The Journal of Asia Entrepreneurship and Sustainability RESEARCH ARTICLE

Sustainable Marketing Strategies and Their Impact on Entrepreneurial Growth in Emerging Asian Economies

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Abstract
The study investigated the relationship between sustainability indicators and entrepreneurial activity across four emerging Asian economies India, Indonesia, Malaysia, and the Philippines using the latest available secondary data from global institutions. The research examined how environmental performance, innovation output, renewable energy consumption, economic development, human capital, and institutional quality influenced new business density. A cross-sectional quantitative design was employed, integrating data from the Environmental Performance Index, Global Innovation Index, World Bank, and United Nations Development Programme. Descriptive statistics, correlation analysis, and simple regressions were used to explore associations among variables. Findings revealed that environmental performance, GDP per capita, and ease of doing business were positively associated with entrepreneurial activity, indicating that stronger sustainability governance and institutional support fostered higher business formation. Renewable energy consumption showed a negative relationship with entrepreneurship, suggesting transitional or structural energy factors unique to these economies. Innovation output demonstrated limited direct influence, implying that national innovation capacities may take longer to translate into entrepreneurial growth. Human capital also played a meaningful role, aligning with established theoretical perspectives. Although the small sample size limited generalizability, the study provided valuable exploratory insights into sustainability entrepreneurship linkages in emerging Asian contexts. The results emphasized the need for integrated policy approaches that advance environmental priorities while enabling entrepreneurial development.

Keywords: Sustainable entrepreneurship, Environmental performance, Innovation, Emerging Asian economies, New business density.

1. Introduction

Sustainable marketing has become an essential strategic approach for firms aiming to remain competitive while addressing environmental and social challenges. In emerging Asian economies, the integration of sustainability into business practices has gained increasing importance as governments and industries shift toward greener development pathways. Entrepreneurship, a critical driver of economic growth and innovation, is significantly influenced by the broader sustainability landscape. Indicators such as environmental performance, energy transition, human capital, and institutional quality shape the conditions under which new ventures emerge. Understanding how sustainability-related factors support or constrain entrepreneurial activity offers valuable insights for policymakers and businesses seeking long-term, responsible growth. Sustainable entrepreneurship has gained increasing attention as countries work toward balancing economic growth with environmental and social priorities. In emerging Asian economies, entrepreneurship plays a vital role in supporting inclusive development, job creation, and innovation-led competitiveness (Asian Development Bank, 2024). Research suggests that innovation ecosystems provide critical support for sustainable venture creation when well-coordinated and supported by institutional actors (Bakry et al., 2024). Strategic entrepreneurship further strengthens business performance, particularly in dynamic and resource-constrained environments such as India (Bashir et al., 2025). Broader industrial and policy frameworks also shape entrepreneurial pathways, as highlighted in OECD-aligned studies exploring evolving policy perspectives (Criscuolo et al., 2022). Business model innovation is another factor influencing sustainability-driven ventures, with leadership traits shown to moderate innovation outcomes (Ding, 2024). Entrepreneurship has also been linked to poverty reduction and opportunity expansion in both developed and emerging regions (Douaihy et al., 2024). Institutional quality, including ease of business operations, remains a crucial determinant of entrepreneurial entry (World Bank, 2020).Sustainability frameworks such as the SDGs continue to guide businesses and policymakers, encouraging corporate responsibility and

environmental stewardship (Fallah Shayan et al., 2022). Economic factors, including GDP per capita, influence entrepreneurial activity by shaping market opportunities and resource availability (World Bank, 2023). Entrepreneurship dynamics also evolve with global shocks, as highlighted in the GEM global report discussing new norms and resilience (Hill et al., 2023).

Open innovation and sustainable business models further encourage collaborative entrepreneurial practices (Huang and Zhou, 2025). Renewable energy transitions, supported by organizations such as International Renewable Energy Agency (IRENA) contribute to long-term competitiveness but may influence entrepreneurial outcomes differently across countries. CSR practices also align environmental responsibility with corporate sustainability performance, especially in emerging economies such as India and China (Lartey et al., 2022). Moreover, sustainability-oriented entrepreneurial ecosystems significantly shape institutional quality and influence entrepreneurial behavior (Audretsch et al., 2024). In addition,Green dynamic capabilities and green innovation play a crucial role in enhancing sustainable business performance, reinforcing the strategic importance of environmental responsibility within entrepreneurial ecosystems (Mubeen et al., 2024).

Human capital, measured through indicators such as mean years of schooling, remains a foundational pillar influencing innovative capacity and entrepreneurship (United Nations Development Programme, 2023). Spillover mechanisms from multinational enterprises accelerate ecosystem development, improving entrepreneurial opportunities (Rizvi et al., 2025). Finally, educational frameworks play a key role in enhancing sustainability-driven entrepreneurship when effectively structured (Schöggl, 2024). Collectively, existing research emphasizes the strong influence of environmental performance, innovation systems, institutional quality, human capital, and energy transitions on entrepreneurial outcomes in emerging economies. However, limited comparative empirical studies integrate these indicators at the national level, highlighting a clear gap addressed in the present research.Despite rapid economic expansion, many emerging Asian economies continue to face structural challenges that hinder sustainable entrepreneurial development. Existing research has largely examined sustainability and entrepreneurship separately, leaving limited empirical evidence on how specific sustainability indicators such as environmental performance, renewable energy use, innovation capacity, and institutional quality directly influence entrepreneurial activity. Furthermore, cross-country comparative studies using updated global datasets remain scarce. This gap restricts policymakers' ability to design integrated sustainability and entrepreneurship strategies. Therefore, this study investigates the relationships between sustainability metrics and new business formation across selected Asian economies to better understand the contextual factors shaping entrepreneurial growth.

Objectives of the study

1. To examine the influence of environmental performance, renewable energy consumption, and innovation output on entrepreneurial activity in emerging Asian economies
2. To assess the role of economic development, human capital, and institutional quality as control factors shaping new business formation
3. To provide comparative insights on how sustainability-related indicators collectively impact entrepreneurship across India, Indonesia, Malaysia, and the Philippines

2. Research Methodology

2.1 Research Design

This study employed a cross-sectional quantitative research design to examine how sustainability indicators and innovation performance influenced entrepreneurial activity across selected emerging Asian economies. The design relied exclusively on secondary datasets obtained from internationally recognized sources, ensuring reliability and comparability. Four countries India, Indonesia, Malaysia, and the Philippines were purposefully selected due to their economic diversity and relevance within Asia's entrepreneurial landscape. The analysis focused on identifying statistical associations between sustainability-related variables and new business density. The design was appropriate for describing patterns rather than establishing causality, and all analytical procedures reflected the most recent available data for each variable.

2.2 Data Sources

The study utilized secondary data extracted from authoritative global databases. Environmental sustainability was measured using the 2024 Environmental Performance Index (EPI), while innovation capability was captured through the 2024 Global Innovation Index (GII) innovation output score. Renewable energy consumption and GDP per capita were retrieved from the World Bank's World Development Indicators for 2021. Entrepreneurial activity was measured using the World Bank's new business density indicator for 2021. Human capital was represented by mean years of schooling from the 2023 UNDP Human Development Report. Ease of Doing Business scores for 2019 were sourced from the World Bank's DTF database.

2.3 Variable Selection

Variables were selected based on theoretical relevance and empirical precedence in sustainability

and entrepreneurship literature. The dependent variable was new business density, representing entrepreneurial activity. Independent variables included EPI 2024, GII innovation output 2024, and renewable energy consumption (2021) as sustainability and innovation indicators. Control variables were GDP per capita (PPP, 2021), mean years of schooling (2023), and ease of doing business (2019). These variables captured economic development, human capital, and institutional quality. All variables were numerical and directly comparable across countries, enabling standardized statistical analysis. Their selection reflected data availability and alignment with the research objectives.

2.4 Data Preparation and Cleaning

Data preparation involved extracting, organizing, and cleaning all selected indicators into a unified dataset. Non-numeric formatting, missing values, and inconsistent naming were corrected manually. Outdated or irrelevant indicators, such as historical EPI scores from earlier years, were removed to maintain methodological consistency. Variable units were standardized, country names were aligned, and dataset rows were verified against original sources. Descriptive statistics and correlation checks were conducted to ensure internal consistency. Because datasets originated from different years, each value was cross-validated to confirm it represented the most recent complete year available. The final dataset contained four comparable observations.

2.5 Analytical Techniques

The analysis employed descriptive statistics, correlation analysis, and simple linear regression. Descriptive statistics summarized central tendencies and variability across all indicators. Pearson correlation coefficients were computed to assess linear associations between sustainability, innovation, and entrepreneurial variables. Due to the small sample size (n=4), multiple regression was not appropriate therefore, separate bivariate regressions were estimated with new business density as the dependent variable. Each regression evaluated the direction and magnitude of relationships between entrepreneurial activity and selected predictors. All analyses were conducted using spreadsheet-based computational tools, ensuring transparency and replicability.

2.6 Ethical Considerations

This study relied solely on publicly available secondary data obtained from established international organizations. No primary data were collected from individuals, and no personal or sensitive information was used. Therefore, issues related to informed consent, confidentiality, or participant risk were not applicable. Proper citation and acknowledgment of the data sources ensured compliance with ethical standards regarding intellectual property and academic integrity. Data were used exclusively for academic research purposes, and all reporting adhered to responsible research practices. The study followed non-interventionist guidelines, ensuring that no social, environmental, or economic harm resulted from the research process.

3. Results

3.1 Descriptive Statistics

Descriptive statistics revealed substantial variation across countries in sustainability, innovation, and entrepreneurial indicators. New business density ranged from 0.1 in Indonesia to 2.1 in Malaysia, indicating differing levels of entrepreneurial activity. Environmental performance scores were highest in Malaysia and lowest in India. Renewable energy consumption was highest in India and lowest in Malaysia. GDP per capita values demonstrated clear economic disparities, with Malaysia leading significantly. Human capital, measured by mean years of schooling, showed moderate differences, while ease of doing business scores reflected institutional variation. Overall, descriptive findings highlighted distinct developmental profiles across the four emerging Asian economies. Table 1 provided a summary of the central tendencies and variability of all study variables across the four countries. The indicators showed substantial differences in sustainability, innovation, and entrepreneurial conditions among the selected economies. These descriptive patterns offered an initial understanding of structural contrasts shaping entrepreneurial outcomes.

TABLE 1: Descriptive Statistics of Study Variables

Variable	Mean	Std. Dev.	Min	Max
EPI 2024	33.58	5.57	27.6	41.0
GII Output 2024	29.58	7.77	19.9	38.8
Renewable Energy 2021	22.65	11.75	7.5	34.9
New Business Density 2021	0.65	0.97	0.10	2.10
GDP Per Capita PPP 2021	18,357	12,788	9,183	37,083
Mean Years of Schooling 2023	9.16	1.81	6.88	11.09
Ease of Doing Business 2019	69.48	8.54	60.9	81.3

3.2 Correlation Analysis

Correlation analysis indicated strong relationships among several variables. New business density demonstrated positive correlations with environmental performance, GDP per capita, institutional quality, and mean years of schooling, suggesting that economically advanced and better-governed countries tended to exhibit higher entrepreneurial activity. Renewable energy consumption showed a negative correlation with entrepreneurial density, influenced by Malaysia's low renewable share but high business formation. Innovation output displayed only a weak association with new business density. Given the small sample size, these correlations were treated as exploratory patterns rather than statistically conclusive evidence. Nonetheless, they offered preliminary insights into variable interrelationships. Table 2 shows the correlations among sustainability, innovation, economic, and entrepreneurial variables. Strong associations emerged between new business density, environmental performance, GDP per capita, and institutional quality, indicating interconnected developmental dynamics. These correlations provided preliminary insights into potential predictors of entrepreneurial activity prior to regression analysis.

TABLE 2: Correlation Matrix of Key Variables

Variable	EPI	GII	RE	NBD	GDP	Schooling	EDB
EPI	1						
GII	0.49	1					
RE	-0.97	0.11	1				
NBD	0.87	0.15	-0.84	1			
GDP	0.96	-0.10	-0.95	0.97	1		
Schooling	0.89	-0.35	-0.81	0.71	0.76	1	
EDB	0.79	0.09	-0.82	0.91	0.92	0.45	1

3.3 Regression Results: EPI and Entrepreneurship

The simple regression between EPI 2024 and new business density revealed a positive association. Higher environmental performance was associated with higher rates of new business registrations across the four countries. The model produced a relatively strong R^2 value, suggesting that environmental sustainability explained a substantial portion of variation in entrepreneurial activity. Although the results were statistically limited due to the small sample size, the pattern indicated that stronger environmental governance and sustainability practices may support favorable business environments. This finding aligned with emerging literature linking sustainability readiness to entrepreneurial opportunities in transitioning and innovation-oriented economies.

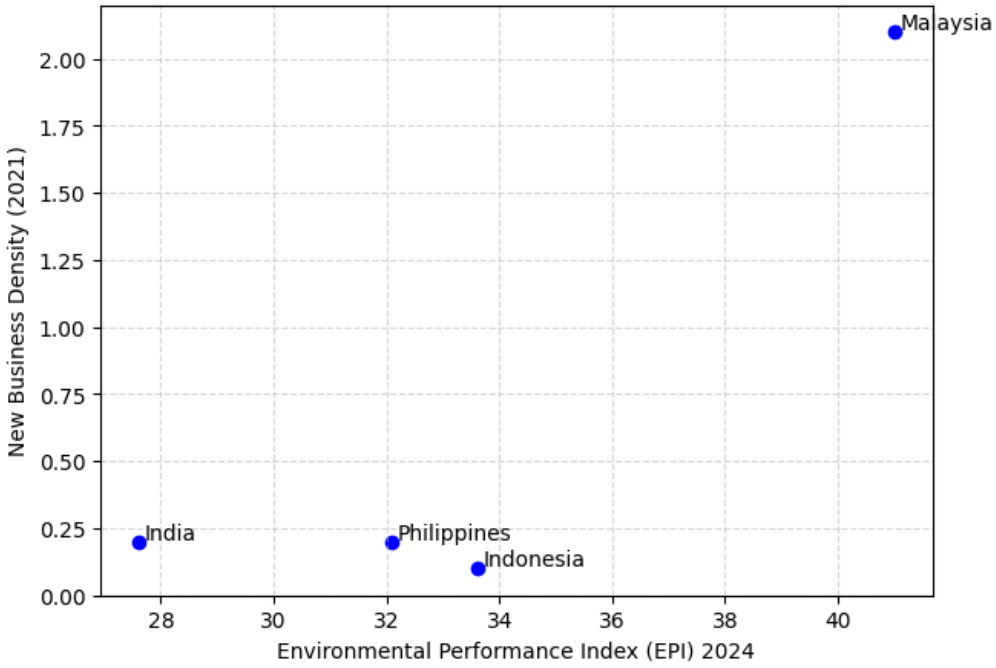

Figure 1: Environmental Performance Index vs New Business Density

Figure 1 shows a positive association between environmental performance and entrepreneurial activity across the selected countries. Higher EPI scores corresponded with greater new business density, with Malaysia showing the strongest combined performance. The scatter plot suggested that stronger environmental governance may support more favorable conditions for business formation in emerging Asian economies.

3.4 Regression Results: Innovation Output and Entrepreneurship

The regression analysis between innovation output and new business density produced a weak and statistically insignificant relationship. The regression slope was minimal, and the R^2 value indicated that innovation output accounted for only a very small proportion of variance in entrepreneurial activity. This suggested that, within the selected countries, innovation performance did not directly translate into immediate increases in new business creation. The small sample size limited statistical inference; however, the observed pattern implied that innovation systems in emerging Asian economies may not yet strongly influence business formation, or that innovation benefits may accumulate over longer periods than covered in this dataset.

3.5 Regression Results: Renewable Energy and Entrepreneurship

The regression examining renewable energy consumption and new business density showed a negative association. Countries with higher renewable energy shares tended to exhibit lower entrepreneurial formation rates. This pattern was influenced by Malaysia's comparatively low renewable energy consumption but very high business density. The R^2 value was moderately strong, indicating that renewable energy explained a significant portion of the variation in entrepreneurial activity. These results suggested that renewable energy transition levels may not directly drive new business creation in emerging economies; instead, economic structure, industrial composition, and institutional conditions may moderate the sustainability entrepreneurship relationship.

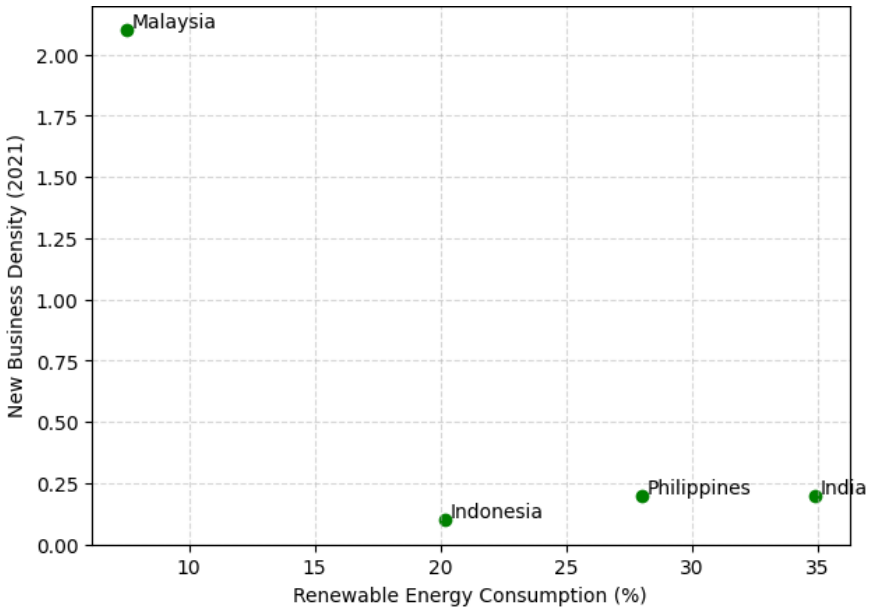

Figure 2: Renewable Energy Consumption vs New Business Density

Figure 2. shows an inverse relationship between renewable energy consumption and new business density across the four countries. Malaysia exhibited the lowest renewable energy share yet the highest entrepreneurial activity, while India displayed the opposite pattern. The scatter plot highlighted how renewable transition levels did not directly correspond with entrepreneurial formation in emerging Asian economies.

3.6 Control Variables Assessment

Control variables demonstrated expected directional patterns. GDP per capita showed a strong positive association with new business density, reflecting that higher-income economies exhibited greater entrepreneurial activity. Mean years of schooling also related positively to entrepreneurship, suggesting the relevance of human capital in opportunity recognition and business formation. Ease of Doing Business scores showed a strong positive association, indicating that supportive regulatory environments facilitated greater business entry. Although these associations were not statistically conclusive due to the limited sample, they aligned with established theoretical and empirical research identifying economic

development, education, and institutional quality as significant entrepreneurial determinants.

3.7 Summary of Key Findings

Overall, results indicated that environmental performance, economic development, and institutional quality were positively associated with entrepreneurial activity among the selected countries. Renewable energy consumption demonstrated an inverse relationship, while innovation output exhibited minimal influence in this sample. Control variables behaved as expected, reinforcing prior evidence on the role of human capital and regulatory environments. Findings were interpreted as exploratory due to the small sample size but offered meaningful preliminary insights into sustainability entrepreneurship dynamics in emerging Asian economies. These results supported the relevance of sustainability readiness and institutional capacity as contextual factors shaping entrepreneurial ecosystems.

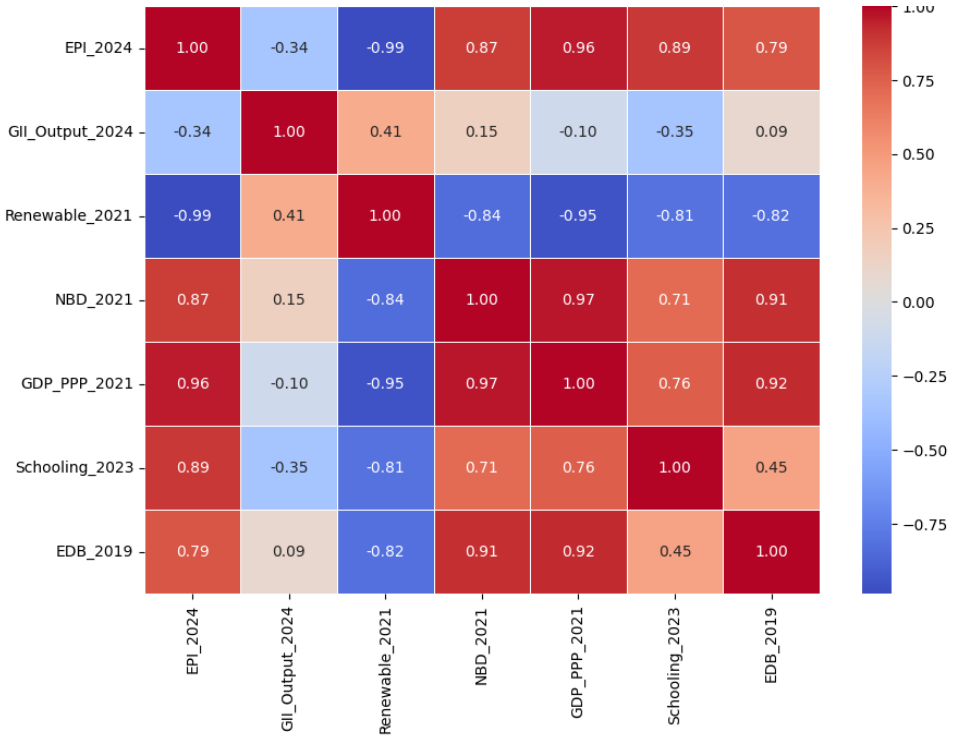

Figure 3: Correlation Heatmap of Sustainability, Innovation, and Entrepreneurship Indicators

Figure 3 shows the strength and direction of relationships among all study variables across the four countries. Strong positive associations appeared between entrepreneurial activity and environmental performance, economic development, schooling, and institutional quality, while renewable energy consumption demonstrated a clear negative relationship. The heatmap visually summarized the interconnected dynamics shaping entrepreneurial ecosystems in emerging Asian economies.

4. Discussion

The findings indicated that environmental performance, economic development, and institutional quality were positively associated with entrepreneurial activity in the selected Asian economies. Countries with stronger sustainability governance, higher income levels, and supportive regulatory frameworks tended to exhibit greater new business formation. Renewable energy consumption showed a negative association with entrepreneurship, likely reflecting transitional energy structures or sector-specific dynamics. Innovation output demonstrated minimal direct influence, suggesting that innovation systems in these economies may not yet translate into immediate entrepreneurial growth. Overall, the results highlighted the complex and context-dependent relationships between sustainability-related indicators and entrepreneurial development in emerging Asian contexts.

These findings carried several important implications for policymakers and practitioners. Strengthening environmental governance, improving regulatory efficiency, and enhancing institutional quality could stimulate entrepreneurial activity. Investing in human capital, particularly education, may further support opportunity-driven entrepreneurship. The negative association between renewable energy use and business density suggested that energy transition policies should be better integrated with entrepreneurship strategies. Governments might encourage green

entrepreneurship through financial incentives, technology support, and sustainability-focused training programs. Overall, the results underscored the need for policies that simultaneously advance environmental sustainability and entrepreneurial development to create resilient, competitive, and inclusive economic systems in emerging Asian economies.

The findings of this study aligned with prior research highlighting the importance of sustainability indicators in shaping entrepreneurial outcomes. The positive association between environmental performance and business activity supported global sustainability assessments such as the Environmental Performance Index (Wendling et al., 2024). The negative relationship between renewable energy use and entrepreneurship reflected earlier evidence suggesting structural and financial constraints in developing countries' energy transitions (Shahbaz et al., 2021; World Bank, 2023a). The limited influence of innovation output was consistent with WIPO's observations that innovation benefits may take time to affect entrepreneurial ecosystems (WIPO, 2024). Overall, patterns matched established global datasets (World Bank, 2023). These results also correspond with evidence from innovation ecosystem research (Vaz, 2020). Further support comes from cross-country analyses of entrepreneurial ecosystems (Pita et al., 2021). Additionally, the patterns align with multi-country findings on sustainable entrepreneurship processes (Proença and Soukiazis, 2023).

The primary limitation of this methodology was the small sample size, which restricted statistical power and prevented the use of multivariate regression models. Findings were exploratory rather than generalizable. Variations in data years, although minimized, introduced potential comparability challenges. Despite these limitations, the methodology provided a coherent framework for examining sustainability entrepreneurship linkages across emerging Asian economies, offering useful insights for future, larger-scale research. Future research could broaden the scope of analysis by including a larger sample of Asian and non-Asian emerging economies to improve generalizability. Longitudinal studies would help track how sustainability indicators and entrepreneurial activity evolve over time. Additional variables such as digital readiness, green financing, and cultural factors could provide deeper insights into ecosystem dynamics. Firm-level data may also reveal mechanisms linking sustainability practices and entrepreneurial decisions. Mixed-method approaches, including qualitative interviews with entrepreneurs and policymakers, could enrich contextual understanding. Such expansions would strengthen theoretical development and offer more comprehensive evidence to guide policy interventions in sustainability-driven entrepreneurship.

5. Conclusion

The study has examined the influence of sustainability-related indicators on entrepreneurial activity across four emerging Asian economies using secondary data from globally recognized sources. The results demonstrated that environmental performance, economic development, and institutional quality were positively associated with new business density, suggesting that stronger sustainability governance, higher income levels, and supportive regulatory environments collectively contributed to more dynamic entrepreneurial ecosystems. Conversely, renewable energy consumption exhibited a negative relationship with entrepreneurial activity, likely reflecting transitional energy structures and differing national priorities. Innovation output showed minimal direct influence, indicating that innovation capacity in these countries may require additional time, resources, and policy alignment before translating into higher business formation. Control variables, including education and ease of doing business, behaved as expected, reinforcing well-established evidence on the importance of human capital and regulatory efficiency for entrepreneurship. Although the small sample size limited statistical generalization, the study offered meaningful exploratory insights into the complex interactions between sustainability and entrepreneurship in emerging Asian contexts. The findings highlighted the need for integrated policy frameworks that support both environmental goals and entrepreneurial growth. Governments should invest in environmental governance, innovation systems, and human capital while ensuring that renewable energy transitions are complemented by opportunities for green entrepreneurship. Future research with larger samples, longitudinal designs, and micro-level data would further advance understanding of sustainability-driven entrepreneurial development and provide stronger foundations for evidence-based policymaking in the region.

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