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Survival and Growth in Entrepreneurial Ecosystems: An Integration with Resource Dependence Theory and Entrepreneurial Orientation

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SURVIVAL AND GROWTH IN ENTREPRENEURIAL ECOSYSTEMS: AN INTEGRATION WITH RESOURCE DEPENDENCE THEORY AND ENTREPRENEURIAL ORIENTATION

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To Hien X. Chung, Leyna X. Nguyen, and Kelvin L. Nguyen:

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AE	Actor engagement
AVE	Average Variance Extracted
CR	Composite Reliability
EE	Entrepreneurial ecosystem
EO	Entrepreneurial orientation
GEM	Global Entrepreneurship Monitor
HOC	Higher Order Construct
HTMT	Heterotrait-Monotrait Ratio
LM	Linear Regression Model
LOC	Lower Order Construct
PLS-SEM	Partial Least Squares Structural Equation Modeling
RMSE	Root Mean Squared Error
SBA	Small Business Loans
VIF	Variance Inflation Factor

ABSTRACT

Sonny Lam Nguyen, Ph. D., University of South Alabama, May 2023. Survival and Growth in Entrepreneurial Ecosystems: An Integration with Resource Dependence Theory and Entrepreneurial Orientation. Chair of Committee: Joseph F. Hair, Ph.D.

The emergence of entrepreneurial systems has become a global phenomenon in the last decade (Cao & Shi, 2021). Entrepreneurial ecosystems are groups of interdependent actors and factors that formally and informally coalesce to connect, mediate, and enable entrepreneurship within a regional entrepreneurial environment (Mason & Brown, 2014; Spigel & Harrison, 2018; Stam, 2015). Researchers on entrepreneurial ecosystems have proposed different entrepreneurial ecosystem models comprising various components and elements. However, despite the popularity of the emergence of entrepreneurial ecosystems, there is a lack of measurement scales to respond to the high demand for empirical research, and the domain of entrepreneurial systems remains under-theorized. The limited research also has not explored the value of resource dependence theory and entrepreneurial behavior integration into entrepreneurial ecosystems**.** Therefore, this study fills in the above gaps by making four meaningful contributions. First, the study integrates resources dependency theory into the entrepreneurial ecosystems research domain. Second, the study illuminates the interaction between entrepreneurs and entrepreneurial ecosystems. Third, the entrepreneurial behavior approach of entrepreneurial orientation is explored as an enhancement to the entrepreneurial ecosystem. Fourth, this study will extend and improve current measurement scales for entrepreneurial ecosystems. Survey data will be collected from participants located in different regions of the United States. Partial least squares

structural equation modeling will be used to analyze the data and test the hypotheses. Given these considerations, the current investigation will likely have numerous implications for management research and practice.

Keywords: entrepreneurial ecosystem, resource dependency theory, entrepreneurial orientation.

CHAPTER I

INTRODUCTION

Research on entrepreneurial systems has attracted increasing attention from entrepreneurship researchers. The emergence of entrepreneurial systems has become a global phenomenon in the last decade (Cao & Shi, 2021), which offers entrepreneurship scholars opportunities to make contributions to the field. The conceptual definitions and dimensions of the entrepreneurial ecosystem are based on the historical evolution of the phenomena of industrial districts and regional clusters. An industrial district is a "socio-territorial entity characterized by the active presence of both a community of people and a population of firms in one naturally and historically bounded area including socio-territorial entities characterized by the active presence of both community of people and a population of firms in one naturally and historically bounded area" (Becattini, 1990). Moreover, clusters are defined as "a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities" (Porter, 1990).

The research stream of entrepreneurial ecosystems evolved in a new direction when Isenberg (2011) introduced an expanded conceptual framework of the entrepreneurship system. His framework describes entrepreneurial ecosystems as "the combinations of social, political, economic, and cultural elements within a region that support the development and growth of innovative startups and encourage nascent entrepreneurs and other actors to take the risks of starting, funding, and otherwise assisting high-risk ventures" (Isenberg, 2011).

In recent years, scholars have proposed new entrepreneurial ecosystem models based on Isenberg's framework. In this research, entrepreneurial ecosystems are defined as groups of interdependent actors and factors that formally and informally coalesce to connect, mediate, and enable entrepreneurship within the regional entrepreneurial environment (Mason & Brown, 2014; Spigel & Harrison, 2018; Stam, 2015).

A variety of entrepreneurial ecosystem models have been proposed. For example, the World Economic Forum model has eight components of entrepreneurship systems (Stam & Spigel, 2016). Their components include human capital, finance, services, talents, investors, customers, advisors, and governments. Guéneau et al. (2022) proposed that an entrepreneurial ecosystem is an environment that allows entrepreneurs to interact with other actors. Entrepreneurs should be in the center of an entrepreneurial ecosystem. In addition, Stam (2015) developed an integrative model for entrepreneurial ecosystems. The integrative model includes three components (outputs, resources endowments, and institutional arrangements) and ten elements (physical infrastructure, demand, intermediaries, talents, knowledge, leadership, finance, networks, culture, and formal institutions). In recent years, the Stam and Spigel (2016) framework has become increasingly popular because researchers were able to conduct empirical research based on their recommended framework.

Despite the emergence of entrepreneurial ecosystem models, the domain of the systems remains under-theorized (Cao & Shi, 2021). For example, theories from other disciplines like entrepreneurial behaviors have not been integrated into entrepreneurial ecosystems. In addition, relevant established measurement scales are not available to conduct impactful empirical research. Most researchers have used the Global

Entrepreneurship Monitor (GEM) scale, which focuses on the national level (Liguori et al., 2019), but no scales available to measure the components of entrepreneurial ecosystems at the regional levels (O'Connor et al., 2018). Moreover, existing research has not yet considered resource dependence theory as an element of entrepreneurial ecosystems (Cao & Shi, 2021).

This research addresses the above gaps by making the following contributions. First, the research integrates resources dependence theory into the entrepreneurial ecosystems research domain. Entrepreneurial ecosystems align with resource dependence theory to influence organizations and attract resources (Roundy & Bayer, 2019). Second, the research illuminates the interaction between firms and entrepreneurial ecosystems. When entrepreneurs participate actively in the ecosystem, they can more easily identify and access the needed resources. An entrepreneur cannot, therefore, gain all the potential benefits from being in the entrepreneurial ecosystem unless the entrepreneur actively engages in the ecosystem. Third, the entrepreneurial behavior approach of entrepreneurial orientation is explored as an enhancement to the entrepreneurial ecosystem. Entrepreneurial orientation reflects the organizational process, practice, and decision-making activities entrepreneurs use to act entrepreneurially (Gupta & Somers, 1996; Judge & Zeithaml, 1992; Stevenson, 1990). Fourth, the study will extend and improve current measurement scales for entrepreneurial ecosystems. Specifically, prior research focused on the measurement of entrepreneurial ecosystems at the national level and this research will extend it to the regional level. Therefore, this paper introduces an integrative conceptual model (see Figure 2) to focus on the links between entrepreneurial

orientation, actor engagement, entrepreneurial ecosystems, and firm resources, contributing to firm performance.

The paper is organized as follows. First, a literature review was conducted for firm resources, entrepreneurial ecosystems, and the integrative entrepreneurial ecosystem model. Second, a literature review was conducted for entrepreneurial orientation and actor engagement. Third, the conceptual framework's logic and hypotheses were presented. Fourth, methods and results were discussed. Fifth, discussions and conclusions were included.

CHAPTER II

LITERATURE REVIEW AND HYPOTHESES

This chapter consists of eight sections. The first section provides an overview of resource dependence theory.

2.1 Resource Dependence Theory

Very few firms have complete control of resources when they are started and must rely, therefore, on resources from their environments (Pfeffer & Salancik, 1978). Firms interact with their environments to access external resources, including tangible and intangible assets. The interactions are with other organizations in the social networks. As a result, when the environment changes, firms face uncertainty and must adjust to the environment. Pfeffer and Salancik (1978) proposed resource dependence theory as firms depending on external resources by connecting to networks or relationships in the environment. Moreover, regardless of their sizes, firms must rely on both internal and external resources to facilitate their products and services. Big firms have the financial capital to acquire or develop needed resources, but small firms and startups do not have sufficient resources, so they rely heavily on external resources (Pfeffer & Salancik, 1978). For example, entrepreneurial firms use local suppliers and services for their routine operations, such as technical support, legal advice, accounting, banks, venture capital, and marketing agencies. Gaining access to external resources becomes critical for firms to survive and compete in their environment.

Pfeffer and Salancik (1978) proposed three central themes related to the external control of organizations. The first theme is the importance of an organization's environment for hiring employees and managers and seeking alliances and mergers is based on the open system theory. In an open system, an organization is conceived as a system that interacts with its environment (Scott et al., 2007). A related concept, resource dependence theory, views organizations as actors engaging with social networks to access the needed resources, including information and financial and physical resources. The dependencies are reciprocal or indirect. The networks in the environment are essential, therefore, for organizations to access resources and improve performance (Pfeffer & Salancik, 1978).

The second theme involves organizational constraints and their situations in the environment (Pfeffer & Salancik, 1978). Organizations want to alter or negotiate their positions within those constraints. The strategies to overcome the limitations focus on the relationship between organizations, customers, suppliers, and other environmental actors, including governmental agencies. As a result, organizations can access resources and expand supply chains. When organizations try to change their situations in the environment, they become subject to new constraints. The dynamic interaction with social actors in the networks and the evolution of organizations in the environment continue to happen. As a result, the organizational decisions and structure will change over time (Pfeffer & Salancik, 1978).

The third theme is the power of intra-organizational and inter-organizational behaviors (Pfeffer & Salancik, 1978) which directly involve dependence and interdependence. According to resource dependence theory, some organizations have

more power than others because of their organizational positions. For example, hospitals provide healthcare to patients, but they rely on insurance companies and the government to pay for those services. In addition, vendors provide medical suppliers to hospitals. Therefore, each actor has more or less power depending on the interaction in the medical systems. Since internal dynamic power affects the resource dependencies of organizations, employees and managers could reduce environmental uncertainty, help organizations get more resources, and increase power to ensure organizational survival (Pfeffer & Salancik, 1978).

An essential dimension of the environment is the interconnectedness of actors. "The environment comprises the entire system of interconnected individuals and organizations related to one another and through the organization's transactions" (Pfeffer & Salancik, 1978). Actors adapt easier in a loosely joined system than in a tightly interconnected system because when the elements are interconnected, the actor faces difficulty changing the relationships. But, when the links are loose, an actor can adapt to the system quickly. Government action becomes an essential element in increasing the system's interconnectedness. For example, new regulations could encourage the actors in the system to comply with the new rules together (Pfeffer & Salancik, 1978).

Resource dependence theory creates an operationalized network and quantitatively measures external resources (Burt, 1983). A network is an interconnected group of actors in a local region committed to sustainable development to support and facilitate new entrepreneurial ventures (Cohen, 2006). Entrepreneurial ventures need a supportive network to survive because the network motivates collaboration and openness to new ideas, which is a vital process of entrepreneurship. Finally, entrepreneurs connect

to ecosystems to share resources, information, and knowledge (Spigel, 2020; Vedula & Kim, 2019).

2.2 Entrepreneurial Ecosystems and Resource Dependency Theory

Entrepreneurial ecosystems align with resource dependence theory to influence organizations and attract resources (Roundy & Bayer, 2019). By integrating entrepreneurial ecosystems, resource dependence theory emerges as a new approach to understanding how organizations gain and develop resources in their environment. Entrepreneurial ecosystems research focuses on multilevel analyses involving both the firm and the meta-level. Finally, entrepreneurial ecosystems and resource dependence theory interact through the organizational structure, which ultimately influences success, and survival (Roundy & Bayer, 2019).

Capital, both human and knowledge, are available through entrepreneurial ecosystems (Spigel, 2020). Obtaining the needed resources is critical for entrepreneurs for routine operations and innovations. Entrepreneurial ecosystems can also create an environment for firms to access resources. These resources include public policies and economic structures and depend on the willingness of actors to allow others to gain access (Spigel, 2020).

In summary, this research investigates two research questions related to entrepreneurial ecosystems. First, how do entrepreneurial ecosystems benefit entrepreneurs, and second, what entrepreneurial behaviors influence entrepreneurs to engage in entrepreneurial ecosystems?

2.3 Historical Evolution of Entrepreneurial Ecosystems

The conceptual definitions and dimensions of the entrepreneurial ecosystem are based on the historical evolution of the industrial district and regional cluster. An industrial district is a "socio-territorial entity characterized by the active presence of both a community of people and a population of firms in one naturally and historically bounded area including socio-territorial entities characterized by the active presence of both community of people and a population of firms in one naturally and historically bounded area" (Becattini, 1990). In addition, clusters are "a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities" (Porter, 1990). This definition of regional clusters is more comprehensive than others and includes three dimensions: the sectoral network, the geographical network, and the socio-economic network. Porter's approach has been criticized, however, because it downplays the role of individuals and human capital. In addition, Porter's strategy "pays little attention to the combination of local and distant connections" (Rocha & Audretsch, 2022).

In this research entrepreneurial ecosystems are defined as groups of interdependent actors and factors that formally and informally coalesce to connect, mediate, and enable entrepreneurship within the regional entrepreneurial environment (Mason & Brown, 2014; Spigel & Harrison, 2018; Stam, 2015). Thus, entrepreneurial ecosystems combine context, structure, agency, and complex multilevel systems (Rocha & Audretsch, 2022).

2.4 Entrepreneurial Ecosystem and an Integrative Model

Entrepreneurial ecosystems scholars have created different entrepreneurial ecosystem models comprised of various components and elements. Van de Ven (1993) developed an entrepreneurial ecosystem model that includes institutional arrangements, public resources, finance, market demand, R&D, manufacturing, marketing, and distribution channels. Feld (2020) focused on the interaction between actors in entrepreneurial ecosystems. Isenberg (2011) suggested entrepreneurial ecosystems should include "social, political, economic, and cultural elements within a region that support the development and growth of innovative startups and encourage nascent entrepreneurs and other actors to take the risks of starting, funding, and otherwise assisting high-risk ventures."

The World Economic Forum (Stam & Spigel, 2016) expanded Van de Ven's model by adding eight components to entrepreneurial systems. Their components focus on human capital, finance, and services. The model includes actors such as talents, investors, mentors, advisors, and entrepreneurs, as well as government, regulatory frameworks, domestic customers, and foreign customers. The Van de Ven framework of entrepreneurial ecosystems became the foundation for Stam (2015) and Spigel and Harrison (2018) to build an integrative model for entrepreneurial ecosystems. The integrative model includes three components and ten elements as shown in Figure1.

2.5 An Integrative Model of the Entrepreneurial Ecosystem

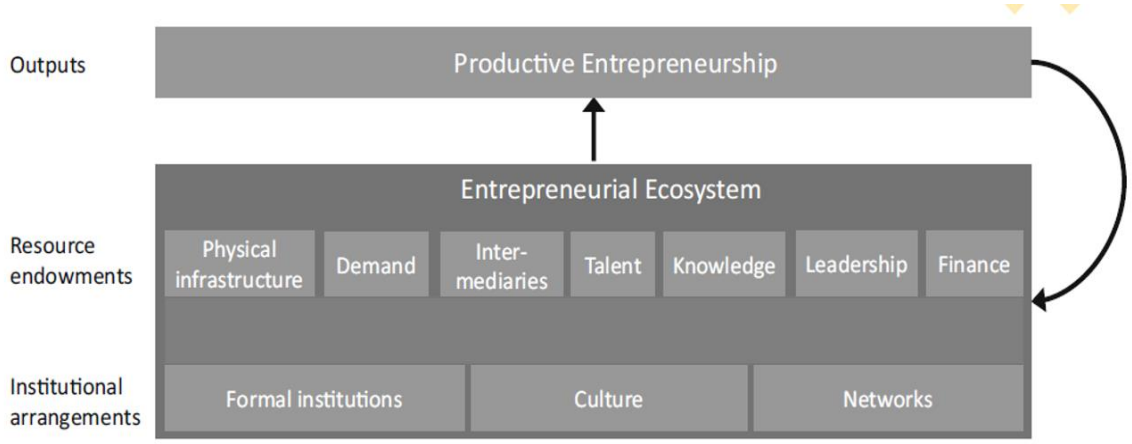

Figure 1. An Integrative Model of the Entrepreneurial Ecosystem.

The foundational component of institutional arrangements includes formal institutions, culture, and networks. Another component of entrepreneurial ecosystems includes resource endowments, which consists of physical infrastructure, demand, intermediaries, talents, knowledge, leadership, and finance. The third component is the output and innovations (Stam & Van de Ven, 2021) which leads to new value creation. The interdependence of those elements and their interaction is the critical success key for the ecosystem (Stam & Van de Ven, 2021).

Formal institutions are the game's rules that are a product of society (North, 1990, 1994). The quality and the efficiency of formal institutions affect entrepreneurship. Formal institutions include laws and regulations within countries (Stam & Van de Ven, 2021). Entrepreneurship culture, therefore, is a cultural belief about wealth that influences entrepreneurs to interact with their environment to obtain the resources they

need for innovations and growth. Cultural outlooks are the institutional force to produce economic outcomes (Spigel, 2020). Networks of entrepreneurs provide the flow of information, knowledge, labor, capital, and resources. Ultimately, Networks connect entrepreneurs with their environment, find opportunities, acquire finances, and purchase resources (Spigel, 2020).

Physical infrastructure includes the people living in the surrounding region. Physical infrastructure provides office space, roads, electricity, transportation, telecommunications, and potential accessibility, and is necessary to help firms grow. Demand is measured as a composite of disposable income per capita and market demand and represents the purchasing power and population size (Stam & Van De Ven, 2021). Leadership provides vision, guidance, and direction for an organization to accomplish its goals. Entrepreneurs are the best leaders in their ecosystem because they know what kinds of support they need. They also have skills, competence, and the ability to find resources. Talents include human capital and skilled workers, the essential elements in entrepreneurial ecosystems. New ventures need skilled workers to develop new products and drive innovations and are ultimately crucial to firm performance (Spigel, 2020).

Finance is another essential element for entrepreneurs to survive in the ecosystem. Finance includes all financial sources, including venture capital, bank loans, crowdfunding, government loans, and equity funding (Stam & Van de Ven, 2021). Knowledge involves investing in new knowledge and is also an essential source of entrepreneurial opportunities. New knowledge often leads to innovations, competitive advantage, and better performance. Intermediate services include support professionals, lawyers, accountants, consultants, bankers, advisors, mentors, and many more services to

help new ventures survive and grow. Finally, entrepreneurs benefit from supporting professionals in dealing with challenges and complex issues (Spigel, 2020).

To gain external resources, firms must interact with their social environments. Resource dependence theory assumes firms depend on external resources and obtain them by connecting to networks or relationships (Pfeffer & Salancik, 1978). The entrepreneurial ecosystem aligns with resource dependence theory since environmental elements influence organizations and attract resources (Roundy, 2020). Finally, entrepreneurial ecosystems focus on organizational resources, survival, and success (Roundy, 2020). As a result, having access to firm resources positively relates to firm performance. Therefore, I develop research hypotheses that link entrepreneurial ecosystem to firm resources, and resources to performance.

Hypothesis 1: Entrepreneurial ecosystems are positively related to firm resources.

Hypothesis 2: Firm resources are positively related to firm performance.

Prior research has used financial measures such as net income, revenue, cash flow, return on assets, returns on equity, return on revenue, earnings per share, and other financial indicators to measure firm performance. Clark (1999) suggested non-financial measures should also be included in assessing firm performance. Non-financial data includes market share, customer satisfaction, customer loyalty, brand equity, employee satisfaction, etc. (Li et al., 2009). Some scholars divided the measurement of firm performance into internal and external measures. Internal measures concern the interest factors inside the firm, and external measures concern the internal stakeholders outside the firm (Aggarwal & Gupta, 2006). Murphy et al. (1996) reviewed the measurement of firm performance in prior studies and concluded the dimensions of firm performance are

related to profit, growth, and efficiency. This study draws upon the measures from the work of Murphy et al. (1996) to assess firm performance. The linkage between entrepreneurial ecosystems and firm performance is strong when firms have access to external resources (Pfeffer & Salancik, 1978). Therefore, I developed the following research hypotheses.

Hypothesis 3: Entrepreneurial ecosystem is positively related to firm performance.

Hypothesis 4: Resources mediate the positive relationship between entrepreneurial ecosystem and firm performance.

2.6 Actor Engagement and Entrepreneurial Ecosystem

An entrepreneur needs to interact actively in the entrepreneurial ecosystem to access resources (Pfeffer & Salancik, 1978). A review of the literature shows there are two engagement research streams (Brodie et al., 2019). The first research stream is customer engagement. Customer engagement is "the level of a customer's physical, cognitive, and emotional presence in their relationship with a service organization" (Patterson et al., 2006). Moreover, customer engagement is a dyadic, interactive, network relationship between customers and firms. Research on customer engagement focuses on the emotion, cognition, and behavior dimensions (Brodie et al., 2011).

The second research stream is actor engagement. The conceptual domain of actor engagement is broader than and includes customer engagement. Vargo and Lusch (2014) defined "actors as humans or collections of humans, such as organizations, involved in the logic of human exchange systems, including economy and society." Actors can be

entrepreneurs, customers, government, non-profit organizations, universities, financial institutions, investors, and entrepreneurs (Vargo & Lusch, 2014). But actor engagement can also include nonhuman actors, such as machines or the combination of machines and humans. Finally, interactions among actors can be resource-integrated in various contexts (Brodie et al., 2019).

The central domain of engagement research is the notion of connectedness among actors in the ecosystem (Brodie et al., 2019). Actor engagement is the interplay between multiple levels such as micro, meso, and macro levels. For example, entrepreneurs (individual level) engage in the entrepreneurial ecosystem (meso level), working with customers, vendors, government agencies, investors, competitors, and consultants (actors). The interactions affect the collaborative economy by engaging policymakers to change rules and regulations (macro-level). The interrelation of multiple levels is essential to balancing the roles of actor engagement and understanding the engagement process (Brodie et al., 2019).

Despite the high demand for research on actor engagement, there is a lack of research on actor engagement at multiple levels in the ecosystem. An entrepreneur cannot, therefore, gain all the potential benefits from being in the entrepreneurial ecosystem unless the firm actively engages in the ecosystem. An entrepreneur is an actor who needs to connect and interact with other actors in the ecosystem. As a result, a positive relationship is hypothesized between actor engagement and the entrepreneurial ecosystem so that when entrepreneurs participate actively in the ecosystem, they can access the needed resources.

Hypothesis 5: Actor engagement is positively related to entrepreneurial ecosystems.

Hypothesis 6: Entrepreneurial ecosystems mediate the relationship between actor engagement and firm resources.

Entrepreneurs obtain resources and knowledge within an entrepreneurial ecosystem and need support from actors in the entrepreneurial ecosystem to improve performance. In addition, entrepreneurs share their services, products, processes, ideas, and technologies with other actors in the ecosystem, including finding potential customers, partners, and investors (Wurth et al., 2021). The interplay among actors in the ecosystem promotes business opportunities for entrepreneurial firms to take advantage of, and as a result improve their performance. For example, a professional firm meets other actors to share their services, increases potential client contacts, and accepts more clients, resulting in increasing its profit. In addition, entrepreneurs can attract investors, venture capitalists, and partners while engaging in the entrepreneurial ecosystem. The interactions between firms and the entrepreneurial ecosystem increase the possibility of improving performance. Therefore, a research hypothesis is developed linking firm engagement, entrepreneurial ecosystems, and performance.

Hypothesis 7: Entrepreneurial ecosystems mediate the positive relationship between actor engagement and firm performance.

2.7 Entrepreneurial Orientation and Entrepreneurial Ecosystem

Entrepreneurial orientation reflects the organizational process, practice, and decision-making activities firms use to act entrepreneurially (Gupta & Somers, 1996;

Judge & Zeithaml, 1992; Stevenson, 1990) Entrepreneurial orientation through the entrepreneurial process and environment is the primary factor contributing to performance. For example, Miller (1983) defined entrepreneurial orientation as entrepreneurial firms "engaging in the product market innovation, undertaking somewhat risky ventures, and are first to develop proactive innovations." Later, researchers developed the entrepreneurial orientation construct based on Miller's foundation. As a result, entrepreneurial orientation has become a popular construct in literature in the last decade.

Entrepreneurial orientation involves the intentions and actions of organizations to pursue new ventures in their environment. The dimensions of entrepreneurial orientation include innovativeness, risk-taking, proactiveness, competitive aggressiveness, and autonomy. Innovativeness is an essential dimension of entrepreneurship through demonstrating the firm is pursuing new opportunities (Gupta & Somers, 1996). Entrepreneurs search for innovative resources, changes, and opportunities to use for innovations. Innovativeness includes new goods and services, production processes, markets, technologies, supplies, and new industries (Schumpeter, 1942).

The next two dimensions of entrepreneurial orientation are risk-taking and proactiveness. Entrepreneurial firms rely on risk-taking strategies to overcome the lack of resource commitment, operational efficiency, social legitimacy, and organizational stability (Gupta & Somers, 1996). Different levels of risk-taking affect firm performance in the long run, but organizational performance is maximized at a moderate level of risk-taking (Begley & Boyd, 1987). In addition, Baird and Thomas (1985) identified three different risks: (a) venturing into the unknown, (b) committing a relatively large portion

of assets, and (c) borrowing heavily, all of which influence firm performance. Proactiveness refers to "the organizational intensity to identify and capitalize on market asymmetry" (Gupta & Somers, 1996). Entrepreneurs must introduce new products quicker than competitors, so a critical success factor is how quickly they respond to new products, technologies, and processes. Proactiveness is also associated with the willingness of a firm to react to its competitors. If the response is slow, firms will likely fall behind competitors in the marketplace (Gupta & Somers, 1996).

The last two dimensions of entrepreneurial orientation are competitive aggressiveness and autonomy. Competitive aggressiveness refers to a firm's tendency to challenge its competitors to gain a competitive advantage. Firms must evaluate the methods of their market competitors and invent new strategies or tactics to challenge them (Lumpkin & Dess, 1996). Autonomy refers to the independent actions and abilities of individuals or firms from beginning to end. Organizations can make resources available and initiate competitive decisions, and new venture initiation leads to new entries. A critical dimension of entrepreneurial orientation is, therefore, recognizing the freedom to act independently and taking action (Lumpkin & Dess, 1996).

In most instances, entrepreneurial firms have intentions and actions to pursue new ventures in their market environment. They rely on risk-taking strategies to overcome the lack of resource availability, commitment, and operational efficiency. They search for innovative resources, changes, and opportunities in their environment. Entrepreneurial firms challenge their competitors to gain a competitive advantage and remain free to make their own decisions regarding resource availability. Therefore, a research

hypothesis is developed to examine the relationship between entrepreneurial orientation and the entrepreneurial ecosystem.

Hypothesis 8: Entrepreneurial orientation are positively related to actor engagement.

Hypothesis 9: Actor engagement mediates the positive relationship between entrepreneurial orientation and entrepreneurial ecosystems.

2.8 Entrepreneurial Orientation and Firm Resources

As noted earlier, the dimensions of entrepreneurial orientation include autonomy, innovativeness, risk-taking, proactiveness, and competitive aggressiveness. Innovativeness shows that firms search for innovative resources, changes, and opportunities, including new goods and services, production processes, markets, technologies, supplies, and new industries (Schumpeter, 1942). Entrepreneurial firms rely on risk-taking strategies to overcome the lack of resource commitment, operational efficiency, social legitimacy, and organizational stability (Gupta & Somers, 1996). Proactiveness is vital to acquire resources and produce new products quicker than competitors. In addition, firms remain autonomous in their decisions regarding resource availability, competitive initiations, and new venture initiations that can lead to new entries (Lumpkin & Dess, 1996). Given the above relationships, the following research Hypotheses are developed.

Hypothesis 10: Entrepreneurs with higher entrepreneurial orientation are more likely to access firm resources.

Hypothesis 11: Resources mediate the relationship between entrepreneurial orientation and firm performance.

CHAPTER III

METHODS

3.1 Study Design

An online survey instrument was used on the Qualtrics platform and administered to a sample of the Prolific panel of entrepreneurs. Entrepreneurs from different regions of the United States responded to questionnaires designed to test the theoretical model shown in Figure 2. Respondents were self-identified in the screening process as entrepreneurs, represented different industries, were at least 25 years of age, and proficient in English. They were asked if they had previously started one or more businesses, how many years the business had operated, and what regions of the country they reside in. Attention checks were included in the questionnaire to maintain the integrity of the responses, and respondents failing the checks were removed from survey, as were outliers. This process facilitates high quality data collection.

To achieve the statistical power required to obtain meaningful solutions from the application of partial least squares structural equation modeling (PLS-SEM), recommended guidelines (Hair, Sarstedt, et al., 2022) were followed to obtain the appropriate sample size. After cleaning the data, I was left with 366 usable responses. This is well above the minimum recommended sample size of 80 for a statistical power of 80% with significance at the 5% level and a minimum R^2 of 0.25 (Hair, 2022). An alternative sample size approach, the inverse square root method (Kock & Hadaya, 2016), recommended a slightly smaller minimum sample size of 71 observations. The sample size was therefore sufficient for entrepreneurship research.

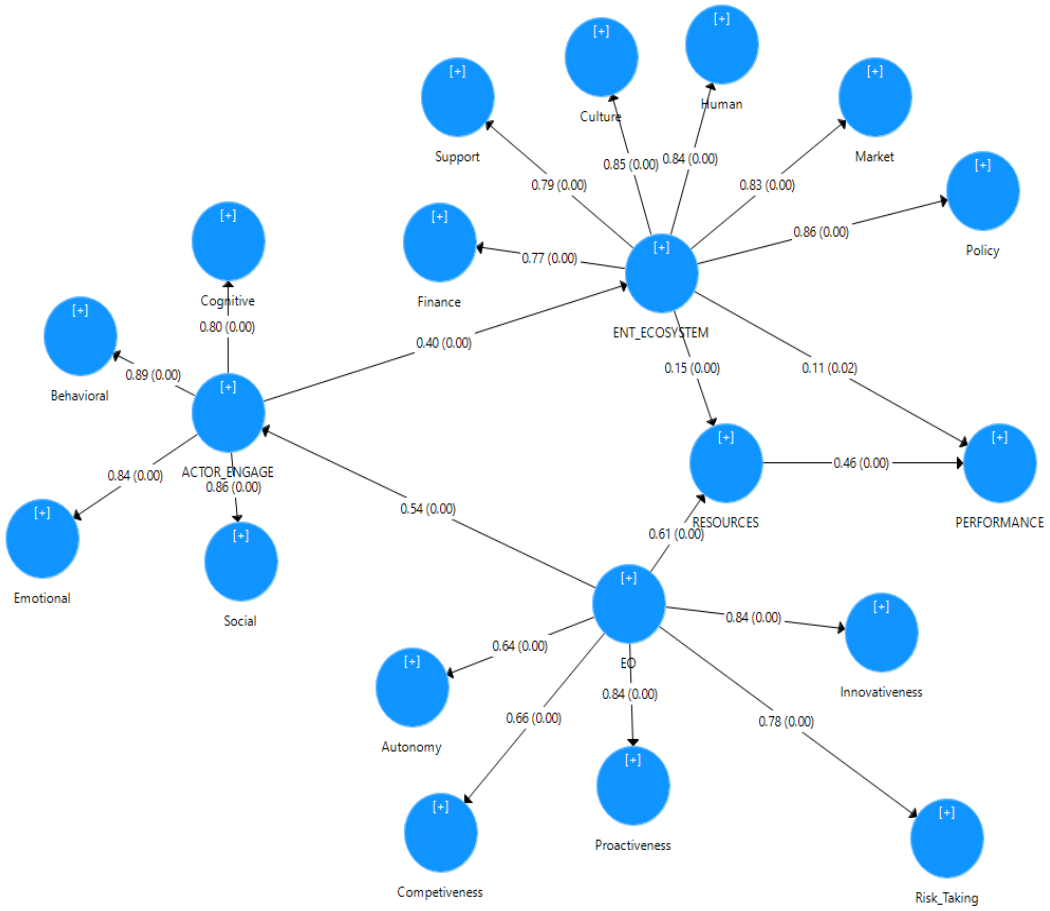

Figure 2. Results of Testing the Theoretical Model using PLS-SEM.

To mitigate the threat to the validity of the study's results due to the possibility of common method bias, the remedies recommended by Podsakoff et al. (2012) were followed. The study was designed to maximize the respondent's motivation to respond accurately and to minimize the difficulty of the survey. For example, the questionnaire was designed to be short, minimize redundancy, and facilitate respond. Moreover, the time for respondents to complete the questions was less than fifteen minutes, meeting the recommended time of fewer than thirty minutes. Finally, post hoc collinearity assessments were applied to assess the potential presence of common methods bias.

According to Kock and Lynn (2012), if variance inflation factors (VIF) for all latent variables are lower than 3.3, common method bias does not affect the model results. The results revealed VIFs for all latent variables were less than 3.3. In addition, an alternative assessment for common methods variance confirmed the lack of bias (Babin et al., 2016; Harman, 1976).

Table 1. *Variance Inflation Factor (VIF) Statistics for Predictor Variables*

	ACTOR_ENGAGE	ENT_ECOSYSTEM	RESOURCES	PERFORMANCE
ACTOR_ENGAGE			1	
ENT_ECOSYSTEM			1.214	1.193
EO	1		1.214	
RESOURCES				1.193
PERFORMANCE				0

To assess the questionnaire, an initial pilot test was conducted with a small group of participants (n = 30); no response issues were identified. For the final survey, a total of 393 responses were received. As noted previously, straight-liner responses, outliers, and respondents with substantial missing data were removed, resulting in a final sample size of 366. The final sample consisted of 159 (60%) males, 218 (43%) females, and 17 (7%) individuals who identified as other or preferred not to disclose. The mean age was 42 years, and 275 (70%) respondents were White, 40 (15%) were African American, 31 (7%) were Asian, and 20 (6%) were of other nationalities.

3.2 Measures

All measurement models were based on either a seven-point Likert scale ranging from 1 = *Strongly Disagree* to 7 = *Strongly Agree*, or an eleven-point Likert scale ranging from 0 = *Much Worse* to 10 = *Much Better*. Scale statements were adapted to ensure all relevant topics were assessed and the language was consistent with the contemporary meaning. In the following paragraphs, the established constructs used in this research are briefly described. The complete survey instrument is shown in Appendix B.

Entrepreneurial ecosystem (EE): A measure of entrepreneurial ecosystems was developed based on prior theoretical research (Isenberg, 2011). The theoretical framework included six domains: finance, policy, culture, support, human capital, and market. Several additional scale items were drawn from Liguori et al. (2019) and Audretsch et al. (2021). Measurement was based on a seven-point Likert scale ranging from 1 = *Strongly Disagree* to 7 = *Strongly Agree*.

Actor engagement (AE): A measure of respondent engagement was developed based on theoretical research (Brodie et al., 2019). The measure included three dimensions: cognitive, emotional, and behavioral. Additional scale items were adapted from (Hollebeek et al., 2014) as well as social interaction scale items from Zahra et al. (2007). Measurement was a seven-point Likert scale ranging from 1 = *Strongly Disagree* to 7 = *Strongly Agree*.

Entrepreneurial orientation (EO): The entrepreneurial orientation scale by Hult et al. (2004) was used to measure this concept. Scale items were evaluated using a seven-point Likert scale ranging from 1 = *Strongly Disagree* to 7 = *Strongly Agree*.

Firm resources: Scale items developed by Chadwick et al. (2015) and Gupta and Pandit (2012) were used to assess firm resources. The items included the strength, scope, and capability of the resources and were evaluated using a seven-point Likert scale ranging from 1 = *Strongly Disagree* to 7 = *Strongly Agree*.

Firm performance: Items adapted from Murphy et al. (1996) were used to measure firm performance. The questions included items for three dimensions: efficiency, growth, and profit, and were evaluated using a seven-point Likert scale ranging from 0 = *Strongly Disagree* to 10 = *Strongly Agree*.

Control variables: Control variables enable the researchers to evaluate the effect of one variable by controlling other variables that might influence the result if omitted (Hair, Sarstedt, et al., 2022). The following control variables were evaluated: gender, education, and years the company was in operation. Neither the gender of the entrepreneur, the year the company, nor education was established were significant on the model.

CHAPTER IV

RESULTS

To evaluate the measurement and structural models, partial least squares structural equation modeling (PLS-SEM) was applied. When conducting complex research with prediction as the primary statistical objective, PLS-SEM is the preferred approach (Hair, Hult, et al., 2022). The study explored the interactions between entrepreneurs, entrepreneurial ecosystems, resource dependency theory, actor engagement, and entrepreneurial orientation. The relationships were quite complex and therefore necessitated a sophisticated analytical method.

Entrepreneurial ecosystems, actor engagement, and entrepreneurial orientation were theorized higher-order constructs. PLS-SEM is the preferred statistical method when higher-order constructs are a component of the theoretical model (Hair, Sarstedt, & Ringle, 2019; Hair, Sarstedt, et al., 2022; Sarstedt et al., 2020). The method is also particularly useful when the sample consists of small, closely held companies (Binz-Astrachan et al., 2014). Finally, accurate assessment of measurement model and structural path relationships is a characteristic of PLS-SEM and valuable to the present work, in contrast to the sum scores or averages approach used in multiple regression (Sarstedt et al., 2020).

To test the theoretical model and explore the relationships, the Smart PLS 3.3 (Ringle et al., 2015) software was executed (Hair & Sarstedt, 2021). The measurement model included 100 indicators for nineteen constructs. First, the higher-order construct (HOC) of entrepreneurial ecosystems is measured by six lower-order constructs (LOCs)

of finance, support, human capital, culture, market, and policy, measured with thirty-three indicators. Second, the higher-order entrepreneurial orientation construct is measured by five lower-order constructs of innovativeness, risk-taking, proactiveness, competitive aggressiveness, and autonomy, measured with twenty-eight indicators. Third, the higher-order actor engagement construct is measured by four lower-order constructs of cognitive, behavioral, emotional, and social connection, consisting of twenty-four indicators. Fourth, firm resources are a lower-order construct, measured by six indicators. Lastly, firm performance is a lower-order construct, measured by nine indicators. These constructs were proposed as lower or higher order constructs based on their theoretical foundations and confirmed based on empirical evidence, as specified by Sarstedt et al. (2019).

4.1 Analysis

A detailed discussion of the results appears in the following sections. Table 2 includes descriptive statistics such as means, standard deviations, path coefficients, *t* statistics, and *p* values for all variables. According to Hair (2021), a path coefficient is significant at the 5% level if the *t* statistic is =/> 1.96 (2-tailed test). Path coefficients are between -1 and +1, with the coefficients closer to -1 representing strong negative relationships and those closest to +1 indicating strong positive relationships. The path coefficients indicate the changes in an endogenous construct's values associated with a standard deviation unit change in a specific predictor construct. All path coefficients of the model were positive and well above zero. In addition, *p* values for the relationships between independent variables and dependent variables met the recommended threshold

values of < .05. Thus, the results displayed in Table 2 indicate the relationships between Entrepreneurial Orientation, Actor Engagement, Entrepreneurial Ecosystems, Resources, and Performance were all significant and meaningful.

Table 2. *Means, Standard Deviations, and Correlations for Higher and Lower Order Constructs*

	Path Coefficient	Mean	Standard Deviation	T Statistics	P Values
ACTOR_ENGAGE -> ENT_ECOSYSTEM	0.404	0.402	0.048	8.476	0.000
ENT_ECOSYSTEM -> PERFORMANCE	0.113	0.116	0.051	2.202	0.028
ENT_ECOSYSTEM -> RESOURCES	0.146	0.147	0.046	3.162	0.002
EO -> ACTOR_ENGAGE	0.537	0.536	0.04	13.517	0.000
EO -> RESOURCES	0.611	0.614	0.041	14.834	0.000
RESOURCES -> PERFORMANCE	0.458	0.462	0.048	9.607	0.000

4.2 Measurement Model Evaluation – PLS-SEM

To assess our results, we follow the confirmatory composite analysis (CCA) process (Hair, Howard, & Nitzl, 2020). The proposed theoretical model contains three higher-order constructs (HOCs). The entrepreneurial ecosystem is an exogenous HOC specified as a type I with the lower order construct as reflective measures for the indicators and the higher order construct as reflective measures (Sarstedt et al., 2020). Moreover, entrepreneurial orientation is an exogenous HOC specified as a type I with the lower order construct as reflective measures for the indicators and the higher order construct as reflective measures (Sarstedt et al., 2020). Lastly, actor engagement is an exogenous HOC specified as a type I with the lower order construct as reflective measures for the indicators and the higher order construct as reflective measures (Sarstedt et al., 2020).

The repeated indicators approach was applied and initially assessed the reliability and validity of the reflective first-order indicators before evaluating the reflective second-order constructs (Sarstedt et al., 2020). This process involved the factor loadings, composite reliability (CR), average variance extracted (AVE), and the HTMT ratios to assess discriminant validity. The final step before examining the model's predictive validity is to ensure the nomological validity of the constructs.

The reflective measurement models were initially examined based on the size of the outer indicator loadings. The size of the outer loadings is called indicator reliability. Indicators are associated with constructs of the measurement model. The outer loadings should be statistically significant by meeting the rule of thumb of =/> .708 (Hair & Sarstedt, 2021). The standardized outer loading should be higher than a minimum of .50 and preferably =/> .708 (ideally). The outer loadings of the Behavioral, Cognitive, Emotional, and Social constructs ranged from 0.740 to 0.913. The outer loadings of the constructs of Culture, Finance, Human Capital, Market, Policy, and Support ranged from 0.744 to 0.905. The ECO_M5 had an indicator of .657, which is acceptable because it is above .50. The outer loadings of the constructs Autonomy, Competitiveness, Innovativeness, Proactiveness, and Risk-taking ranged from .744 to .896. The indicators of EO_PRO1 and EO_COMP4 had values of .583 and .653, which are acceptable because they are above .50. The outer loadings of the construct of performance had a range of .703 to .847. Only the indicator of PER7 had a value of .682, which is acceptable since it is above .50. The outer loadings of the resources construct ranged from .753 to .811, with one exception RS4 exhibiting a value of .554, which is acceptable (Hair, Hult, et al., 2022; see Appendix B).

Cronbach's alpha was applied to measure the internal consistency reliability based on the intercorrelations of observed indicator variables. A Cronbach's alpha =/> .70 is acceptable. The measurement models all have a Cronbach's alpha above .80, meeting the threshold of internal consistency liability. Moreover, a separate metric of reliability similar to Cronbach's alpha and all constructs met the minimum threshold (see Table 3).

Table 3. *Cronbach's Alpha and Composite Reliability*

Variable	Cronbach's Alpha	Composite Reliability
Actor_Engagement	0.950	0.955
Autonomy	0.902	0.927
Behavioral	0.868	0.905
Cognitive	0.882	0.912
Competitiveness	0.830	0.882
Culture	0.891	0.920
Ent_Ecosystem	0.961	0.964
Ent_Orientation	0.927	0.935
Emotional	0.935	0.95
Finance	0.800	0.862
Human	0.875	0.909
Innovativeness	0.878	0.911
Market	0.861	0.902
Performance	0.917	0.931
Policy	0.931	0.944
Proactiveness	0.835	0.880
Resources	0.820	0.871
Risk-taking	0.862	0.900
Social	0.897	0.920
Support	0.913	0.935

Convergent validity is a measure of a single unidimensional construct, assessed based on the indicators of specific reflective constructs sharing a high proportion of variance. The average variance extracted (AVE) metric was applied to measure construct

convergent validity. Based on recommended guidelines, AVE values higher than .50 explain more than half of the variance in the construct indicators, thus indicating construct convergent validity (Hair, Binz-Astrachan, et al., 2020). The AVE values of all measurement models are all higher than .50 (.53 to .74), meeting the recommended threshold. Please see Table 4.

Table 4. *AVE: Measure of Construct Convergent Validity*

Variable	Average Variance Extracted (AVE)
Autonomy	0.72
Behavioral	0.66
Cognitive	0.64
Competitiveness	0.61
Culture	0.70
EO	0.57
Emotional	0.79
Finance	0.56
Human	0.67
Innovativeness_	0.67
Market	0.65
Performance	0.60
Policy	0.71
Proactiveness	0.56
Resources	0.53
Risk-taking	0.64
Social	0.62
Support	0.74
AE	0.72
EE	0.68

To evaluate the statistical significance of the indicators, we executed the Smart PLS bootstrapping algorithm using 10,000 subsamples. All indicators were significant,

with *p*-values above 0.000. Thus, we confirmed the reliability, convergent validity, and significance of all constructs (Hair, Sarstedt, & Ringle, 2019).

To assess discriminant validity, measuring the distinctiveness of our constructs, we used the Heterotrait-Monotrait ratio of correlations (HTMT; Henseler et al., 2015). All the HTMT values – shown in Table 6 – were lower than the recommended guideline of 0.85, with the highest value at 0.77 for the lower-order constructs. Utilizing the bootstrapping algorithm with 10,000 subsamples revealed none of the values in the confidence intervals were equal to one. Having established discriminant validity, we next assessed nomological validity with other constructs in the nomological net (Hair, Binz-Astrachan, et al., 2020; Hair, Risher, et al., 2019). All results were consistent with the theoretical direction, expected size, and significance of the correlations, confirming nomological validity. Please see Table 5.

Table 5. *Heterotrait - Monotrait Ratios*

	Autonomy	Behavioral	Cognitive	Competiveness	Culture	Emotional	Finance	Human
Autonomy								
Behavioral	0.237							
Cognitive	0.212	0.775						
Competiveness	0.241	0.367	0.5					
Culture	0.241	0.367	0.261	0.228				
Emotional	0.323	0.774	0.546	0.252	0.326			
Finance	0.344	0.272	0.173	0.225	0.725	0.292		
Human	0.197	0.437	0.248	0.24	0.696	0.28	0.718	
Innovativeness_	0.508	0.45	0.406	0.411	0.248	0.369	0.307	0.312
Market	0.248	0.349	0.227	0.301	0.813	0.342	0.659	0.764
PERFORMANCE	0.288	0.387	0.373	0.382	0.285	0.343	0.298	0.343
Policy	0.232	0.385	0.253	0.243	0.718	0.306	0.663	0.724
Proactiveness	0.406	0.511	0.515	0.679	0.326	0.378	0.412	0.414
RESOURCES	0.635	0.564	0.531	0.476	0.358	0.475	0.431	0.44
Risk_Taking	0.449	0.383	0.365	0.5	0.369	0.341	0.372	0.305
Social	0.277	0.766	0.628	0.426	0.421	0.69	0.351	0.397
Support	0.307	0.294	0.143	0.167	0.669	0.275	0.697	0.698

	Innovativeness	Market	Performance	Policy	Proactiveness	Resources	Risk_Taking	Social	Support
Market	0.36								
PERFORMANCE	0.395	0.22							
Policy	0.263	0.712	0.25						
Proactiveness	0.746	0.404	0.571	0.369					
RESOURCES	0.647	0.379	0.57	0.366	0.714				
Risk_Taking	0.659	0.452	0.248	0.317	0.598	0.452			
Social	0.467	0.366	0.554	0.403	0.596	0.601	0.384		
Support	0.307	0.591	0.243	0.621	0.319	0.371	0.276	0.261	

4.3 Structural Model Evaluation – PLS-SEM

The structural model relationships were examined next. The VIF values for the predictive constructs were examined to ensure multicollinearity does not meaningfully affect the structural model estimates. If VIF values indicate substantial collinearity, structural model assessments are necessary, such as creating higher order constructs to reduce collinearity issues (Hair, Satstedt, et al., 2022). The VIF values for all predictive

constructs (Entrepreneurial Ecosystem, Actor Engagement, Entrepreneurial Orientation, Resources, and Performance) were below 3.3, thus indicating no issues with multicollinearity. Please see Table 6.

Table 6. *Collinearity Statistics (VIF)*

	ACTOR_ENGAGE	ENT_ECOSYSTEM	RESOURCES	PERFORMANCE
ACTOR_ENGAGE		1		
ENT_ECOSYSTEM			1.214	1.193
EO	1		1.214	
RESOURCES				1.193
PERFORMANCE				0

The explanatory power of a model relates to its ability to fit the data at hand by quantifying the strength of association indicated by the R^2 for the PLS path model. The coefficient of determination (R^2) value was assessed since it represents the in-sample predictive power of the model (Hair & Sarstedt, 2021; Manley et al., 2021). The R^2 metric ranges from 0 to 1 with higher values indicating higher levels of explanatory power. The R^2 values range from .222 to .469, which are considered small to moderate explanatory levels. Please see Table 7.

Table 7. *R Square (R^2)*

Variable	R^2
ACTOR_ENGAGE	0.289
ENT_ECOSYSTEM	0.222
PERFORMANCE	0.264
RESOURCES	0.469

The f^2 metric is used to assess the effect size of a driver construct on a specific dependent construct. Guidelines for assessing effect sizes are values of 0.02, 0.15, and 0.35, respectively, representing small, medium, and large effects of an exogenous latent variable on an endogenous latent variable (Hair, Risher, et al., 2019). All proposed relationships meet minimum effect size guidelines. For example, f^2 for AE → EE is 0.195, EO → AE is 0.405, EE → Resources → Performance is .238, and EE → Performance is 0.015. Please see Table 8.

Table 8. *F Square (f^2)*

	ACTOR_ENGAGE	ENT_ECOSYSTEM	PERFORMANCE	RESOURCES
ACTOR_ENGAGE		0.195		
ENT_ECOSYSTEM			0.015	0.033
ENT_ORIENTATION	0.405			0.579
PERFORMANCE				
RESOURCES			0.238	

Entrepreneurship researchers use the R^2 statistic to measure the in-sample explanatory predictive power. The purpose of in-sample prediction is a measure of the ability of sample to predict dependent variable values for the observation in the same sample. Researchers believe that R^2 is a good measure of the ability to explain dependent variable observation included in the initial analysis sample. However, R^2 is not an accurate measure of out-of-sample prediction (hold out sample). Nitzl and Chin (2017) recommended entrepreneurship researchers use out-of-sample predictive power to analyze model predictions and estimate the model parameters (Hair, Risher, et al., 2019).

Moreover, social sciences scholars have proposed the holdout sample approach to assess out-of-sample predictive power (Manley et al., 2021).

PLSpredict has been proposed as a procedure that uses a holdout sample approach to assess item-level predictions of the ultimate dependent construct. Thus, PLSpredict metrics evaluate the out-of-sample predictive power of the theoretical model. In an initial evaluation of out-of-sample prediction was to review Q^2 metric for endogenous constructs resulting from the blindfolding approach. The Q^2 values are greater than zero suggests that the theoretical model has predictive power (Hair, Sarstedt, et al., 2022). Thus, all indicators have the Q^2 predict values ranging from .094 to 0.128, which are larger than zero, suggesting that the PLS path model has moderate predictive relevance (Hair, Sarstedt, et al., 2022).

Researchers assess the PLSpredict error results by examining the prediction errors for the ultimate endogenous construct(s) of the theoretical model. They initially examined the distribution of the RMSE error statistic. One of the predictive metrics is the root mean squared error (RMSE). RMSE metric is the square root of the average of the squared difference between the predictions and observations (Hair, Sarstedt, et al., 2022). RMSE metric squares the errors before averaging, and thus is very useful when researchers want to avoid errors (Manley et al., 2021). This process compares the RMSE values with the naïve benchmark LM (Manley et al., 2021).

1. If the PLS-SEM prediction errors for RMSE for all indicators are higher compared to the naïve LM benchmark, the model does not have predictive power.

2. If a majority of the prediction errors (RMSE) of the dependent construct indicators for PLS-SEM are higher compared to the naïve LM benchmark, the model has low predictive power.
3. If a minority (or the same number) of the prediction errors of the indicators for PLS-SEM are higher compared to the naïve LM benchmark, the model has medium predictive power.
4. If none of the prediction errors of the indicators for RMSE for PLS-SEM are higher compared to the naïve LM benchmark, the model has high predictive power.

The RMSE values and the naïve LM benchmark of the endogenous construct of performance are shown on Table 9. The RMSE prediction errors of the indicators of PER1, PER2, and PER3 are higher than the prediction errors of the naïve LM benchmark. Other RMSE prediction errors of the indicators of PER4, PER5, PER6, PER7, PER8, and PER9 are lower than the prediction errors of the naïve LM benchmark. Therefore, two-thirds (66%) of the prediction errors of the indicators for PLS-SEM are lowered compared to the naïve LM benchmark, so the model has medium predictive power (Manley et al., 2021).

Table 9. *RMSE Values and Naïve LM Benchmark*

Indicators	RMSE Values	Naïve LM Benchmark	Difference
PER1	1.720	1.666	0.054
PER2	1.727	1.642	0.085
PER3	1.832	1.785	0.047
PER4	1.863	1.905	-0.042
PER5	1.598	1.630	-0.032
PER6	1.774	1.825	-0.051
PER7	1.611	1.617	-0.006
PER8	1.813	1.856	-0.043
PER9	1.716	1.761	-0.045

4.4 Direct Relationships

For the entire model, the hypothesized direct relationships were evaluated first (see Table 10). The three direct relationships from the exogenous construct entrepreneurial ecosystem were assessed. The three relationships exhibit positive, statistically significant relationships between entrepreneurial ecosystems and resources (H1), entrepreneurial ecosystems and performance (H2), and resources and performance (H3). The results indicated, therefore, three positive and statistically significant ($p < .05$) relationships supporting H1, H2, and H3.

Next, the three other direct relationships were analyzed: from the exogenous construct of actor engagement to entrepreneurial ecosystem (H5), entrepreneurial orientation to actor engagement (H8), and entrepreneurial orientation to resources (H10). The results indicate all three relationships are positive and significant ($p < .05$), supporting H5, H8, and H10. Table 10 shows the analysis results of the six hypothesized direct relationships.

Table 10. *Path Coefficients, T Statistics, and P Values for Direct Effects of the Hypothesized Relationships*

		Path Coefficient	*T* Statistics	*P* Values	Significant
H1	ENT_ECOSYSTEM → RESOURCES	0.146	3.267	0.001	Yes
H2	RESOURCES → PERFORMANCE	0.458	10.579	0.000	Yes
H3	ENT_ECOSYSTEM → PERFORMANCE	0.113	2.356	0.019	Yes
H5	ACTOR_ENGAGE → ENT_ECOSYSTEM	0.250	4.544	0.000	Yes
H8	EO → ACTOR_ENGAGE	0.537	12.469	0.000	Yes
H10	EO → RESOURCES	0.611	14.084	0.000	Yes

4.5 Indirect Relationships – Mediation

Next, the indirect mediated effects were assessed in terms of the coefficient sizes and significance levels via 10,000 samples with bootstrapping. This process facilitates obtaining solutions for more complex models with smaller sample sizes by employing randomly drawn observations to create multiple subsamples of the original data to analyze the model and calculate statistical relationship significance (Hair et al., 2017; Hair, Sarstedt, et al., 2022; Hair, Sarstedt, & Ringle, 2019). This method also facilitates the assessment of complex direct and indirect relationships. Mediation examines the progression in the relationship between the exogenous variable/construct to an endogenous variable and then to the ultimate endogenous outcome variable (Hair et al., 2017).

The evaluation of mediation followed the mediation analysis procedure recommended by Hair, Sarstedt, et al. (2022) and Sarstedt et al. (2020). The significance of the direct and indirect effects was tested by analyzing p values, effect sizes and confidence intervals. As shown on Table 11, 95%, the confidence intervals of indirect

effects did not include zero, thus, the indirect effects are significant. The next step of the mediation analysis is to analyze the statistical significance of direct effect sizes as shown in Table 12. The relationships of entrepreneurial ecosystem and performance, entrepreneurial ecosystem and resources, resources and performance, actor engagement and entrepreneurial ecosystem, entrepreneurial orientation and resources, and entrepreneurial orientation and actor engagement are strong based on direct effects ranging from 0.113 to 0.537, and significance ($p < 0.05$). Lastly, the mediation analysis focuses on testing the significance of the total effects. Table 13 shows that the confidence intervals of the total indirect effects did not include zero, thus, the total indirect effects were significant. Moreover, the total indirect effects were from moderate to strong (.036 to 0.356), and significant ($p < 0.05$).

The mediation findings provide empirical support for the role of resources partially mediating the relationship between entrepreneurial ecosystem and performance (H4), entrepreneurial ecosystem mediating the relationship between actor engagement and resources (H6), entrepreneurial ecosystem mediating the relationship between actor engagement and performance (H7), actor engagement mediating the relationship between entrepreneurial orientation entrepreneurial ecosystem (H9), and resources mediating the relationship between entrepreneurial ecosystem and performance (H11). Overall, these findings confirm hypotheses: H4, H6, H7, H9, and H11.

Table 11. *Indirect Effect, 95% Confidence Interval of Direct Effect, and Significance (p < .05)*

Hypothesis Number	Mediation	Total Indirect Effect	95% Confidence Interval of the Direct Effect	Significance ($p < .05$)
H4	ENT_ECOSYSTEM → RESOURCES → PERFORMANCE	0.067	(0.029-0.107)	Yes
H6	ACTOR_ENGAGE → ENT_ECOSYSTEM → RESOURCES	0.059	(0.026-0.103)	Yes
H7	ACTOR_ENGAGE → ENT_ECOSYSTEM → PERFORMANCE	0.046	(0.008-0.088)	Yes
H9	EO → ACTOR_ENGAGE → ENT_ECOSYSTEM	0.134	(0.079-0.192)	Yes
H11	EO → RESOURCES → PERFORMANCE	0.279	(0.211-0.352)	Yes

Table 12. *Direct Effect, 95% Confidence Interval of Direct Effect, and Significance (p < .05)*

Hypothesis Number	Hypotheses	Direct Effect	95% Confidence Interval of the Direct Effect	Significance (p < .05)
H1	ENT_ECOSYSTEM → RESOURCES	0.146	(0.058-0235)	Yes
H2	RESOURCES → PERFORMANCE	0.458	(0.365-.551)	Yes
H3	ENT_ECOSYSTEM → PERFORMANCE	0.113	(0.022-0.208)	Yes
H5	ACTOR_ENGAGE → ENT_ECOSYSTEM	0.404	(0.320-0.500)	Yes
H8	EO → ACTOR_ENGAGE	0.537	(0.451-0.619)	Yes
H10	EO → RESOURCES	0.611	(0.531-0.693)	Yes

Table 13. *Total Direct Effect, 95% Confidence Interval of Total Indirect Effect, and Significance (p < .05)*

Multiple Mediation	Total Indirect Effect	95% Confidence Interval of the Direct Effect	Significance (p < .05)
ACTOR_ENGAGE → PERFORMANCE	0.045	(0.015-0.087)	Yes
ACTOR_ENGAGE → RESOURCES	0.036	(0.012-0.73)	Yes
ENT_ECOSYSTEM → PERFORMANCE	0.067	(0.029-0.122)	Yes
EO → ENT_ECOSYSTEM	0.134	(0.074-0.199)	Yes
EO → PERFORMANCE	0.355	(0.295-.0422)	Yes
EO → RESOURCES	0.061	(0.026-0.105)	Yes

CHAPTER V

DISCUSSION AND CONCLUSIONS

5.1 Summary of Results

The primary objective of this research was to analyze the interactions between entrepreneurs with entrepreneurial ecosystems. The notion of connectedness among actors is the center to the entrepreneurial ecosystem (Brodie et al., 2019). Actor engagement is the interplay among actors at multiple levels such as micro, meso, and macro levels. An entrepreneur cannot, therefore, gain all the potential benefits from being in the entrepreneurial ecosystem unless the entrepreneur actively engages in the entrepreneurial ecosystem.

A second objective of this research was to integrate resources dependence theory into the entrepreneurial ecosystems research domain. Entrepreneurial ecosystems align with resource dependence theory to influence organizations and attract resources (Roundy, 2020). When entrepreneurs participate actively in the ecosystem, they can more easily identify and access the needed resources. Entrepreneurs obtain resources and knowledge within an entrepreneurial ecosystem and need support from actors in the entrepreneurial ecosystem to improve performance (Pfeffer & Salancik, 1978). The interplay among actors in the entrepreneurial ecosystem promotes business opportunities for entrepreneurial firms to take advantage of, and as a result improve their performance.

The third objective of this study was to emphasize the antecedents of actor engagement and develop an understanding of why and how some entrepreneurs engage in the entrepreneurial ecosystem more than others. To do so the research focused on the

relationships between entrepreneurial orientation and actor engagement. Entrepreneurial orientation reflects the organizational process, practice, and decision-making activities entrepreneurs use to act entrepreneurially (Gupta & Somers, 1996; Judge & Zeithaml, 1992; Stevenson, 1990). Entrepreneurs have intentions and actions to pursue new ventures in their market environment. They rely on risk-taking strategies to overcome the lack of resource availability, commitment, and operational efficiency. Finally, they search for innovative resources, changes, and opportunities in their environment. If executed successfully, these entrepreneurs thrive.

Lastly, the study extended and improved current measurement scales for entrepreneurial ecosystems. Specifically, prior research focused only on the measurement of entrepreneurial ecosystems at the national level. The current research developed and confirmed a new scale to measure entrepreneurial ecosystems at the regional level.

Based on those objectives, eleven proposed hypotheses (H1 to H11) were evaluated using PLS-SEM to test the theoretical model relationships shown in Figure 2. The proposed relationships include direct and indirect relationships between the constructs of actor engagement, entrepreneurial ecosystems, entrepreneurial orientation, resources, and performance. The results showed the direct relationships between entrepreneurial ecosystems and resources (H1), entrepreneurial ecosystems and performance (H3), and resources and performance (H2) were positive and significant ($p < 0.5$). In addition, the direct relationships between actor engagement and entrepreneurial ecosystem (H5), entrepreneurial orientation and actor engagement (H8), and entrepreneurial orientation and resources (H10) were positive and significant ($p < 0.5$).

Moreover, the results validated that the indirect relationships were positive and significant. Resources mediated the relationship between entrepreneurial ecosystem and performance (H4), entrepreneurial ecosystem mediated the relationship between actor engagement and resources (H6), entrepreneurial ecosystem mediated the relationship between actor engagement and performance (H7), actor engagement mediated the relationship between entrepreneurial orientation and entrepreneurial ecosystem (H9), and resources mediated the relationship between entrepreneurial ecosystem and performance (H11). These statistical findings supported the mediated hypotheses H4, H6, H7, H9, and H11.

In summary, these results showed evidence to support the relationships in the theoretical model. The significance of these relationships needs further studies and expansion. The next sections will discuss the theoretical implications, limitations, and future directions.

5.2 Theoretical Contributions

This research made four quite meaningful theoretical contributions. First, the research explored the interaction between entrepreneurs with entrepreneurial ecosystems. The focus was on the engagement among actors between micro level and meso level. Through this study, the interactions between entrepreneurs and entrepreneurial ecosystems were illuminated. Second, the research integrated the theoretical foundation of entrepreneurial ecosystems with resource dependency theory. The results confirm entrepreneurial ecosystems aligned with resource dependence theory to influence organizations and attract resources. When entrepreneurs engage actively in the

entrepreneurial ecosystem, they can access the needed resources. Third, the theoretical concepts of entrepreneurial behavior and entrepreneurial orientation were assessed as components of the entrepreneurial ecosystem and proposed as antecedents of actor engagement. More specifically, this element examined how entrepreneurial orientation influences entrepreneurs to engage in entrepreneurial systems and gain resources, ultimately resulting in improved performance. Fourth, the research developed findings regarding components of entrepreneurial ecosystems at the regional level. Prior research focused on the measurement of entrepreneurial ecosystems at the national level. But the measurement of the entrepreneurial ecosystem at the meso-level has not been examined.

5.3 Practical Implications

Research on entrepreneurial ecosystems is quite a limited research stream and additional knowledge is quite meaningful to practitioners, policymakers, and researchers across the globe. From the practitioner's perspective, entrepreneurs become aware of the benefits of engaging in entrepreneurial ecosystems to gain resources, knowledge, technology, information, and networking. Entrepreneurs benefit from learning how entrepreneurial ecosystems can improve firm performance as well as how to utilize entrepreneurial ecosystems. From the policymaker's perspective, they need to know how to create effective policies and regulations to promote entrepreneurship in their regions. Increasing entrepreneurship activities create more job opportunities for regional residents, and as a result, more tax revenues can be collected. Finally, scholars identify opportunities to develop and explore a new entrepreneurship research stream can help practitioners to manage their businesses more effectively.

5.4 Limitations and Future Research

When researchers view entrepreneurial ecosystems from the lens of entrepreneurship, they exhibit a narrow view of the complexity of ecosystems. Blind spots are often present since entrepreneurial ecosystems do not consider global ecosystems, innovation ecosystems, and digital ecosystems. For example, when entrepreneurs are not able to find resources in their regions, they reach outside regions or global regions to acquire resources. As a result, entrepreneurs can establish connections with other ecosystems and engage with knowledgeable actors in different ecosystems. These connections will, therefore, facilitate the expansion of their entrepreneurial ecosystems beyond the regional boundaries. Moreover, future research should examine the connections between entrepreneurial ecosystems and other ecosystems, which will enhance our understanding of the relationships between different ecosystems.

Prior research on entrepreneurial ecosystems focuses primarily on the structures and domains of the ecosystems and much less on the engagement of actors. Thus, future research should focus on multi-actor engagement because further understanding of how actors interact with each other in the same domain or different domains will facilitate entrepreneurial activities in the regional ecosystems (Jacobides et al., 2018). For example, bankers in the support domain will be able to work with accountants and financial advisors to help entrepreneurs obtain financial support. Moreover, bankers also interact with the government to become brokers for government programs to provide funding, such as Small Business Loans (SBA) and disaster loans to entrepreneurs. Another example is universities are often essential actors in the human capital domain in entrepreneurial systems. Universities often share new knowledge to enhance

commercialization in communities, regions, and states, thereby facilitating entrepreneurial activities and economic growth. These relationships are not always established, however, because there are barriers, such as knowledge filters between new knowledge and commercialization. When present, these filters impede the flow of knowledge from universities and other resources to commercialization (Audretsch, 2014). Future research should focus, therefore, on spillover mechanisms to facilitate regional entrepreneurial activities.

5.5 Overall Conclusions

Entrepreneurial firms need to develop internal resources and access external resources as well to achieve superior performance and gain competitive advantages. Gaining and maintaining resources are critical success factors for firm survival. Entrepreneurial ecosystems can attract additional resources and create an accessible environment for firms, but entrepreneurs need to actively engage with other actors in the entrepreneurial ecosystem. In addition, entrepreneurial orientation leads to the intentions and actions of organizations and entrepreneurs to pursue new ventures in their environment. But to be successful, entrepreneurial orientation must reflect organizational processes, practices, and decision-making activities to act entrepreneurially.

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APPENDICES

Appendix A

Measures - Codebook for Data Collection

SURVEY

Items on a 1 to 7 scale with anchors of Strongly Disagree (1) to Strongly Agree (7).

Entrepreneurial Ecosystems		
Finance	ECO_F1	My community has a sufficient number of banks to serve entrepreneurial businesses.
	ECO_F 2	There are investors other than banks in my community willing to financially support. entrepreneurs (e.g., angel investors, venture capitalists, partner financing, crowdfunding, colleagues, friends, and families).
	ECO_F 3	Banks in the local community offer business loans to entrepreneurs who qualify.
	ECO_F 4	Banks in the local community offer business loans to entrepreneurs who qualify.
	ECO_F 5	Banks in the local community offer various electronic payment options to customers (Zelle, Vemo, wire transfer, e-checks, and others).
	ECO_F 6	My community is not very good for entrepreneurial businesses.
Supports	ECO_S1	My community has the social infrastructure necessary to support starting and running most businesses (e.g., schools, social care, healthcare).
	ECO_S2	My community has the technical infrastructure necessary to support starting and running most businesses (e.g., roads, water supply, sewage system).
	ECO_S3	My community has the order and security necessary to support starting and running most businesses (e.g., fire protection, mass events security, civil security).
	ECO_S4	My community has the spatial and ecological order necessary to support starting and running most businesses (e.g., air, water, land, building, and waste management).
	ECO_S5	My community has the professional services necessary to support starting and running most businesses (e.g., lawyers, consultants, advisors, and accountants).

Appendix A cont.

Culture	ECO_C1	The entrepreneurship culture and orientation in my community are very strong.
	ECO_C2	I know one entrepreneur who started a business in the past.
	ECO_C3	The social values and culture of the community emphasize creativity and innovativeness.
	ECO_C4	The social values and culture of the community encourage entrepreneurial risk-taking.
	ECO_C5	The social values and culture of the community emphasize self-sufficiency, autonomy, and personal initiative.
	ECO_C6	The social values and culture of my region appreciate new business formation over jobs.
	ECO_C7	The culture of my community evaluates failure harshly.
Human Capital	ECO_H1	Local educational institutions offer a variety of business courses.
	ECO_H2	Training programs for new business are available in my local community.
	ECO_H3	There is a sufficient number of business schools (universities, community colleges, trade schools) in my community.
	ECO_H4	I have plenty of opportunities to work with people in different industries.
	ECO_H5	I have access to mentors who provide advice to my business.
Market	ECO_M1	The diversity in my community provides a great test market for many other locations.
	ECO_M2	My community networks could help me distribute new products/services across a variety of new markets.
	ECO_M3	My community's multinational diversity helps keep me connect to the global economy.
	ECO_M4	In my region, people are well informed, and have many solutions for their problems through other support businesses.
	ECO_M5	In my region, people are most concerned with the quality of services/products.
	ECO_M6	My community is an appropriate test market because it is similar to many other communities.

Appendix A cont.

Policy	ECO_P1	The local government promotes an entrepreneurship-friendly environment.
	ECO_P2	Local governments have friendly policies to support entrepreneurs when they apply for business permits or licenses.
	ECO_P3	Local governments distribute business newsletters and/or provide programs to support local businesses.
	ECO_P4	Local governments understand the importance of entrepreneurship for job creation and economic growth in my region.
	ECO_P5	I have easy access to information from the local government (city, county, state).
	ECO_P6	An adequate number of government entrepreneurship support programs are available in my community.
	ECO_P7	ECO_P7 The process for obtaining business licenses and permits is straightforward.

Items on a 1 to 7 scale with anchors of Strongly Disagree (1) to Strongly Agree (7).

Entrepreneurial Orientation		
Innovativeness	EO_INV1	I actively introduce improvements and innovations for my business.
	EO_INV2	I am creative in my methods of operation.
	EO_INV3	I seek out new ways to do things.
	EO_INV4	I commit to investing in continuous improvement.
	EO_INV5	I make changes in products or services to meet changing customer needs.
Risk-Taking	EO_RIS1	The term "risk taker" is considered a positive attribute for people in my business.
	EO_RIS2	People in my business are encouraged to take calculated risks with new ideas.
	EO_RIS3	My business emphasizes both exploration and experimentation in seeking out opportunities.
	EO_RIS4	My business adopts a wide range of strategies necessary to achieve the firm's objectives.

Appendix A cont.

	EO_RIS5	My business commits its resources in order to grow.
Proactiveness	EO_PRO1	When I initiate actions in my business (e.g., against competitors, in projects, and when working with others), other organizations respond.
	EO_PRO1	My firm monitors the needs of customers.
	EO_PRO1	I excel at identifying business opportunities.
	EO_PRO1	My firm pays attention to technological trends.
	EO_PRO1	In my business I always try to take the initiative in every situation (e.g., against competitors, in projects, and when working with others).
	EO_PRO1	My firm implements the latest technology to improve operations.
	EO_PRO1	My firm often follows its competitors' lead.
Competitive Aggressiveness	EO_COM1	My firm is intensely competitive.
	EO_COM2	In general, our business takes a bold or aggressive approach when competing.
	EO_COM3	My firm responds to and out-maneuvers the competition as best we can.
	EO_COM4	I copy the business practices or techniques of successful competitors to enhance a competitive position.
	EO_COM5	EO_COM5 I am willing to adopt a price-cutting strategy to enhance a competitive position.
Autonomy	EO_AUT1	I am willing to let my employees do their jobs without interference.
	EO_AUT2	I allow my employees to communicate with managers freely.
	EO_AUT3	I am willing to let my employees improve their jobs.
	EO_AUT4	I allow my employees to act alone if they think it is good for the business.
	EO_AUT5	I am willing to let my employees do their jobs freely.
	EO_AUT6	My employees have access to all information relevant to their job.
	EO_AUT7	My employees must be closely supervised.

Appendix A cont.

Items on a 1 to 7 scale with anchors of Strongly Disagree (1) to Strongly Agree (7).

Actor Engagement		
Cognitive	AE_COG1	I like to search for information about other firms in the local/regional community.
	AE_COG2	I often search for information on other firms in the local/regional community.
	AE_COG3	I actively look for information related to other firms in the local/regional community.
	AE_COG4	I try to learn about other firms before I want to use them.
	AE_COG5	I try to learn from other people about the firms before I use them.
	AE_COG6	I use social media to find information on competitors.
Behavior	AE_BH1	I look for new services in the local/regional community.
	AE_BH2	I interact with other firms in the local/regional community.
	AE_BH3	Looking for services other firms provide makes me better understand the local/regional community.
	AE_BH4	I enjoy using services in the local/regional community.
	AE_BH5	I use services in the local/regional community first before looking outside this area.
	AE_BH6	I use the products and services that best fit my needs, regardless of whether or not the company is from my local/regional area.
Emotional	AE_EMO1	I like to do business with firms located in the local/regional community.
	AE_EMO2	I like to look for services in the local/regional community.
	AE_EMO3	I like to use services available from other businesses in the local/regional community.
	AE_EMO4	I feel positive when doing business with firms in the local community.
	AE_EMO5	Doing business with firms in the local community makes me feel good.

Appendix A cont.

	AE_EMO6	I conduct business with companies which offer me the best deal, whether they are local or not.
Social connection	AE_SOC1	My firm has a good reputation in the local/regional community.
	AE_SOC2	I prefer using the services of other firms in the local/regional community.
	AE_SOC3	My firm is well-connected to other firms in this industry.
	AE_SOC4	I read social media posts about products/services before I buy them.
	AE_SOC5	My firm has a good reputation for supporting the local/regional community.
	AE_SOC6	My firm has a good reputation for treating other firms fairly in the local/regional community.
	AE_SOC7	My firm shares knowledge about other firms in the local/regional community.
	AE_SOC8	My firm is well-connected to other firms in other industries.

Items on a 1 to 7 scale with anchors of Strongly Disagree (1) to Strongly Agree (7).

Firm Resources		
Resources	RS1	My employees have extensive technical knowledge.
	RS2	My Employees have the necessary skills to acquire excellent market information.
	RS3	I actively seek new ideas in the markets.
	RS4	I have easy access to financial capital to support our business operations.
	RS5	My employees are knowledgeable in their particular jobs and functions.
	RS6	My staff are knowledgeable about general business practices in this industry.

Appendix A cont.

Items on a 0 to 10 scale with anchors of Much Worse (0) to Much Better (10).

Performance		
Performance	PER1	Relative to my competitors, my firm is _____ at attaining market share.
	PER2	Relative to my competitors, my firm is _____ at achieving growth.
	PER3	Relative to my competitors, my firm's profitability is _____.
	PER4	Relative to my competitors, my firm is _____ at attracting competent employees
	PER5	Relative to my competitors, my firm is _____ at serving customers.
	PER6	Relative to my competitors, my firm is _____ at attracting loyal customers.
	PER7	Relative to my competitors, my firm is _____ at delivering customer satisfaction.
	PER8	Relative to my competitors, my firm's return on investment is _____.
	PER9	Relative to my competitors, my firm's overall performance is_____.

Items on a 1 to 7 scale with anchors of Strongly Disagree (1) to Strongly Agree (7).

Attention Check Questions		
Finance	ECO_F6	My community is not very good for entrepreneurial businesses.
Culture	ECO_C7	The culture of my community evaluates failure harshly
Market	ECO_M6	My community is an appropriate test market because it is similar to many other communities.
Autonomy	EO_AUT 7	My employees must be closely supervised
Emotional	AE_EMO6	I conduct business with companies which offer me the best deal, whether they are local or not.

Appendix A cont.

Demographic Questions

What is your age?
○ 18-29 ○ 30-39 ○ 40-55 ○ 55+ Years
What is your gender?
○ Male ○ Female ○ Non-binary / third gender ○ Prefer not to say
Where is your region?
○ South ○ West ○ Midwest ○ Northeastern ○ Other/Preferred not to Respond

Appendix A cont.

Years as entrepreneurs.
○ 1-3 years ○ 4-6 years ○ More than 6 years
What is your race or ethnic group?
○ White ○ Black or African American ○ American Indian or Alaska Native ○ Asian ○ Native Hawaiian or Pacific Islander ○ Other
What is the highest level of education that you have completed?
○ Less than high school ○ High school graduate ○ Some college ○ 2 year degree ○ 4 year degree ○ Professional degree ○ Doctorate

Appendix B

Outer Loadings

Construct Items	Standardized Loading			
Indicator	**Behavioral**	**Cognitive**	**Emotional**	**Social**
AE_BH1	0.803			
AE_BH2	0.822			
AE_BH3	0.846			
AE_BH4	0.833			
AE_BH5	0.74			
AE_COG1		0.881		
AE_COG2		0.895		
AE_COG3		0.859		
AE_COG4		0.743		
AE_COG5		0.766		
AE_COG6		0.602		
AE_COG6				
AE_EMO1			0.887	
AE_EMO2			0.913	
AE_EMO3			0.894	
AE_EMO4			0.892	
AE_EMO5			0.866	
AE_SOC1				0.764
AE_SOC2				0.682
AE_SOC3				0.829
AE_SOC5				0.859
AE_SOC6				0.788
AE_SOC7				0.768
AE_SOC8				0.816

Appendix B cont.

Construct Items	Standardized Loading					
Indicator	**Culture**	**Finance**	**Human**	**Market**	**Policy**	**Support**
ECO_C1	0.842					
ECO_C3	0.905					
ECO_C4	0.862					
ECO_C5	0.786					
ECO_C6	0.777					
ECO_C6						
ECO_F1		0.751				
ECO_F2		0.727				
ECO_F3		0.816				
ECO_F4		0.771				
ECO_F5		0.657				
ECO_H1			0.835			
ECO_H2			0.842			
ECO_H3			0.843			
ECO_H4			0.818			
ECO_H5			0.744			
ECO_M1				0.809		
ECO_M2				0.872		
ECO_M3				0.833		
ECO_M4				0.865		
ECO_M5				0.628		
ECO_P1					0.895	
ECO_P2					0.886	
ECO_P3					0.821	
ECO_P4					0.866	
ECO_P5					0.814	
ECO_P6					0.857	
ECO_P7					0.74	
ECO_S1						0.842
ECO_S2						0.874
ECO_S3						0.87
ECO_S4						0.838
ECO_S5						0.883

Appendix B cont.

Construct Items	Standardized Loading				
Indicator	**Autonomy**	**Competitiveness**	**Innovativeness**	**Proactiveness**	**Risk-Taking**
EO_AUT2	0.878				
EO_AUT3	0.896				
EO_AUT4	0.727				
EO_AUT5	0.848				
EO_AUT6	0.879				
EO_COM1		0.828			
EO_COM2		0.883			
EO_COM3		0.89			
EO_COM4		0.653			
EO_COM5		0.583			
EO_INO1			0.786		
EO_INO2			0.832		
EO_INO3			0.858		
EO_INO4			0.826		
EO_INO5			0.795		
EO_PRO1				0.521	
EO_PRO2				0.74	
EO_PRO3				0.825	
EO_PRO4				0.772	
EO_PRO5				0.806	
EO_PRO6				0.766	
EO_RIK1					0.725
EO_RIK2					0.839
EO_RIK3					0.833
EO_RIK4					0.821
EO_RIK5					0.786

Appendix B cont.

Construct Items	Standardized Loading	
Indicator	**Performance**	**Resources**
PER1	0.807	
PER2	0.803	
PER3	0.779	
PER4	0.766	
PER5	0.703	
PER6	0.78	
PER7	0.682	
PER8	0.799	
PER9	0.847	
RS1		0.721
RS2		0.811
RS3		0.705
RS4		0.554
RS5		0.789
RS6		0.769

Appendix C

IRB Approval to Conduct Research

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INSTITUTIONAL REVIEW BOARD
September 14, 2022

Principal Investigator:	Sonny Nguyen		
IRB # and Title:	IRB PROTOCOL: 22-350 [1955146-1] Entrepreneurial Ecosystems		
Status:	APPROVED	Review Type:	Exempt Review
Approval Date:	Sept. 14, 2022	Submission Type:	New Project
Initial Approval:	Sept. 14, 2022	Expiration Date:	
Review Category:	45 CFR 46.104 (d)(2): Research that only includes interaction involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior (including visual or auditory recording): i. Information obtained is recorded by the investigator in such a manner that the identity of human subjects cannot be readily ascertained, directly or through identifiers linked to the subjects		

This panel, operating under the authority of the DHHS Office for Human Research and Protection, assurance number FWA 00001602, and IRB #00000286 or #00011574, has reviewed the submitted materials for the following:

1. *Protection of the rights and the welfare of human subjects involved.*
2. *The methods used to secure and the appropriateness of informed consent.*
3. *The risk and potential benefits to the subject.*

The regulations require that the investigator not initiate any changes in the research without prior IRB approval, except where necessary to eliminate immediate hazards to the human subjects, and that **all problems involving risks and adverse events be reported to the IRB immediately!**

Subsequent supporting documents that have been approved will be stamped with an IRB approval and expiration date (if applicable) on every page. Copies of the supporting documents must be utilized with the current IRB approval stamp unless consent has been waived.

Notes:

BIOGRAPHICAL SKETCH

Name of Author: Sonny Lam Nguyen

Graduate and Undergraduate Schools Attended:

University of South Alabama, Mobile, Alabama

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