to improving performance outcomes (Carroll & Shabana, 2020).

Hypothesis 2: Social sustainability contributes positively to the performance of technology-oriented SMEs.

2.6.3 Environmental Sustainability and Organizational Performance

The environmental dimension entails minimizing an organization's impact on the environment by adopting practices like improving energy efficiency. Tech-based SMEs that proactively implement environmental sustainability measures are more likely to lower operational costs and enhance compliance with environmental regulations, both of which can contribute to stronger organizational performance.

Hypothesis 3: Environmental sustainability positively impacts the organizational performance of tech-based SMEs.

2.7 Research Gap

There is limited attention has been directed toward understanding how this relationship unfolds within technology-oriented SMEs operating in the Sichuan–Chongqing economic region. Most existing studies tend to neglect the holistic perspective required for smaller, innovation-driven enterprises.

2.8 Research Framework

This study constructs its conceptual framework based on Dynamic Capability Theory, which argues that adopting sustainable development strengthens the organization's flexibility in responding to change, drive innovation, and maintain a competitive advantage in evolving environments. In this conceptual model, sustainable development is defined across three key dimensions—economic, social, and environmental—that are treated as independent predictors. The outcome variable in this structure is organizational performance. The hypothesized relationships among these constructs will be empirically tested using Structural Equation Modeling (SEM), offering insights into how sustainable practices influence performance in tech-based SMEs located in the Sichuan and Chongqing economic circle. As displayed in Figure 1, the study's conceptual model outlines the hypothesized relationships.

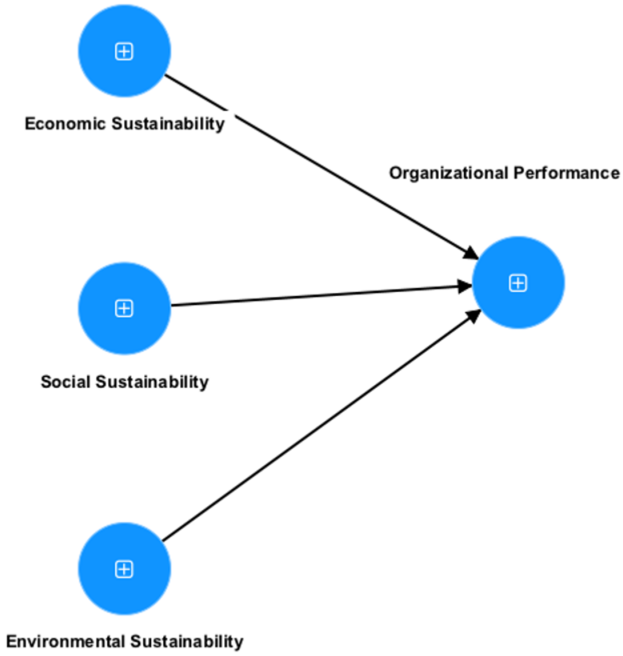

Fig 1: Research Framework

3.0 Methodology

3.1 Population and Unit of Analysis

As defined by the Evaluation Measures for Tech-Based Small and Medium-Sized Enterprises issued by China's Ministry of Industry and Information Technology, tech-based SMEs refer to enterprises that employ scientific and technical experts to carry out R&D efforts, obtain proprietary intellectual property, and transform these innovations into advanced products or services. These firms emphasize scientific exploration and the application of their outcomes, playing a leading role in driving technological advancement and facilitating industrial transformation. The classification of such enterprises is based on criteria including workforce size, annual revenue, and total assets.

This study adopts the individual SME as the unit of analysis, with data collected at the organizational level. The focus is placed on senior decision-makers—such as business owners, managers, and executives—who possess in-depth knowledge of their company's sustainability strategies and performance indicators. This approach aligns with established practices in SME-related sustainability research, where the top management team is considered the most suitable informant due to their holistic view of both strategic orientation and operational outcomes (Kraus et al., 2022; Chen et al., 2021).

3.2 Sampling and Sampling Technique

To ensure adequate representation across the varied sectors of the SME population in the Sichuan and Chongqing economic circle, this study adopts a stratified random sampling approach. Stratification is carried out based on industry categories, including manufacturing, services, and technology, to account for sector-specific variations in sustainability practices and organizational performance. Stratified sampling is justified here because it enables proportional representation across heterogeneous subgroups, which improves the generalizability and comparability of the findings across sectors (Kline, 2016).

A target sample size of 200 SMEs was determined in accordance with SEM recommendations, which suggest at least 10 observations per estimated parameter (Kline, 2016). Ultimately, 371 valid responses were obtained, exceeding the minimum requirement and thereby enhancing the statistical power of the analysis. This sample size also accommodates the potential for non-response bias and measurement error, which are common challenges in organizational surveys (Hair et al., 2021). Respondents were selected from publicly accessible enterprise directories, government-approved SME registries, and local science & technology parks to ensure representativeness. Each potential respondent received a formal invitation via email or telephone. Only SMEs that met the official classification criteria and confirmed their technology-based orientation were included in the final sampling frame.

3.3 Measurement and Instrumentation

The constructs of sustainable development—encompassing economic, social, and environmental dimensions—as well as organizational performance are assessed through established measurement instruments derived from prior studies, with modifications made to align with the unique characteristics of SMEs in the Sichuan–Chongqing economic region. Each dimension is defined and measured as follows: Economic Sustainability includes metrics such as cost-effectiveness, financial outcomes, and resource utilization efficiency (Porter & Kramer, 2019). Social Sustainability is evaluated through indicators covering employee well-being, community involvement, and corporate social responsibility initiatives (Carroll & Shabana, 2020). Environmental Sustainability is captured through measures such as energy conservation, waste reduction, and adherence to environmental regulations (Liu et al., 2021). Organizational Performance is assessed using a comprehensive framework that encompasses financial success, competitive positioning, operational productivity, and innovation capacity (Kraus et al., 2022). The study employs a Likert scale comprising five levels, ranging from complete disagreement to complete agreement, to gather participants' assessments of their firms' sustainability practices and organizational outcomes. Before the full-scale deployment, the questionnaire underwent pre-testing and pilot testing to verify its validity, clarity, and reliability. The results of Cronbach's alpha and factor analysis from the pilot phase showed acceptable internal consistency ($\alpha > 0.70$) for all constructs, affirming the psychometric strength of the instrument (Hair et al., 2017).

3.4 Data Collection Procedures

The research relied on an online questionnaire with a fixed structure to collect responses, distributed via email to SMEs within the Sichuan and Chongqing economic zone. Follow-up reminders are sent to encourage higher participation. The data collection period lasts for three months (from June to August 2024), allowing for any potential delays and ensuring a robust response rate. To enhance respondent engagement, participants are assured of the confidentiality and anonymity of their responses. Before participating, individuals are provided with an informed consent form that clearly states they can withdraw at any point without experiencing negative consequences. The procedures for anonymity and voluntary participation align with the ethical standards approved by the authors' institutional ethics committee.

3.5 Data Analysis Technique

The analytical procedures in this research are carried out with SmartPLS 4.0, a recognized platform for implementing Partial Least Squares SEM. This tool proves especially useful in research designs that incorporate multiple latent constructs and numerous measurement indicators, as it offers flexibility in estimating complex causal relationships. The decision to employ SmartPLS is further supported by its intuitive interface, robust bootstrapping options, and capacity to manage models that may not meet the stringent assumptions required by covariance-based SEM techniques.

PLS-SEM is especially well-suited to the objectives of the present research. Unlike traditional SEM methods that emphasize overall model fit, PLS-SEM prioritizes prediction and variance explanation, making it an effective choice when the goal is to uncover how different dimensions of sustainable development interact to shape organizational performance. This approach is particularly valuable in exploratory studies, where theoretical frameworks are still evolving, and researchers seek to generate practical insights alongside statistical rigor.

Another important reason for adopting PLS-SEM lies in its suitability for studies with moderate or relatively small sample sizes, where maximum likelihood estimation methods may struggle to yield reliable results. By focusing on variance-based estimation, PLS-SEM provides more stable parameter estimates under such conditions (Hair et al., 2021). Thus, the use of SmartPLS 4.0 not only ensures methodological rigor but also enhances the credibility of findings by accommodating the specific data characteristics and research aims of this study.

3.5.1 Measurement Model Evaluation

To safeguard the robustness and consistency of the measurement model, several reliability and validity assessments will be conducted. First, indicator reliability will be examined by considering the outer loadings of each observed variable. High loadings demonstrate that the individual indicators strongly contribute to the construct they are intended to represent. As a general guideline, values at or above the 0.70 benchmark are considered adequate, reflecting that the indicator shares a substantial amount of variance with its associated construct (Hair et al., 2017).

The coherence among items for each construct will also be tested by calculating Composite Reliability (CR), extending the evaluation beyond individual indicators. Whereas Cronbach's Alpha treats all items equally, Composite Reliability weights them by their loadings, producing a more accurate indicator of consistency within constructs. A CR value exceeding 0.70 suggests that the items grouped under the same construct share a sufficiently high degree of consistency.

Convergent validity will subsequently be examined through the Average Variance Extracted (AVE), which serves as a key indicator of how well a construct accounts for the variance in its observed measures relative to the amount of variance attributable to measurement error. In essence, AVE evaluates the degree to which indicators of a specific latent variable converge or share a high proportion of common variance. A commonly accepted benchmark is an AVE value above 0.50, which suggests that the construct is able to explain more than half of the variance in its associated indicators. Meeting this threshold provides empirical support for the adequacy of the measurement model, as it demonstrates that the construct is sufficiently represented by its items and that random error does not dominate the measurement process.

Finally, discriminant validity will be assessed by applying both the Fornell–Larcker criterion and the Heterotrait–Monotrait ratio (HTMT). The Fornell–Larcker approach evaluates whether each construct is sufficiently distinct by comparing the square root of its Average Variance Extracted (AVE) with the correlations it shares with other constructs. In practice, discriminant validity is confirmed when the square root of a construct's AVE exceeds the correlation coefficients between that construct and any other latent variable, indicating that the construct explains its own indicators better than it overlaps with related constructs. The HTMT ratio provides a more stringent test by estimating construct distinctiveness through inter-construct correlations. Employing both methods offers complementary evidence that the constructs are conceptually unique and not excessively overlapping (Gao, 2024).

Taken together, these tests—covering reliability at the indicator and construct levels as well as convergent and discriminant validity—enable a rigorous validation of the measurement model and confirm the credibility of the latent variables utilized.

3.5.2 Structural Model Evaluation

The structural model is examined through the verification of hypothesized construct relationships and the assessment of its capacity to account for variance and predict outcomes. Path coefficients will be estimated to indicate both the magnitude and the direction of the causal relationships. These coefficients reveal how strongly one construct contributes to or influences another, thus providing direct evidence regarding the validity of the proposed research hypotheses. A nonparametric bootstrapping approach with 5,000 iterations will be employed in SmartPLS 4.0 to evaluate the significance of the structural paths, providing robust estimates of standard errors and confidence intervals.

In addition to the path analysis, the model's explanatory capacity will be evaluated using the Coefficient of Determination (R^2). The statistic reflects the extent to which organizational performance, as the endogenous variable, is explained by the exogenous dimensions of sustainability: economic, social, and environmental. Higher R^2 values suggest a stronger explanatory power of the model and thus greater confidence in the relevance of the proposed predictors.

To complement the explanatory assessment, predictive relevance will be examined by calculating the Stone–Geisser Q^2 statistic through a blindfolding procedure. A positive Q^2 value signals that the model offers predictive capability, indicating its ability to anticipate outcomes for the endogenous variable beyond mere replication of observed data. This step is essential for ensuring that the model not only explains relationships within the current dataset but also holds predictive utility beyond it.

Together, the combined evaluation of path significance, R^2 values, and Q^2 statistics offers a rigorous framework for testing the structural model. By adopting this comprehensive approach, the study aims to provide robust empirical evidence regarding the extent to which different dimensions of sustainability contribute to enhancing organizational performance among technology-based SMEs in the Sichuan–Chongqing economic region.

3.6 Ethical Considerations

This research strictly complies with the ethical standards set forth by the affiliated academic institution and relevant oversight bodies. Key ethical measures include protecting participant anonymity and confidentiality, securing voluntary informed consent, and clearly communicating that participants may withdraw at any point without negative consequences. All collected information is stored in a secure manner and is accessible exclusively to the research team. Furthermore, any potential conflicts of interest are openly disclosed, and the study is conducted with transparency and academic integrity to guarantee the reliability, objectivity, and fairness of the reported results.

4.0 Findings

4.1Measurement model results

In PLS-SEM, the process begins with an evaluation of the measurement model and it involves a systematic assessment of four major criteria: indicator reliability, internal consistency, convergent validity, and discriminant validity. These checks collectively ensure that the observed variables provide an accurate and reliable representation of the theoretical constructs being studied.

As summarized in Table 1 and illustrated in Figure 2, the outer loadings of the indicators fall within the range of 0.724 to 0.819. The fact that all loadings are greater than the 0.70 threshold (Hair et al., 2021) offers strong support for the adequacy of the indicators in representing their constructs. In other words, the items demonstrate sufficient individual reliability and validity in capturing the construct they are intended to measure.

For a more comprehensive reliability check, Cronbach's alpha and Composite Reliability (CR) were employed to evaluate the constructs. The classical approach of Cronbach's alpha evaluates reliability by treating all items as having identical loadings, CR offers a more refined estimate because it incorporates the actual loading values of each indicator. Values above 0.70 for both measures are generally regarded as acceptable, suggesting that the items within each construct are homogeneous and measure the same underlying dimension consistently.

The results reported in Table 1 and visually depicted in Figures 2 and 3 confirm that these reliability standards are met. Together, these findings demonstrate that the constructs exhibit strong internal consistency and that the measurement model is adequately specified, laying a solid foundation for subsequent analysis of convergent and discriminant validity.

Table 1. Construct validity and reliability

Items	Factor Loadings	Alpha	CR rho-c	AVE
ECS1	0.775	0.786	0.861	0.609
ECS2	0.800			
ECS3	0.766			
ECS4	0.779			
SS1	0.756	0.840	0.887	0.610
SS2	0.802			
SS3	0.802			
SS4	0.819			
SS5	0.724			
ENS1	0.746	0.785	0.861	0.608
ENS2	0.800			
ENS3	0.785			
ENS4	0.787			
OP1	0.786	0.843	0.888	0.613
OP2	0.818			
OP3	0.791			
OP4	0.772			
OP5	0.746			

Note (s): Alpha = Cronbach's Alpha, CR = Composite reliability, AVE = Average variance extracted. 2 Source: Authors' calculation.

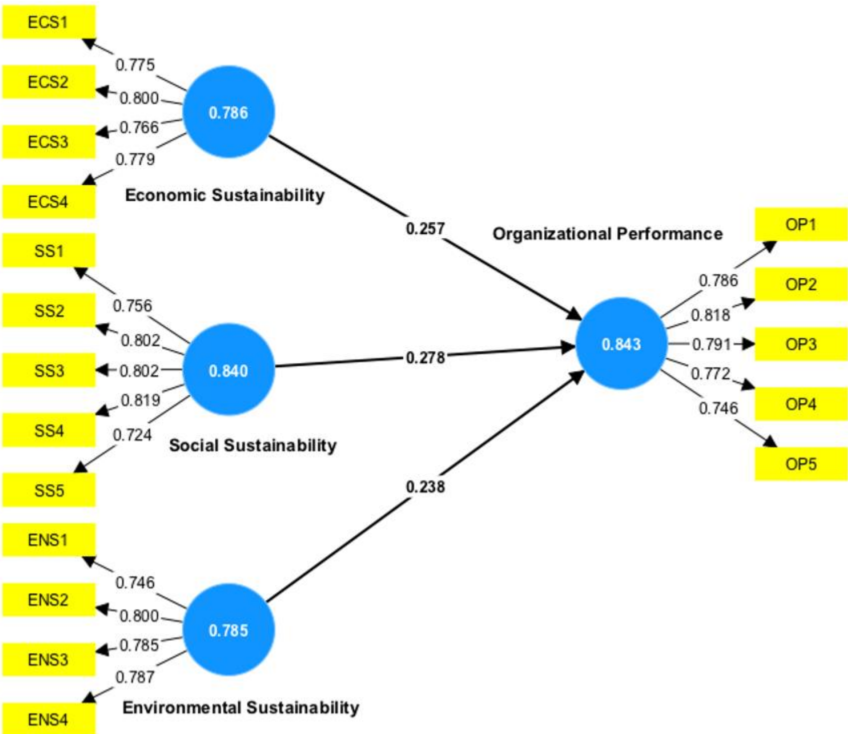

Fig. 2 Factor Loadings and Cronbach's alpha

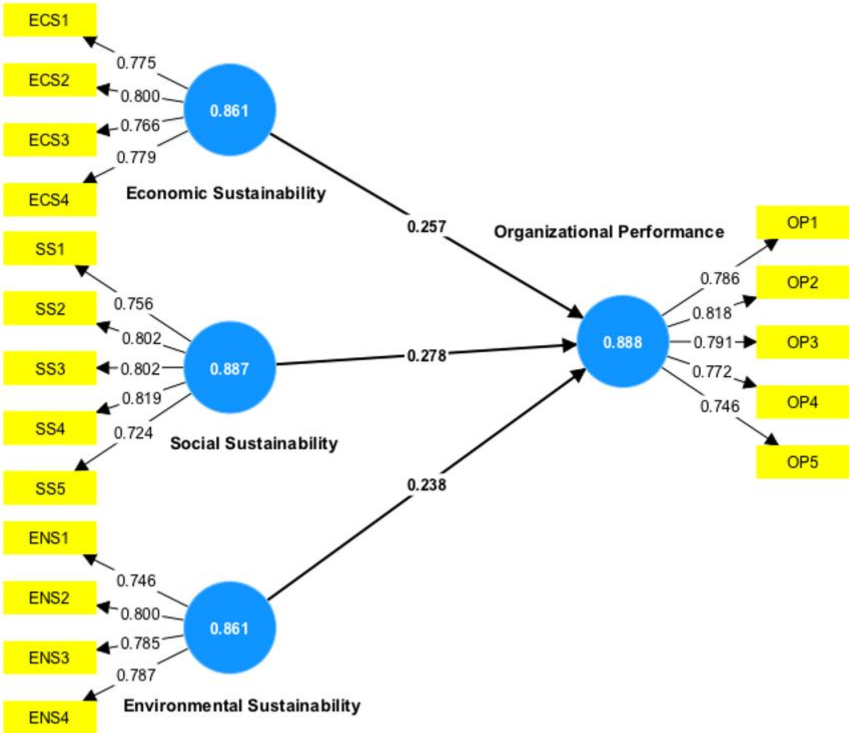

Fig. 3 Factor Loadings and Composite Reliability

Secondly, convergent validity assesses how well multiple indicators measure the same underlying construct. As presented in Table 2 and Figure 4, the AVE values range from 0.608 to 0.613, surpassing the 0.50 threshold based on the benchmark set by Hair et al. (2021), indicating sufficient convergent validity among the constructs. Additionally, discriminant validity examines whether conceptually distinct constructs are empirically separable. Hair et al. (2021) emphasize the importance of ensuring that indicators assigned to different constructs are not overly correlated. To address the limitations of traditional methods, the HTMT ratio, put forward by Henseler et al. (2016), is regarded as a superior alternative for evaluating discriminant validity. They recommend a threshold of 0.85 for constructs that are conceptually distinct. According to Table 2, the HTMT ratios do not exceed the threshold, providing evidence that discriminant validity is sufficiently met within the model.

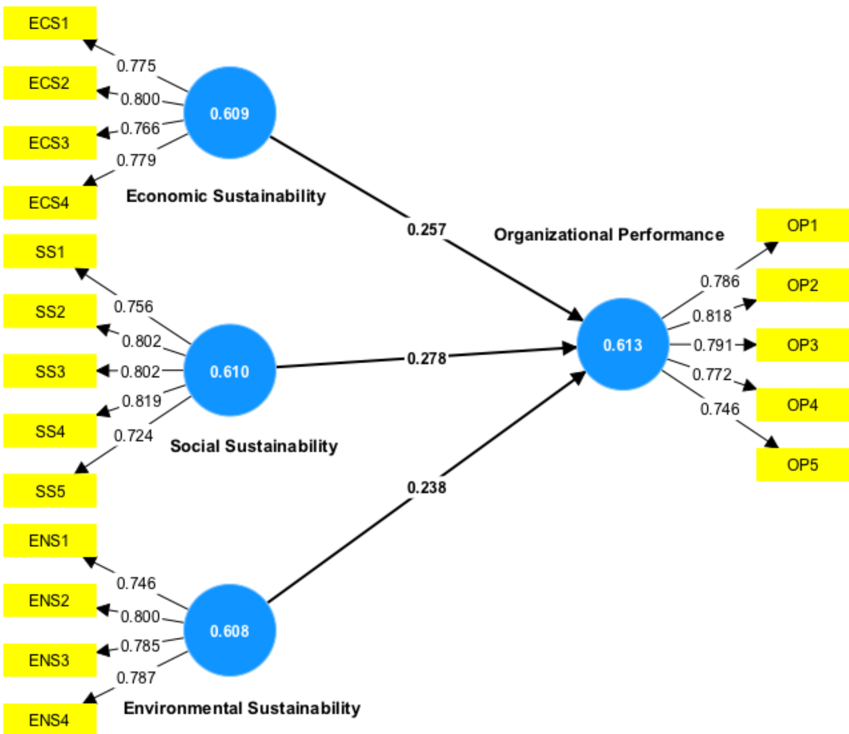

Fig. 4 Factor Loadings and AVE

Table 2. HTMT criterion

	ECS	ENS	OP	SS
ECS				
ENS	0.495			
OP	0.579	0.634		
SS	0.577	0.820	0.654	

4.2 Structural Model Results

After confirming the adequacy of the measurement model, SmartPLS 4.0 was employed to assess the structural model through bootstrapping, based on 5,000 resamples for stable parameter estimation. This analysis aims to test the proposed hypotheses by evaluating the inner model, which provides t-statistics and p-values for each structural path. Statistical significance is established when the p-value is less than 0.05 or the t-value surpasses the critical value of 1.96. The outcomes of the structural analysis, including the evaluation of each hypothesis, are detailed in Table 3 and graphically represented in Figure 4.

Table 3. Hypotheses testing results.

Hypotheses	Structural Path	Coefficient	T-statistics	Test result
H1	ECS → OP	0.257***	4.993	Supported
H2	SS → OP	0.238***	3.882	Supported
H3	ENS → OP	0.278***	4.522	Supported

Notes: *p <0.05, **p <0.01, ***p <0.001 (two-tailed test). 2 Source: Authors' calculation

Table 4 presents the results for predictive validity, illustrating how effectively the independent variables account for variations in the dependent constructs. To assess the model's predictive strength, two key metrics—R^2 and Q^2—were employed. Hair et al. (2021) recommend that an R^2 value above 0.26 indicates a meaningful level of explanatory power. In this study, the structural model accounted for 40.1% of the variance in organizational performance (OP), demonstrating a strong level of predictive accuracy. A Q^2 value greater than zero was obtained, indicating that the model possesses meaningful predictive relevance for the endogenous variables and can generate reliable forecasts.

Table 4. Predictive relevance of the model

	R Square	Q2 (= 1-SSE/SSO)
OP	0.401	0.385

4.3 Findings

Empirical outcomes from the analysis confirm that sustainability practices exert a beneficial effect on the organizational performance of technology-based SMEs within the Sichuan–Chongqing zone. Using Smart-PLS-SEM 4.0, the analysis validated several key hypotheses. The analysis first revealed that economic sustainability has a significantly positive impact on SME performance, thereby confirming hypothesis H1. Economic sustainability was shown to positively influence the performance of SMEs (H1). This finding aligns with previous studies, which demonstrate that organizations prioritizing economic sustainability—through measures such as cost reduction and efficient resource utilization—tend to achieve better financial performance and heightened competitive advantage (Zhang & Wang, 2022). Additionally, the study validated that social sustainability positively influences organizational performance (H2), underscoring the importance of corporate social responsibility in boosting employee engagement, fostering positive community relations, and enhancing customer loyalty—all of which collectively contribute to improved business outcomes (Carroll & Shabana, 2020).Lastly, environmental sustainability was shown to positively affect SME performance (H3), reinforcing earlier findings that eco-friendly practices—like minimizing waste and increasing energy efficiency—not only reduce operational costs but also enhance regulatory compliance and strengthen corporate reputation (Liu et al., 2021).

5.0 Discussion

This study demonstrates that economic, social, and environmental sustainability each have a positive effect on the organizational performance of technology-oriented SMEs located in the Sichuan–Chongqing economic zone. Economic sustainability enhances financial performance through efficient resource use and innovation. Social sustainability contributes to stronger employee involvement and more robust stakeholder relationships, promoting organizational cohesion and building trust. Notably, environmental sustainability emerged as the most influential factor, suggesting that environmentally responsible practices not only lead to cost savings but also bolster corporate reputation and ensure alignment with regulatory standards.

These results align with the core principles of Dynamic Capability Theory, which highlights a firm's capacity to sense opportunities, seize them, and reconfigure resources in response to dynamic and evolving environments (Teece, 2018).In the case of tech-based SMEs in inland China, the positive impacts of all three sustainability dimensions suggest that such firms are not merely adopting static CSR policies but are dynamically integrating sustainable practices as part of their adaptive capabilities. This supports the view that sustainability is not peripheral but foundational to innovation, operational agility, and long-term value creation—key constructs in the dynamic capability framework.

From a problem- and issue-based perspective, the study addresses the under-researched challenge of how resource-limited SMEs in non-coastal regions can remain competitive in the face of environmental regulation, market volatility, and rising social expectations. While most literature focuses on well-capitalized firms or developed economies, this research demonstrates that even under significant constraints, tech-based SMEs can strategically leverage sustainability to offset their limitations. Specifically, environmental sustainability's stronger-than-expected impact may reflect shifting institutional pressures, such as China's "dual-carbon" policy, which forces even smaller firms to innovate in green processes or risk marginalization.

Moreover, this study contributes to ongoing academic discourse regarding the integration of sustainability into SME strategy, offering evidence that goes beyond the normative “why” and begins to explain “how” sustainability practices function as embedded capabilities. This supports calls in the literature (e.g., Porter & Kramer, 2019; Carroll & Shabana, 2020) for a rethinking of sustainability not as compliance or philanthropy, but as a driver of strategic renewal and competitive repositioning in turbulent contexts.

6.0 Conclusions

This study explores the impact of sustainable development—specifically its economic, social, and environmental dimensions—on the organizational performance of technology-based SMEs operating within the Sichuan–Chongqing economic region. Based on data from 371 valid samples and analysis via Smart PLS-SEM, the findings provide robust empirical evidence that all three sustainability dimensions significantly and positively influence firm performance. Environmental sustainability showed the strongest impact, suggesting that eco-friendly practices are increasingly becoming a core driver of competitiveness. Economic sustainability improves efficiency and profitability, while social sustainability strengthens internal cohesion and external relationships. These results reinforce the value of Dynamic Capability Theory in explaining how SMEs adapt and thrive through sustainability practices.

While this study generates meaningful contributions to understanding the link between sustainability and organizational outcomes, certain limitations should be acknowledged to provide a balanced interpretation of the findings. First, the data were collected exclusively from technology-oriented small and medium-sized enterprises (SMEs) operating within the Sichuan–Chongqing economic circle. Although this regional focus offers a clear contextual perspective, it inevitably narrows the generalizability of the conclusions. Enterprises in other geographic settings or industries with different institutional, cultural, or economic conditions may not exhibit the same patterns observed here.

Second, the research design is cross-sectional, meaning that data were gathered at a single point in time. This design restricts the ability to establish temporal ordering and long-term causality between sustainability practices and firm performance. As a result, while associations can be identified, the study cannot fully capture how sustainability initiatives may influence performance outcomes in a dynamic or evolving manner over time. Future longitudinal studies could address this shortcoming by tracking firms across multiple years.

Third, the analysis relies primarily on self-reported measures provided by managerial respondents. Although managers are likely to have deep knowledge of their organizations, such data may be affected by social desirability bias or subjective interpretation. Respondents may overstate the extent of sustainable practices or their perceived benefits in order to present their firms in a more favorable light. This reliance on perceptual data introduces potential measurement error and limits the objectivity of the results. Complementing survey data with secondary sources or objective performance metrics could mitigate this concern.

Taken together, these limitations highlight the contextual and methodological boundaries of the study, while also suggesting avenues for further research to strengthen the robustness and external validity of future investigations.

To enhance the robustness of future studies, several improvements are recommended. Employing a longitudinal research design could provide deeper insights into how sustainability initiatives evolve over time and influence performance trajectories. Additionally, incorporating objective performance metrics (e.g., audited financial data, sustainability ratings) alongside perceptual indicators could reduce bias and strengthen the reliability of the results. Expanding the sample to include SMEs from other regions or industries would also improve external validity and allow for meaningful comparisons across sectors.

Future research may explore several promising directions. One avenue is to investigate the moderating or mediating roles of variables such as digital capability, leadership style, or firm age in the sustainability–performance relationship. Another is to examine how government policy support, green innovation capacity, or market orientation shape the implementation and impact of sustainability strategies in SMEs. Comparative studies across developed and developing economies, or between urban and rural firms, could also enrich our understanding of contextual influences on sustainable development practices.

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Paper Contribution to Related Field of Study

This study broadens the scope of Dynamic Capability Theory by applying it to the context of resource-limited, innovation-driven SME technology enterprises. The study offers a nuanced understanding of how SMEs can integrate multiple dimensions of sustainability into strategic management. The findings provide theoretical enrichment and actionable insights or scholars, policymakers, and practitioners focused on sustainable regional development, SME strategy, and innovation in emerging economies.

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