

Article

Mapping Entrepreneurial Ecosystems for Sustainable Development in a State-Driven Economy

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Abstract

Sustainable development increasingly depends on the capacity of entrepreneurial ecosystems (EEs) to generate resilient, inclusive, and self-reinforcing entrepreneurial activity over time. While prior research has predominantly examined entrepreneurial ecosystems in developed economies, limited empirical evidence exists on how ecosystem components function in collectivist cultures and state-driven developing contexts such as Saudi Arabia. This study examines the influence of key entrepreneurial ecosystem elements on startup formation using a large-scale sample of 4032 Saudi entrepreneurs drawn from the Global Entrepreneurship Monitor (GEM), with a focus on human capital, social capital, and institutional support. The results indicate that human capital and social capital significantly increase the likelihood of startup formation, effectively doubling the chances of entrepreneurial action. In contrast, perceived formal institutional support is negatively associated with startup activity, whereas market dynamics and informal institutions show no statistically significant effects. These findings highlight the distinctive nature of Saudi Arabia's state-driven and socially embedded entrepreneurial ecosystem under Vision 2030, where entrepreneurial activity is shaped more by individual capabilities and social networks than by formal institutional expansion. Adopting a sustainability-oriented entrepreneurial ecosystem perspective, the study demonstrates that sustainable entrepreneurial development in state-driven economies depends on aligning institutional reforms with underlying human and social capacities. The findings provide context-specific insights for policymakers by emphasising the importance of capability building, network formalisation, and culturally aligned regulatory reforms to foster resilient and sustainable entrepreneurship.

Keywords: entrepreneurial ecosystems; Saudi Arabia; Vision 2030; human capital; social capital; institutional support; GEM data; startup activity; sustainable development



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1. Introduction

Entrepreneurial ecosystems (EEs) have emerged as a critical framework for understanding and promoting entrepreneurial activity [1–3]. Beyond their role in stimulating new venture creation, EEs are increasingly recognized as essential for fostering sustainable development, as they shape the long-term capacity of economies to generate resilient, inclusive, and self-reinforcing entrepreneurial activity. Research has demonstrated that ecosystem factors—such as access to finance, supportive policies, and entrepreneurial

networks—significantly enhance entrepreneurship and, in turn, contribute to economic growth [4]. However, the majority of EE studies have focused on mature economies in Europe and North America, where relatively stable institutions, robust financial markets, and well-developed infrastructure dominate the ecosystem landscape [5]. While these studies offer valuable insights, their applicability to developing economies, particularly in the Middle East and North Africa (MENA) region, remains underexplored [6,7].

Saudi Arabia presents a unique and compelling context for entrepreneurial ecosystem research. The country is undergoing a rapid economic transformation under Vision 2030, a national strategy aimed at diversifying the economy and fostering entrepreneurship as a pillar of long-term development [8]. Unlike Western contexts, Saudi Arabia's entrepreneurial ecosystem is characterized by a dominant state role, where formal institutions—such as government-led reforms and initiatives including Monsha'at—interact with deeply rooted informal institutions, including *wasta*-based networks, tribal affiliations, and evolving gender norms [9,10]. This coexistence of strong state intervention and socially embedded informal structures creates a distinct ecosystem configuration that deviates sharply from Western models, yet remains insufficiently examined in the entrepreneurial ecosystem literature [11].

Significant gaps persist in understanding how entrepreneurial ecosystem factors operate in state-driven, rentier economies such as Saudi Arabia. While prior studies acknowledge the importance of institutions, they frequently overlook three critical aspects. First, the role of the state as a primary ecosystem actor shaping entrepreneurial activity through top-down policies, funding mechanisms, and regulatory reforms [12]. Second, the tension between formal institutional reforms and persistent informal constraints, such as cultural resistance to female entrepreneurship despite legal advancements [13,14]. Third, the rapid, policy-induced evolution of entrepreneurial ecosystems in Gulf economies, where institutional change may outpace the development of underlying human and social capabilities necessary for sustainable entrepreneurial activity [15]. Addressing these gaps is essential for developing context-specific entrepreneurial ecosystem policies that align with the realities of developing and state-dominated economies [16].

Contributions to the Literature

This research makes three significant contributions to the entrepreneurship literature, spanning theoretical, empirical, and practical domains.

First, the study offers a theoretical contribution by challenging the direct applicability of Western entrepreneurial ecosystem models and establishing important boundary conditions for their use. The findings demonstrate that in state-driven, rentier economies such as Saudi Arabia, the influence of core ecosystem components differs substantially from patterns observed in mature, market-driven Western contexts. By highlighting how top-down institutional reforms interact with powerful informal institutions, such as *wasta*, the study advances entrepreneurial ecosystem theory through a more nuanced, context-sensitive understanding of sustainable entrepreneurial development [3,16–18].

Second, the study makes a substantial empirical contribution by providing one of the first large-scale quantitative examinations of the Saudi entrepreneurial ecosystem using robust, internationally comparable Global Entrepreneurship Monitor (GEM) data. The results yield counterintuitive yet robust findings—notably, the negative association between perceived formal institutional support and startup activity—that challenge conventional assumptions in the entrepreneurial ecosystem literature [17,19,20]. This moves beyond descriptive case-based accounts to offer generalizable insights into entrepreneurial dynamics within a key Gulf Cooperation Council (GCC) economy, thereby addressing a critical empirical gap [6,7].

Third, the study contributes to policy and practice with direct relevance to Saudi Arabia's Vision 2030. By identifying human and social capital as the primary drivers of startup activity, the findings shift attention away from a purely policy-centric approach toward one that prioritizes capability building and network formalization. These insights provide actionable guidance for policymakers in Saudi Arabia and similar state-dominated economies, supporting more effective resource allocation and fostering entrepreneurial ecosystems that are better positioned to sustain entrepreneurial activity over the long term [8,16].

Moreover, this study also contributes to the United Nations Sustainable Development Goals (SDGs) by advancing understanding of how entrepreneurial ecosystems can support long-term, sustainable economic transformation in state-driven economies. Specifically, the findings align with SDG 8 (Decent Work and Economic Growth) by identifying ecosystem configurations that foster durable entrepreneurial activity, employment generation, and capability development beyond short-term policy incentives. In addition, the study speaks to SDG 9 (Industry, Innovation, and Infrastructure) by highlighting the role of human and social capital in strengthening innovation-oriented entrepreneurial systems and reducing reliance on fragile, policy-dependent institutional support. By empirically mapping ecosystem components that enable resilient and self-sustaining entrepreneurship, the study provides policy-relevant insights for designing entrepreneurial ecosystems that support sustainable development objectives in emerging and transforming economies.

The remainder of the manuscript is structured as follows. Section 2 presents an adapted theoretical framework for the Saudi context. Section 3 outlines the empirical approach using GEM data. Section 4 reports the empirical findings. Section 5 discusses the theoretical and policy implications for sustainable development, and limitations and directions for future research, and Section 6 provides conclusion

2. Theoretical Framework and Hypotheses Development

From a sustainability perspective, entrepreneurship is increasingly viewed not only as an engine of venture creation but as a mechanism for building long-term economic resilience, adaptive capacity, and self-reinforcing development trajectories. Accordingly, this study adopts a sustainable entrepreneurial ecosystem perspective, in which ecosystem components are evaluated based on their ability to support enduring entrepreneurial activity rather than short-term startup entry alone. This framing allows us to examine how human capital, social structures, institutions, and market dynamics contribute to the sustainability of entrepreneurial activity over time, particularly in state-driven economies undergoing rapid structural transformation.

2.1. Entrepreneurship

Entrepreneurship encompasses the identification and exploitation of opportunities to create value, with foundational theories offering distinct perspectives: Schumpeter [21] emphasized innovation-driven creative destruction, where entrepreneurs disrupt markets through novel combinations; Kirzner [22] focused on alertness to profit opportunities in market inefficiencies; while Shane and Venkataraman [23] integrated these views in their opportunity nexus framework, defining entrepreneurship as the interplay of individuals, opportunities, and context. A critical distinction exists between entrepreneurial intentions (cognitive plans to start ventures) and actions (actual startup behaviors), with the intention-action gap influenced by institutional, cultural, and resource factors [24]. In this study, entrepreneurial action is therefore conceptualised not only as venture initiation but as an early indicator of sustainable entrepreneurial capacity, reflecting the extent to which individuals are able to translate opportunities into durable economic activity within a given ecosystem.

2.2. Entrepreneurship Ecosystem

An entrepreneurial ecosystem (EE) represents the interdependent actors (entrepreneurs, institutions), factors (policies, markets), and cultural norms that collectively enable venture creation in a territory [3]. Stam's systemic framework identifies networks, leadership, and finance as core components, while Isenberg [25] emphasizes six domains: policy, finance, culture, supports, human capital, and markets. These frameworks highlight that ecosystems are place-based (rooted in local contexts) and multi-level (combining macro-institutions with micro-level agency), with recent adaptations for developing economies emphasizing the state's catalytic role [26]. The key to ecosystem effectiveness is the interaction quality between components rather than their isolated presence. From a sustainable development perspective, the effectiveness of an entrepreneurial ecosystem lies in its capacity to generate self-sustaining entrepreneurial dynamics, that is, systems in which entrepreneurial activity persists beyond temporary policy interventions and is supported by enduring human, social, and institutional foundations. In state-driven economies, this sustainability challenge is particularly salient, as rapid institutional expansion may not translate into long-term entrepreneurial resilience if ecosystem components are weakly aligned or overly policy-dependent.

2.2.1. Social & Cultural Support

The proposition that higher social status of entrepreneurs increases entrepreneurial activity finds strong theoretical grounding in social cognitive theory [27] and institutional theory [28]. Social cognitive theory suggests that when society accords high status to entrepreneurs, it enhances potential founders' self-efficacy and perceived capabilities to launch ventures. Institutional theory complements this by highlighting how social legitimacy facilitates resource acquisition and reduces barriers to entry [29]. Empirical evidence from Global Entrepreneurship Monitor (GEM) data consistently shows that countries where entrepreneurship is viewed as a prestigious career path demonstrate significantly higher rates of Total Early-Stage Entrepreneurial Activity (TEA) [30]. The Middle Eastern context presents particularly compelling evidence, with studies demonstrating that in Saudi Arabia, tribal and familial prestige serve as powerful motivators for entrepreneurial entry [9]. Cross-cultural research further confirms this relationship across both collectivist cultures like the Gulf region and individualist societies such as the United States [31]. The mechanism appears to operate through multiple channels: enhanced founder confidence, improved access to networks and resources, and greater cultural validation of entrepreneurial career paths. Based on this discussion, the following hypothesis is proposed:

Hypothesis 1a. *Higher social status of entrepreneurs increases entrepreneurial action.*

The hypothesis linking positive media coverage to increased startup activity draws from institutional theory's emphasis on informal institutions [32] and agenda-setting theory [33]. Robust empirical evidence supports this relationship, with GEM data indicating that nations with frequent, positive media coverage of entrepreneurs exhibit 15–20% higher startup rates [34]. The Saudi context provides a particularly vivid illustration of this dynamic—following the 2018 social reforms coupled with strategic media campaigns, women's entrepreneurial activity increased by approximately 30% [14]. Studies have further validated this relationship, demonstrating that controlled exposure to entrepreneurial media content can increase entrepreneurial intentions [35]. The media's influence operates through several pathways: raising awareness of entrepreneurial opportunities, providing vicarious learning through role models, and reshaping societal attitudes toward business ownership. Drawing from the preceding theoretical and empirical analysis, we propose the following hypotheses:

Hypothesis 1b. *Positive media coverage of entrepreneurship increases startup activity.*

2.2.2. Institutional Support

From a theoretical perspective, institutional theory [28] suggests that formal institutions reduce uncertainty and transaction costs, thereby encouraging entrepreneurial activity. This aligns with Baumol's framework [36], which posits that the institutional environment determines whether entrepreneurship manifests in productive or unproductive forms. In the Saudi context, Vision 2030's regulatory reforms, including streamlined business registration and improved bankruptcy laws [8], exemplify how institutional support can foster productive entrepreneurship by lowering barriers to entry and operation.

Empirical evidence consistently supports this relationship. Global studies demonstrate that regulatory efficiency significantly impacts entrepreneurial activity—the World Bank's Doing Business Report [37] found that a 10% improvement in business regulations correlated with a 3–5% increase in new firm registrations. This relationship holds particularly true in the MENA region, where Haddad et al. [10] found that stronger contract enforcement in GCC countries was associated with 30% higher rates of early-stage entrepreneurship. This relationship holds particularly true in the MENA region, where stronger contract enforcement in GCC countries was associated with 30% higher rates of early-stage entrepreneurship [10]. In Saudi Arabia specifically, the introduction of digital business registration through platforms like Monsha'at reduced startup time from 64 days to just 3 days, contributing to a 27% increase in new SME registrations [38]. Consistent with mainstream institutional theory, we hypothesize a positive relationship between regulatory support and entrepreneurial activity; however, from a sustainability-oriented perspective, we acknowledge that this relationship may be contingent on the alignment between formal institutions and underlying human and social capacities, particularly in state-driven economies.

Hypothesis 2. *Better ease of doing business (regulatory, legal) increases entrepreneurship.*

2.2.3. Market Dynamics

Drawing from opportunity recognition theory [23], this relationship is rooted in the fundamental premise that entrepreneurship emerges when individuals identify and act upon market gaps. Kirzner's alertness theory [39] further explains how entrepreneurs discover opportunities through their ability to recognize market inefficiencies, while Sarasvathy's effectuation theory [40] suggests that entrepreneurial action often begins with perceived market potential rather than formal planning. These theoretical foundations are particularly relevant in the Saudi context, where Vision 2030 has actively created new market opportunities in sectors like renewable energy, tourism, and fintech [8].

Empirical evidence consistently demonstrates this relationship across global and regional contexts. The Global Entrepreneurship Monitor reports that economies with higher perceived opportunities consistently exhibit greater early-stage entrepreneurial activity [30]. Davidsson's research specifically found that individuals who perceive strong market demand are 2.5 times more likely to start a business [41]. In the Saudi context, the digital transformation wave has led to a 40% increase in tech startups since 2018 [42], with entrepreneurs entering mega-project-related sectors like NEOM and Red Sea Tourism reporting significantly higher rates of opportunity-driven entrepreneurship [43].

Hypothesis 3. *Perceived market opportunities positively influence entrepreneurial action.*

2.2.4. Human Capital

The relationship between human capital and entrepreneurial activity is well-established in the literature. The hypothesis posits that entrepreneurial knowledge and skills increase startup likelihood, which finds strong support in human capital theory [44]. This theoretical foundation suggests that individuals with greater business-related competencies—including financial literacy, strategic planning, and industry-specific expertise—are better equipped to launch and sustain ventures [45]. The concept of entrepreneurial self-efficacy further reinforces this relationship, explaining how individuals with stronger skills develop greater confidence in their ability to perform critical entrepreneurial tasks such as securing funding and managing operations [27]. In the Saudi context, these theoretical perspectives are particularly relevant given Vision 2030's emphasis on human capital development through initiatives like the Entrepreneurship Institutes Program and Monsha'at Academy [8].

Empirical evidence consistently supports the human capital–entrepreneurship link. Global meta-analyses demonstrate that formal entrepreneurship education can increase startup rates by 20–30% [46], while Global Entrepreneurship Monitor data reveals that individuals who perceive themselves as having adequate skills are three times more likely to start businesses [30]. Saudi-specific research shows particularly strong effects, with graduates of KAUST's entrepreneurship programs exhibiting 50% higher venture survival rates [47]. These findings suggest that human capital development initiatives in Saudi Arabia are yielding measurable impacts on entrepreneurial outcomes.

Hypothesis 4a. *Entrepreneurial knowledge & skills increase startup likelihood.*

The proposition that strong networking abilities enhance entrepreneurial engagement draws from social capital theory [48] and Granovetter's foundational work on the strength of weak ties [49]. These theoretical perspectives highlight how networks provide access to critical resources including funding, mentorship, and market opportunities. The value of networking appears particularly pronounced in collectivist cultures like Saudi Arabia, where *wasta* (informal networks) plays a significant role in facilitating trust-building and resource mobilization [21]. Empirical studies confirm these relationships, showing that entrepreneurs with mentor networks secure funding 2.5 times faster than those without such connections [50]. In Saudi Arabia, startups leveraging *wasta* networks report 40% faster licensing approvals [9], underscoring the practical value of networking in the local entrepreneurial ecosystem.

These findings have important policy implications for Saudi Arabia's entrepreneurial development. The support for Hypothesis 4a validates the country's ongoing education reforms, particularly the STEM-focused curricula promoted under Vision 2030. Meanwhile, the evidence for Hypothesis 4b suggests opportunities to formalize networking support through platforms like Qiwa that can help democratize access to valuable connections. However, researchers should note potential limitations including cultural biases in skill perception (as captured in GEM surveys) and the effects of network homogeneity in relatively closed economies—factors that may require qualitative methods for fuller understanding. Future research could productively compare the relative efficacy of formal education versus informal *wasta* networks in driving Saudi startup success, providing more nuanced guidance for human capital development strategies.

Hypothesis 4b. *Strong networking abilities enhance entrepreneurial engagement.*

3. Materials and Methods

3.1. Measures

3.1.1. Dependent Variable (Entrepreneurship Action)

This variable was measured using the GEM survey question: “Are you, alone or with others, currently trying to start a new business, including any self-employment or selling any goods or services to others?” (Binary: Yes/No). This measure is the established GEM operationalization of Total Early-Stage Entrepreneurial Activity (TEA) and serves as a validated, cross-nationally comparable indicator of actual startup behavior, extensively used in entrepreneurship research [30,51].

3.1.2. Independent Variables (Ecosystem Components)

Social & Cultural Support: This component was measured using two factors:

Social status of entrepreneurs (GEM: “In my country, successful entrepreneurs have high status”). This perceptual measure is a well-established proxy for the social legitimacy and desirability of entrepreneurship, a key informal institutional factor rooted in institutional theory [28,29]. Its use is validated in GEM-based studies examining societal norms [30].

Media support (GEM: “You often see stories about successful entrepreneurs in the media”). This item captures the agenda-setting role of media in shaping entrepreneurial culture [33] and has been empirically linked to variations in national entrepreneurial activity in prior research [34].

Institutional Support: This component was measured using the question “In your country, it is easy to start a business.” This perceptual measure of regulatory quality and administrative burden aligns with institutional theory’s emphasis on transaction costs [28] and Baumol’s framework [36]. It is a standard GEM indicator that correlates with objective ease of doing business metrics and influences entrepreneurial entry [30,37].

Market Dynamics: This was proxied through market opportunities (GEM: “In the next 6 months, there will be good opportunities for starting a business”). This measure directly reflects the core tenet of opportunity recognition theory [23] and Kirznerian alertness [39]. It is a widely used and validated predictor in GEM studies, where it consistently differentiates between opportunity-driven and necessity-driven entrepreneurship [30,52,53].

Human Capital: This component was measured using two factors:

Entrepreneurial knowledge & skills (GEM: “I have the knowledge/skills to start a business”). This self-efficacy measure is a cornerstone of human capital theory in entrepreneurship [44,45,54] and is one of the strongest and most consistent predictors of startup likelihood in the GEM dataset and meta-analyses [30].

Networking abilities (GEM: “I know someone who started a business in the past 2 years”). This variable is a standard GEM proxy for access to entrepreneurial social capital and the “strength of weak ties” [49,52]. It measures exposure to role models and potential mentors, which facilitates resource acquisition and is a critical factor in venture creation [50].

3.1.3. Control Variables

Age and Gender are standard demographic controls in entrepreneurship studies [30,55].

Fear of failure (GEM: “Fear of failure would prevent me from starting a business”) is a key perceptual variable in the GEM framework, capturing a critical cognitive barrier to entrepreneurial action as theorized in behavioral models of entrepreneurship [24].

In addition, respondents’ income level and educational attainment were included as socio-economic control variables, as prior research suggests that financial resources and human capital significantly influence individuals’ likelihood of engaging in entrepreneurial activity.

3.2. Data

The data used in this study were obtained from the Global Entrepreneurship Monitor (GEM) Adult Population Survey (APS), which is one of the largest international datasets on entrepreneurial activity. The GEM APS employs a stratified random sampling methodology designed to generate nationally representative samples of the adult population aged 18–64 years. In each participating country, professional survey agencies administer standardized questionnaires using structured interviews or online survey methods in accordance with GEM methodological guidelines. The sampling framework ensures proportional representation across key demographic characteristics such as gender, age groups, and geographic regions, thereby enhancing the representativeness and comparability of the data across countries. The minimum sample size required by the GEM methodology is 2000 respondents per country to achieve reliable national estimates of entrepreneurial activity. In the case of Saudi Arabia, the 2021 APS dataset includes 4032 respondents, exceeding this minimum threshold and providing a robust empirical basis for analyzing entrepreneurial ecosystem dynamics.

3.2.1. Rationale for Country Choice

This study selects Saudi Arabia as its empirical context due to its distinctive position as a rentier state undergoing a rapid, state-led economic transformation under Vision 2030. This transformation provides an important opportunity to examine how entrepreneurial ecosystems function in environments where formal institutional reforms are driven from the top and interact with deeply rooted informal institutions such as tribal affiliations and family-based networks (*wasta*) [9,10,19]. Such institutional duality distinguishes Saudi Arabia from Western entrepreneurial ecosystems and makes it an analytically suitable case for understanding EE dynamics in state-dominated and resource-rich economies [12,15,20]. In addition, GEM global reports consistently rank Saudi Arabia as one of the strongest entrepreneurial environments, with high levels of opportunity perception, entrepreneurial capabilities, and institutional support [56–58]. These characteristics collectively justify the selection of Saudi Arabia as a relevant and timely context for investigating ecosystem–entrepreneurship linkages during a national transformation period.

3.2.2. Sample Criteria

The data for this study were drawn from the Global Entrepreneurship Monitor (GEM) Adult Population Survey (APS) for Saudi Arabia for the year 2021. The GEM APS employs a stratified random sampling technique designed to yield a nationally representative sample of adults aged 18–64 years [30,53]. To maintain analytical rigor and ensure consistency with GEM methodological standards, the following inclusion criteria were applied:

1. Respondents must fall within the GEM-defined working-age range of 18–64 years [30].
2. Respondents must have completed all core APS items required for measuring entrepreneurial action (TEA) and the ecosystem constructs included in the model [51].
3. Respondents with substantial missing values on key study variables were removed using listwise deletion to preserve the validity and comparability of the analytical dataset [51].

3.2.3. Determination of the Final Sample

The Saudi Arabian GEM APS comprised 4032 respondents, exceeding GEM’s global benchmark of a minimum of 2000 adults per country, which ensures adequate statistical reliability and representativeness for cross-national comparison [30,53]. After applying the inclusion criteria and removing cases with incomplete responses, the final analytical

sample used in this study consisted of 4032 valid cases, given the very low proportion of missing data across APS variables.

The validity and robustness of the GEM dataset have been extensively established in prior research. Cross-national validation studies show strong correlations ($r = 0.82$) between GEM's Total Early-Stage Entrepreneurial Activity (TEA) rates and official business registration data across 40 countries, confirming the accuracy of GEM measures in capturing real entrepreneurial behavior [51]. GEM's perceptual indicators have demonstrated predictive validity, with entrepreneurial intention measures forecasting actual start-up activity within 12–18 months with 74% accuracy [52]. Methodological evaluations further confirm that national samples of at least 2000 respondents achieve 95% confidence levels with $\pm 2.2\%$ margins of error [53]. Longitudinal analyses document high test–retest reliability (0.91) for core GEM constructs across 60 countries over a decade [54]. In the Saudi context specifically, GEM-reported sectoral entrepreneurial distributions show 89% consistency with administrative records from Monsha'at, validating the local representativeness of the APS [9]. Strong correlations between GEM's opportunity perception indicators and actual market growth in GCC economies ($\beta = 0.68$, $p < 0.01$) further support the construct validity of the dataset [56].

Taken together, these methodological strengths provide a robust empirical foundation for analyzing the entrepreneurial ecosystem in Saudi Arabia and ensure that the final sample used in this study is both statistically and substantively representative of the national adult population.

3.2.4. Perceptual Measures and Sample Representativeness

Because several variables in the GEM APS are perceptual in nature (e.g., opportunity perception, skills, fear of failure), the potential for response bias must be acknowledged. However, GEM indicators have demonstrated strong predictive and convergent validity in prior studies, including high correlations with official business registration rates and sectoral distributions [56,58]. In the Saudi context, GEM-reported entrepreneurial patterns show up to 89% consistency with Monsha'at administrative records, helping mitigate concerns around perceptual inflation [9].

The 2021 Saudi APS sample was collected through stratified random sampling to ensure proportional representation by gender, age group, and region [30,53]. To illustrate this representativeness, subgroup characteristics are provided in Appendix A, showing balanced gender participation (57.4% male; 42.6% female), broad age distribution (e.g., 25–34: 27.2%; 35–44: 30.4%), and education and employment profiles consistent with national demographic patterns. These subgroup distributions confirm that the sample accurately reflects the Saudi adult population, thereby strengthening the validity of the analysis.

3.3. Logistic Regression Model

The use of logistic regression in this study is strongly justified by both methodological considerations and established research practices in entrepreneurship studies. As our dependent variable, entrepreneurial action, is measured as a binary response (whether respondents are currently trying to start a business or not), logistic regression provides the most appropriate analytical framework [59]. This method is particularly well-suited for examining how various ecosystem factors influence the probability of entrepreneurial engagement while controlling for key demographic characteristics. Unlike linear regression, which can produce implausible predictions outside the 0–1 probability range, logistic regression ensures that all predicted probabilities remain within meaningful bounds, making it the natural choice for binary outcome variables [60]. Several key advantages make logistic regression an ideal tool for analyzing the impacts of entrepreneurial ecosystems. First, the

method's ability to handle mixed variable types accommodates our study's combination of continuous Likert-scale measures (e.g., perceptions of ease of business) and categorical predictors (e.g., age groups, gender) in a unified analytical framework [61]. Second, the exponentiated coefficients (odds ratios) provide intuitive, policy-relevant insights about how each ecosystem component influences startup likelihood [62]. For instance, an odds ratio of 1.5 for entrepreneurial skills would indicate a 50% greater likelihood of startup activity among individuals with these skills, providing clear guidance for policymakers. Third, logistic regression has been widely validated in Global Entrepreneurship Monitor (GEM)-based studies, including seminal work by Arenius and Minniti [63] on entrepreneurial perceptions and Reynolds et al. [51] in cross-national comparisons of entrepreneurial activity.

The robustness of logistic regression with large samples further supports its use in this study. With 4032 Saudi respondents, our dataset comfortably meets the "events per variable" requirement (a minimum of 10–20 cases per predictor) recommended by Peduzzi et al. [64] for producing stable parameter estimates. This substantial sample size ensures sufficient statistical power to detect meaningful effects while controlling for multiple predictors. Recent applications in similar Middle East contexts, such as Hattab's analysis of entrepreneurial drivers in Gulf economies [43], further demonstrate the method's appropriateness for our research context.

We address potential limitations of logistic regression through several validation approaches. Multicollinearity is checked via variance inflation factor (VIF) correlation tests [65], while model fit is assessed using Hosmer–Lemeshow tests [66]. We report both coefficients and marginal effects to ensure a comprehensive interpretation of results [67]. While alternative approaches like probit regression could be considered for binary outcomes, logistic regression remains preferable due to its more interpretable odds ratios and wider adoption in comparable studies [68]. The method's ability to provide clear, actionable insights about ecosystem influences on entrepreneurial action makes it particularly valuable for both academic and policy audiences.

The established track record of logistic regression in entrepreneurship research, combined with its particular suitability for our binary outcome variable and mixed predictor types, makes it the optimal analytical choice for this study. By employing this method, we ensure that our findings are both methodologically rigorous and practically interpretable, allowing us to make meaningful contributions to understanding how Saudi Arabia's entrepreneurial ecosystem influences startup activity during the implementation period of its Vision 2030.

The study employs binary logistic regression to estimate the impact of entrepreneurial ecosystem components on the likelihood of entrepreneurial action. The model is specified as follows:

Logistic Regression Equation

$$\text{Log}(1 - p) = \beta_0 + \beta_1 (\text{Social Status}) + \beta_2 (\text{Media Support}) + \beta_3 (\text{Ease of Business}) + \beta_4 (\text{Market Opportunities}) + \beta_5 (\text{Entrepreneurial Skills}) + \beta_6 (\text{Networking}) + \gamma (\text{Controls}) + \epsilon$$

where

p = Probability of entrepreneurial action (Yes = 1, No = 0)

β_0 = Intercept

β_1 to β_6 = Coefficients for ecosystem components

γ = Vector of coefficients for control variables (Age, Gender, Fear of Failure)

ϵ = Error term

4. Results and Findings

4.1. Descriptive Statistics

Table 1 presents key descriptive statistics for all variables included in the study, drawn from a sample of approximately 4000 Saudi respondents. The dependent variable, Entrepreneurship (measured as a binary indicator of whether respondents are currently trying to start a business), shows that 23% of the sample reported entrepreneurial engagement (mean = 0.23). This proportion aligns with Global Entrepreneurship Monitor benchmarks for middle-income economies [30] and reflects Saudi Arabia's growing entrepreneurial activity under Vision 2030.

Table 1. Descriptive Statistics.

Variables	N	Minimum	Maximum	Mean	Std. Dev.
Age	4029	18	64	37.17	10.816
Gender	4032	1	2	1.43	0.495
Education	4029	0	1720	1305.94	129.389
Income	4009	33	68,100	27,368.83	32,302.091
Fear of failure	4026	1	5	3.31	1.528
Entrepreneurial skills	4026	1	5	3.31	1.528
Networking abilities	4020	1	5	4.16	1.016
Entrepreneurial status	3989	0	3	0.87	0.898
Media support	4020	1	5	4.41	0.809
Ease of doing business	4016	1	5	4.31	0.877
Market opportunities	4016	1	5	4.28	0.945

The ecosystem components demonstrate generally positive perceptions among respondents. Social and cultural support variables show high averages (social status mean = 4.41; media support mean = 4.31 on 1–5 scales), indicating strong societal approval of entrepreneurship in Saudi Arabia. These scores exceed regional averages reported in GEM's MENA [69], possibly reflecting deliberate cultural transformation efforts under Vision 2030. Government support, represented by ease of doing business perceptions (mean = 4.28), suggests respondents acknowledge recent regulatory improvements, though the relatively higher standard deviation (0.945) points to varying experiences across demographic groups.

Market dynamics show the highest average score among all variables (market opportunities mean = 4.53), consistent with Saudi Arabia's economic expansion and giga-project investments [42]. The modest standard deviation (0.838) indicates broad consensus about favorable business conditions. Human capital measures reveal strong self-assessed entrepreneurial skills (mean = 4.16) but more limited networking abilities (mean = 0.87 on a 0–3 scale). This discrepancy may reflect cultural factors in professional networking or differences in measurement scales.

Control variables show expected distributions: the age range (18–64, mean = 37.17) captures Saudi's youthful demographic profile, while gender coding (mean = 1.43 where 1 = male, 2 = female) indicates a 57% male sample. Fear of failure scores (mean = 3.31 on 1–5 scale) suggest moderate risk aversion, consistent with previous Saudi entrepreneurship studies [9].

The high valid N (3932 listwise) demonstrates excellent data completeness, with minimal missing values (<3% for any variable). All variables show appropriate ranges without floor/ceiling effects (except the binary dependent variable), supporting their use

in subsequent multivariate analysis. The standard deviations indicate sufficient variation for detecting relationships; however, the relatively high mean scores on perception-based measures (all >4 on 5-point scales) may reflect a positive response bias common in Arab survey research [70], suggesting a cautious interpretation of absolute values.

These descriptive results provide important context for understanding Saudi Arabia's entrepreneurial landscape, showing generally favorable ecosystem perceptions alongside room for improvement in networking support and risk tolerance. The patterns align with the country's transitional economic status and ongoing institutional reforms, setting the stage for more detailed analysis of how these factors interact to influence startup activity.

4.2. Addressing Skewness and Collinearity Diagnostics

Several perceptual variables in the dataset exhibited relatively high mean scores, with responses clustering toward the upper end of the scale. Such positively skewed distributions are common in cross-cultural survey research conducted in Middle Eastern and collectivist contexts, where respondents often demonstrate optimistic or socially desirable responding patterns. To ensure that this distributional tendency did not compromise the robustness of the analysis, several diagnostic procedures were undertaken.

First, the logistic regression model employed in this study does not require normally distributed independent variables. Consequently, the skewness observed in the perceptual variables does not violate any statistical assumptions associated with the analysis. Second, multicollinearity diagnostics were conducted to determine whether the elevated means and intercorrelations among perceptual predictors introduced instability into the model. As shown in Table 2 all tolerance values exceeded the minimum recommended threshold of 0.10, and all variance inflation factor (VIF) values were well below the conventional cut-off of 10, indicating no presence of multicollinearity. Third, acknowledging that the high perceptual ratings reflect the broader positive sentiment prevalent during the Vision 2030 reform period, the interpretation of the results emphasises the relative magnitude and significance of coefficients rather than the absolute scale levels. Collectively, these steps confirm that the observed skewness does not compromise the validity or interpretability of the findings derived from the logistic regression model.

Table 2. Collinearity Diagnostics for Independent Variables.

Predictor Variable	Tolerance	VIF
Age	0.984	1.016
Gender	0.959	1.043
Education	0.953	1.049
Income	0.942	1.062
Fear of failure	0.952	1.051
Entrepreneurial skills	0.750	1.333
Networking abilities	0.917	1.091
Entrepreneurial status	0.821	1.218
Media support	0.780	1.282
Ease of doing business	0.632	1.583
Market opportunities	0.687	1.456

Note. Tolerance values greater than 0.10 and VIF values less than 10 indicate the absence of multicollinearity among the predictors.

4.3. Logistic Regression Results and Hypothesis Testing

A hierarchical binary logistic regression analysis was carried out to examine the influence of entrepreneurial ecosystem components, human capital-related factors, and demographic controls on entrepreneurial action. The odds ratios for all three models are presented in Table 3, and the model fit statistics are summarised in Table 4.

Table 3. Logistic regression.

	Model 1	Model 2	Model 3
	Exp (B)/OR	Exp (B)/OR	Exp (B)/OR
Age	1.001	0.998	0.998
Gender	0.957	1.150	1.135
Education	1.001 ***	1.001 ***	1.001 ***
Income	1.000 ***	1.000 ***	1.000 ***
Fear of failure	0.855 ***	0.811 ***	0.804 ***
Entrepreneurial skills		1.467 ***	1.521 ***
Networking abilities		2.220 ***	2.184 ***
Entrepreneurial status		0.937	0.967
Media support		0.829	0.864 **
Ease of doing business			−0.824 **
Market opportunities			1.060

Note. OR = Odds Ratio. *** $p < 0.001$; ** $p < 0.01$. A negative sign indicates a negative B value.

Table 4. Model Summary and Goodness of Fit.

	Model 1	Model 2	Model 3
Omnibus Test	0.000	0.000	0.002
Hosmer & Lemeshow Test	0.017	0.165	0.268
Cox & Snell R Square	0.010	0.096	0.118
Nagelkerke R Square	0.015	0.144	0.177

4.3.1. Model 1

Model 1 examined the influence of the control variables, age, gender, education, income, and fear of failure, on entrepreneurial action (see Table 3). The model was statistically significant (Omnibus $p = 0.000$), although the Hosmer–Lemeshow statistic indicated inadequate fit ($p = 0.205$), and the explanatory power remained low (Nagelkerke $R^2 = 0.034$), as shown in Table 4. Among the five predictors, only three were significant, education (OR = 1.001, $p < 0.001$), income (OR = 1.000, $p < 0.001$), and fear of failure (OR = 0.857, $p < 0.001$), indicating that individuals with education and income are likely to start business and who expressed greater fear of failure were less likely to take entrepreneurial action. Neither age (OR = 1.001, $p > 0.1$) nor gender (OR = 0.957, $p > 0.1$) showed significant associations with entrepreneurial behaviour. Since Model 1 includes only control variables, no hypotheses were tested at this stage.

4.3.2. Model 2

Model 2 introduced human capital-related variables (entrepreneurial skills and networking abilities) and socio-cultural ecosystem components (entrepreneurial status and media support), in addition to the controls. As shown in Table 4, this model demonstrated substantial improvement over Model 1, with strong model significance (Omnibus $p = 0.000$), acceptable goodness of fit (Hosmer–Lemeshow $p = 0.259$), and notably higher explanatory power (Nagelkerke $R^2 = 0.182$). According to Table 3, entrepreneurial skills significantly increased the odds of entrepreneurial action (OR = 1.467, $p < 0.001$), providing support for H4a, while networking abilities emerged as an even stronger predictor (OR = 2.220, $p < 0.001$), offering strong support for H4b. In contrast, entrepreneurial status (OR = 0.937) did not significantly influence entrepreneurial action, thus providing no support for H1a, and media support (OR = 0.829) was also non-significant, resulting in no support for H1b at this stage. Fear of failure remained a significant negative predictor (OR = 0.811, $p < 0.001$).

Overall, Model 2 highlighted the central role of human capital and social capital in driving entrepreneurial behaviour.

4.3.3. Model 3

Model 3 incorporated broader institutional ecosystem components—ease of doing business and market opportunities—along with all predictors from the previous models. As indicated in Table 4, this final model demonstrated the strongest performance, with a non-significant Hosmer–Lemeshow statistic ($p = 0.141$), the highest explanatory power (Nagelkerke $R^2 = 0.186$), and continued overall model significance (Omnibus $p = 0.002$). The odds ratios presented in Table 3 show that entrepreneurial skills ($OR = 1.521, p < 0.001$) and networking abilities ($OR = 2.184, p < 0.001$) remained robust and significant predictors, reaffirming support for H4a and H4b. Fear of failure again exerted a significant negative influence on entrepreneurial action ($OR = 0.804, p < 0.001$).

At the ecosystem level, media support became statistically significant but demonstrated a negative effect ($OR = 0.864, p < 0.01$), contradicting the hypothesised positive relationship and therefore not supporting H1b. Similarly, ease of doing business was significant with a negative coefficient ($B < 0; OR < 1, p < 0.001$), contrary to expectations, providing no support for H2. Market dynamics remained non-significant ($OR = 1.060, p > 0.1$), resulting in no support for H3. Entrepreneurial status also remained non-significant ($OR = 0.967, p > 0.1$), reaffirming the lack of support for H1a.

5. Discussion

The findings provide a deeper understanding of how entrepreneurial action in Saudi Arabia is shaped by the interaction of individual capabilities, social structures, and ecosystem-level conditions within a state-driven economy. From a sustainability perspective, the results suggest that entrepreneurial activity is less a function of broad institutional expansion and more dependent on the development of durable human and social foundations that support long-term entrepreneurial capacity.

Consistent with prior Global Entrepreneurship Monitor (GEM) studies, fear of failure emerged as a strong and persistent deterrent to entrepreneurial action [9,30]. This finding reinforces existing evidence that psychological barriers continue to constrain entrepreneurial behaviour even in ecosystems undergoing rapid reform. From a sustainability lens, fear of failure represents a critical impediment to resilient entrepreneurial systems, as risk aversion limits experimentation, learning, and the renewal of entrepreneurial activity over time. This aligns with earlier research emphasizing that cognitive constraints can significantly restrict action-oriented entrepreneurship in MENA contexts [24].

Human capital and social capital—particularly entrepreneurial skills and networking abilities—were the strongest predictors of entrepreneurial action. This finding is consistent with capability-based perspectives and prior Saudi-focused research highlighting the central role of skills development and informal networks such as *wasta* in entrepreneurial processes [8,43]. Importantly, these results underscore that sustainable entrepreneurial ecosystems are built on adaptive capabilities and social embeddedness rather than solely on formal institutional support. The strong effect of networking further supports Granovetter’s weak-ties argument [49], suggesting that opportunity mobilisation in Saudi Arabia relies heavily on relational mechanisms that enable access to information, resources, and legitimacy over time.

A key divergence from mainstream entrepreneurial ecosystem research concerns the regulatory environment. Contrary to theoretical expectations and prior empirical evidence suggesting that favourable business conditions stimulate entrepreneurial activity [30,38], perceived ease of doing business exhibited a significant negative association with en-

trepreneurial action. From a sustainability-oriented perspective, this finding suggests that rapid, top-down institutional reforms may generate misalignment or dependency effects when they are not accompanied by corresponding development of human capabilities and social readiness. Similar counterintuitive institutional effects have been observed in transitional economies, where regulatory reforms do not immediately translate into behavioural engagement due to implementation gaps or discrepancies between perceived and experienced institutional conditions [16]. This pattern is also consistent with the perception–action gap identified in opportunity recognition research [23].

Media support likewise demonstrated a negative association with entrepreneurial action in the full model. While prior GEM studies suggest that positive media visibility encourages entrepreneurship [30,33], emerging evidence from Gulf contexts indicates that media narratives often emphasise exceptional success stories, potentially discouraging action among typical potential entrepreneurs [10]. From a sustainability perspective, such narratives may undermine entrepreneurial resilience by creating unrealistic benchmarks that widen the gap between aspiration and perceived feasibility, thereby weakening sustained entrepreneurial engagement.

A deeper interpretation of these counterintuitive findings can be developed by considering the interaction between institutional reforms, individual capabilities, and behavioral responses within entrepreneurial ecosystems. One explanation relates to the phenomenon of institutional–capability misalignment, which is particularly relevant in state-driven economies undergoing rapid structural transformation. In such contexts, institutional reforms are often implemented through top-down policy initiatives designed to accelerate economic diversification and stimulate entrepreneurial activity. While these reforms may successfully improve regulatory frameworks, administrative procedures, and formal support structures, the development of entrepreneurial capabilities—such as opportunity evaluation, managerial skills, and resource mobilization—typically evolves more gradually. When institutional expansion outpaces the development of human and social capital, individuals may perceive the business environment as increasingly supportive while still lacking the practical capacity, confidence, or networks necessary to initiate entrepreneurial action. This misalignment can produce a paradoxical statistical relationship in which favorable institutional perceptions coexist with lower levels of entrepreneurial engagement.

A second mechanism relates to the perception–action gap identified in behavioral models of entrepreneurship. According to the Theory of Planned Behavior [71] and opportunity recognition theory [23], entrepreneurial action depends not only on perceived opportunities or supportive institutional conditions but also on perceived behavioral control and self-efficacy. Individuals may recognize favorable market or regulatory conditions but still refrain from entrepreneurial action if they perceive substantial risks or lack confidence in their ability to manage business uncertainty. The strong negative effect of fear of failure observed in the present study reinforces this interpretation, suggesting that psychological barriers may prevent individuals from translating favorable ecosystem perceptions into entrepreneurial behavior. In this sense, ecosystem perceptions alone may be insufficient to generate sustained entrepreneurial activity unless they are accompanied by stronger capability development and confidence-building mechanisms.

The negative association between media support and entrepreneurial action may be explained through aspirational entrepreneurial narratives and social comparison effects. Media portrayals of entrepreneurship frequently highlight exceptional success stories, high-growth startups, and visionary founders. Although such narratives aim to inspire entrepreneurial participation, they may unintentionally raise perceived thresholds of success. When entrepreneurship is presented primarily through extraordinary achievements, potential entrepreneurs may perceive a substantial gap between their own capabilities

and the accomplishments of celebrated founders. This social comparison dynamic may discourage entrepreneurial action among individuals who perceive themselves as lacking comparable resources or experience. In rapidly transforming ecosystems such as Saudi Arabia, where entrepreneurship promotion under Vision 2030 has been accompanied by extensive media coverage of high-profile ventures and flagship projects, such aspirational narratives may elevate admiration for entrepreneurship while simultaneously increasing perceived entry barriers for ordinary individuals.

Taken together, these mechanisms suggest that favorable ecosystem perceptions alone do not automatically translate into entrepreneurial action. Instead, sustainable entrepreneurial engagement depends on the alignment between institutional reforms, individual capabilities, and behavioral readiness. In state-driven ecosystems undergoing rapid transformation, policies aimed at expanding formal institutional support may therefore be most effective when complemented by initiatives that strengthen entrepreneurial skills, broaden access to networks, and reduce psychological barriers to entrepreneurial experimentation.

Market opportunities and entrepreneurial status did not exert statistically significant effects on entrepreneurial action. This contrasts with standard opportunity recognition theory [23,39] and institutional perspectives on social legitimacy [27,28]. However, prior research in Saudi Arabia suggests that perceived opportunities alone may be insufficient when individuals face capability gaps, elevated risk perceptions, or limited access to enabling networks [30,41]. These findings further reinforce the argument that sustainable entrepreneurial activity depends less on opportunity abundance or symbolic status and more on the presence of robust individual and social capacities.

Taken together, the results indicate that entrepreneurial action in Saudi Arabia is driven primarily by individual-level capabilities and social networks, while psychological barriers such as fear of failure continue to constrain engagement. Institutional and opportunity-related ecosystem components behave differently than predicted by mainstream models, reflecting the complexities of an economy undergoing rapid transformation under Vision 2030. From a sustainability standpoint, these findings suggest that entrepreneurial ecosystems in state-driven economies are most resilient when policy reforms are aligned with human capital development, social embeddedness, and behavioural readiness.

5.1. Policy and Practical Implications

The findings yield several actionable policy implications for fostering a more sustainable entrepreneurial ecosystem in Saudi Arabia. First, the strong positive effects of entrepreneurial skills and networking abilities highlight the central importance of capability building for long-term entrepreneurial sustainability. Policymakers should continue to expand experiential training, mentorship programs, and practice-oriented education initiatives that enhance opportunity recognition, resource mobilisation, and adaptive problem-solving, particularly among youth and early-stage entrepreneurs [8,43]. Strengthening structured networking platforms—such as incubators, accelerators, and sector-specific entrepreneurial communities—can further support the development of social capital that enables sustained entrepreneurial engagement.

Second, the persistent negative effect of fear of failure underscores the need to address psychological barriers as a core sustainability challenge. Policies aimed at fostering sustainable entrepreneurship should incorporate behavioural and motivational components, including failure recovery mechanisms, risk management training, and public campaigns that normalise experimentation and learning from setbacks. Such interventions are essential for building entrepreneurial resilience and reducing long-term disengagement from entrepreneurial activity [9,30].

Third, the negative association between perceived ease of doing business and entrepreneurial action points to a critical misalignment between institutional reform and entrepreneurial readiness. From a sustainability perspective, policy effectiveness depends not only on regulatory efficiency but also on transparency, accessibility, and experiential support. Enhancing regulatory communication, offering hands-on compliance assistance, and simplifying navigation of institutional processes may help bridge the perception–action gap and reduce reliance on policy optimism alone [16,38].

Fourth, the negative influence of media support suggests the need to recalibrate entrepreneurial narratives. Sustainable entrepreneurial ecosystems benefit from realistic, inclusive portrayals of entrepreneurship that emphasise incremental progress, learning, and diverse entrepreneurial pathways rather than exceptional success stories. Policymakers and media actors should therefore promote narratives that strengthen self-efficacy and long-term engagement among a broad base of potential entrepreneurs [1,10].

Finally, the non-significance of market opportunities and social status highlights that ecosystem-level initiatives must be coupled with individual capability development to translate perceived opportunities into sustained entrepreneurial action. Integrating skills training with sector-specific opportunity mapping, mentorship, and financial preparedness programs may enhance the conversion of opportunity perception into durable entrepreneurial activity [23,41].

Overall, these policy implications point to a shift from policy expansion toward capability alignment, social embeddedness, and behavioural resilience, which are essential foundations for building sustainable entrepreneurial ecosystems under Vision 2030.

5.2. Limitations and Future Research Directions

While this study offers important insights into Saudi Arabia's entrepreneurial ecosystem, several limitations warrant consideration. The reliance on cross-sectional GEM data restricts causal inference and limits insight into how entrepreneurial behaviour and ecosystem perceptions evolve over time. The single-year focus may also reflect short-term dynamics associated with pandemic-related disruptions rather than longer-term sustainability trajectories.

Additionally, the use of perceptual measures, although standard in GEM research, may not fully capture actual institutional performance or lived entrepreneurial experiences. Future studies should combine survey data with qualitative approaches to explore how entrepreneurs interpret regulatory reforms, media narratives, and ecosystem support mechanisms in practice, particularly in relation to sustainability outcomes.

The binary measurement of entrepreneurial action further simplifies the entrepreneurial process by not distinguishing between venture types, growth trajectories, or sectoral differences. Future research could examine how ecosystem effects vary across industries, stages of venture development, and forms of entrepreneurship (e.g., necessity versus opportunity-driven ventures). Longitudinal designs, mixed-methods approaches, and social network analysis would be particularly valuable for understanding how institutional reforms interact with human and social capital over time in rapidly transforming economies.

Another limitation of the study concerns the absence of subgroup-specific analyses. Although age and gender were included as control variables, the analysis does not explicitly examine how ecosystem effects may vary across demographic groups such as women entrepreneurs, youth, or different regional contexts. Saudi Arabia has experienced substantial institutional reforms affecting female labor participation and entrepreneurship under Vision 2030, which may influence entrepreneurial engagement across gender groups. In addition, religious and cultural norms play an important role in shaping institutional expectations and social attitudes toward entrepreneurship in Saudi society. Because the GEM APS dataset does not include direct measures of religiosity or religious institutional influence, this dimension

could not be incorporated into the empirical analysis. Future research using mixed methods or specialized surveys could provide deeper insights into how religious and cultural institutions shape entrepreneurial ecosystems in the Saudi context.

Furthermore, the study focuses on entrepreneurial entry rather than post-entry outcomes such as venture survival or growth. While the GEM Adult Population Survey provides rich information on early-stage entrepreneurial activity, it does not track the long-term performance of individual firms. As a result, the present study examines the ecosystem factors associated with startup initiation but cannot directly assess how these factors influence venture sustainability over time. Future research could extend this work by combining GEM data with longitudinal firm-level datasets to examine how different combinations of ecosystem components—including institutional support, human capital, and informal social networks—affect the survival and growth trajectories of new ventures over several years.

Although the model includes several demographic and socio-economic control variables, including age, gender, income, education, and fear of failure, some potentially relevant factors could not be incorporated due to data limitations. In particular, the publicly available GEM APS dataset used in this study does not provide consistent information on respondents' asset ownership or detailed regional identifiers for the Saudi sample. As a result, the analysis does not directly control for individual asset holdings or regional economic characteristics such as local development levels or industrial structures. Future research using regionally disaggregated datasets or multi-level models could provide deeper insights into how local economic environments interact with individual capabilities and ecosystem conditions to influence entrepreneurial action.

Finally, the study concerns the absence of cross-country or regional comparative analysis. The empirical model focuses exclusively on Saudi Arabia in order to provide a detailed examination of entrepreneurial ecosystem dynamics within a state-driven economy undergoing rapid institutional transformation. While this context-specific focus allows for deeper interpretation of the interaction between institutional reforms, human capital, and social networks under Vision 2030, the findings cannot be directly generalized to other national contexts. Future research could extend the present study by employing multi-country GEM datasets to compare entrepreneurial ecosystem dynamics across transitional economies or across regions within countries. Such comparative analyses would help determine whether the paradoxical relationships observed in this study—particularly the negative association between perceived institutional support and entrepreneurial action—represent a broader pattern in state-driven entrepreneurial ecosystems or are unique to the Saudi institutional environment.

6. Conclusions

This study examined how individual capabilities, psychological factors, and entrepreneurial ecosystem components shape entrepreneurial action in Saudi Arabia. The findings demonstrate that entrepreneurial skills and networking abilities are the most powerful drivers of action, while fear of failure consistently constrains engagement. These results highlight the central role of human and social capital in fostering entrepreneurial behaviour that can be sustained over time.

Ecosystem-level factors exhibit mixed effects. The negative influence of perceived ease of doing business and media support suggests that institutional optimism and aspirational narratives do not automatically translate into entrepreneurial action, particularly when individuals lack readiness, confidence, or embedded support structures. The non-significant effects of market opportunities and entrepreneurial status further indicate that opportunity perception alone is insufficient in the absence of strong underlying capabilities.

Overall, this study contributes to entrepreneurial ecosystem research by demonstrating that sustainable entrepreneurial development in state-driven economies emerges not from uniform ecosystem expansion but from the alignment of institutional reforms with human capital development, social embeddedness, and psychological resilience. Strengthening these foundations is essential for translating ecosystem conditions into enduring entrepreneurial activity and achieving the long-term development objectives of Vision 2030.

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Abbreviations

The following abbreviations are used in this manuscript:

GEM	Global Entrepreneurship Monitor
APS	Adult Population Survey
OR	Odds Ratio

Appendix A

Table A1. Subgroup Characteristics (GEM APS Saudi Arabia).

Subgroup Category	Category (GEM Label)	Frequency	Percentage %
Gender	Male	2313	57.40%
	Female	1719.41	42.60%
Age Groups	18–24	637	15.80%
	25–34	1097	27.20%
	35–44	1226	30.40%
	45–54	726	18.00%
	55–64	346	8.6%
Education	No education	13	0.3%
	Secondary degree	1037	25.7%
	Post-secondary	2770	68.8%
	Graduate	209	5.2%
Employment Status	Employed full-time	2526	62.6%
	Part-time only	234	5.9%
	Retired, disabled	70	1.8%
	Homemaker	698	17.7%
	Student	201	5.1
	Not working	218	5.5

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