
Entrepreneurial Ecosystem and Performance of SMEs in Pakistan

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Abstract:

Purpose: This study aims to measure the entrepreneurial ecosystem of Pakistan and examining its effect on SMEs' performance. A thriving business sector is indispensable for the economic growth of a country. Businesses nurture an environment that is supportive for the entry, survival, and growth of entrepreneurs. The concept of the entrepreneurial ecosystem, as a combination of interdependent factors, is relatively new in entrepreneurship, especially in developing countries.

Research/Methodology/Design: The World Bank Enterprise Survey data of 2049 SMEs for the years 2006 and 2013 has been used to get entrepreneurs' perceptions of Pakistan's entrepreneurial ecosystem. The cluster analysis and canonical discriminant analysis are used to measure the entrepreneurial ecosystem of Pakistan, and regression analysis is used to estimate its effect on SMEs' performance.

Findings: The findings suggest that the entrepreneurial ecosystem of Pakistan, as a system, is a constraint on SMEs' performance. However, the lack of a skilled workforce to meet the needs of modern industrial technologies is most negatively affecting SMEs' performance.

Practical Implications: It can be concluded that there is no one perfect recipe for setting up an entrepreneurial economy, however, research should use a bottom-up approach to provide these practical yet imperfect roadmaps to the policymakers for devising a set of actions for gradually shaping the entrepreneurial ecosystems in a specific direction.

Originality/Value: Entrepreneurial ecosystems is a novel way of looking at entrepreneurial activity in a region. Most of the research in this domain is descriptive and theoretical, lacking empirical support, especially in developing countries. Therefore, this research is a contribution to the body of knowledge on entrepreneurship and entrepreneurial ecosystems.

Keywords: Entrepreneurial ecosystem, entrepreneurship, enterprise survey, firm performance, SMEs.

JEL classification: L25, L26.

Research type: Research article.

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1. Introduction

Rwanda, whose people and institutions have been destroyed severally due to the 1990s genocide, had been ranked at number 148 in the doing business ranking by the World Bank in 2009. However, through the government's adoption of business-friendly policies, it made a significant jump in the ranking and was ranked at 67 in the ease of doing business ranking by the World Bank in 2010. Its latest ranking is 41 in the ease doing a business report of 2017. It is now way ahead of Italy, Hungary, and Mexico in terms of ease of doing business, and it has almost quadrupled per capita GDP since 1995. This is the kind of development that entrepreneurship can assure, which is why governments, development agencies, and aid agencies are interested in entrepreneurship. Paul Kagame, the Rwanda president, said, "Entrepreneurship is the surest way of development." In the contemporary world, he is not the lone voice.

It has been globally agreed by researchers and practitioners of development economics that a thriving private business sector is indispensable for the economic growth and sustainability of any country. According to Schumpeter, as quoted by Barreto (2013), economic development is a continuum of series of new processes, new markets, new sources, and news organizations, all of which are a product of entrepreneurial activity (Barreto, 2013). The cycle of entrepreneurial activity ensures that innovative and productive businesses survive the test of time and less productive businesses that could not compete with the pace of development are replaced. Thus, new opportunities arise because of innovation and competition and die because of imitation. However, the ultimate beneficiary is the economy of the country and region.

The entrepreneurs disrupt the status quo by introducing innovative products, services, and procedures (Schumpeter, 1934). However, such entrepreneurs' existence in high proportion depends on a set of institutional framework and physical conditions making the entrepreneurial environment conducive for entry, survival, and growth of businesses. Such an environment has been called the entrepreneurial ecosystem. The entrepreneurial ecosystem is created by a collaborative effort of all the stakeholders involved in this process (Spigel and Harrison, 2018; Stam, 2015). However, the significant players are government and entrepreneurs.

The institutional framework consists of government regulations, taxation system, and control over corruption, whereas physical conditions include access to finance, infrastructural support, political stability, availability of skilled labour force, and competition with the informal economy. The combination of these institutional frameworks and physical conditions makes the entrepreneurial ecosystem either supportive or constraining for the entry, survival, and growth of entrepreneurs. This is the supportive entrepreneurial ecosystem based on years of improvement in the institutional framework and physical conditions, which has led to the creation of the famous Silicon Valley (Isenberg, 2008).

The success of the entrepreneurial ecosystem is measured using different parameters. One of the most frequently used indicators of success or failure of the entrepreneurial ecosystem has been the incumbent firms' performance (Aspen Network of Development Entrepreneurs, 2013; Auerswald, 2015; Spigel, 2017). Since most entrepreneurs in the world start from either a small or a medium-sized business and progress to a large scale with time, the performance of small and medium-sized firms is used in this study to gauge the success of the entrepreneurial ecosystem in Pakistan. SMEs are considered as job creators in both developed and developing economies. Whereas in developing economies with higher unemployment levels, SMEs are strategically used in government planning for creating more job opportunities for the unemployed (Ayyagari, Demirguc-Kunt, and Maksimovic, 2014; Haltiwanger, Jarmin, and Miranda, 2013; Purbasari *et al.*, 2019). Therefore, it is essential to arrange institutional frameworks and physical conditions to help SMEs' entry and growth.

The majority of entrepreneurs in developing countries start a business out of necessity and remains unable to grow and sustain beyond a specific limit. The shift from necessity-based to opportunity-based entrepreneurship in developing countries requires adopting an evolutionary approach by researchers and policymakers to make the entrepreneurial ecosystem supportive for the entrepreneurs. The promotion of the entrepreneurial ecosystem requires one big success to stimulate many other potential entrepreneurs who are afraid of entry barriers and investment risks.

Governments have successfully implemented this formula of small numbers to get positive results. Such an early visible exemplary success of anyone entrepreneur can help reduce the negative perceptions about the ecosystem. Such successful entrepreneurs exist in every society, the government needs to make them visible to aspiring entrepreneurs for clearing their minds of negativities. There are abundant examples of how one success in entrepreneurship can synergize the whole effort to provide a conducive ecosystem. Sometimes even over the celebration of such small successes have positive effects. Appreciation by media, awards in publicized events, and acknowledgment at any government level are expected to impact the entrepreneurial ecosystems significantly. In Hong Kong, entrepreneurs of even trim levels would love to show off their wealth as a status symbol, whereas in Subcontinent, they could invite tax collectors or secret services.

The efforts to replicate the successful entrepreneurship model from other parts of the world have failed bitterly in every part of the world. In this process, the first step is to identify and analyse the existing entrepreneurial ecosystems because entrepreneurship is nurtured and grown in a specific environment. The existing ecosystem analysis will reveal the strengths and weaknesses, guiding the necessary interventions to gradually change the existing entrepreneurial ecosystem to be a home for opportunity-based entrepreneurs. Moreover, in this evolutionary process, the government should use an invisible hand model rather than a grabbing hand model of government.

This study is aimed at finding answers to the following research questions:

- What type of entrepreneurial ecosystem is functional in Pakistan?
- How entrepreneurial ecosystem affects the performance of SMEs?

2. Literature Review

SMEs are a dominant form of business across the globe. More than 125 million SMEs globally, with more than 90 million in emerging economies (Kushnir, Mirmulstein, and Ramalho, 2010). SMEs have significantly contributed to employment generation, productivity growth, innovation, and economic growth. They have proved to be a vital component of a thriving private business sector. Their contributions in multiple dimensions of the economy have encouraged the policymakers to promote pro-SME policies. Also, international donor agencies have sponsored multi-billion-dollar aid to promote SMEs, especially in developing countries (Nicotra *et al.*, 2018; Ghani, Kerr, and O'Connell, 2011). It has pushed SMEs' case to be a crucial component of policies aimed at economic revival and growth.

The entrepreneurship and development researchers have consistently presented new firm formation as a source of efficient economic growth and rapid job creation. According to ease of doing a business report of the world, Rwanda, Chile, Israel, and Iceland are the most fertile countries for new firm formation, which has all been due to their governments' significant efforts (Isenberg, 2010). Though individuals establish new firms, these entrepreneurs are directly or indirectly affected by the government who provides an environment that nurtures and sustains or discourages and devastates entrepreneurship. As a result, the entrepreneurial ecosystems are now given special importance in both developed particular and developing economies' government policies.

An ecosystem that ensures that the external environment remains conducive for the survival, growth, and maturity of business activity is called an entrepreneurial ecosystem (Audretsch and Link, 2019; Purbasari *et al.*, 2019; Bell-Masterson and Stangler, 2015; Mason and Brown, 2014). This has been the latest dimension of looking at the performance of SMEs. It elucidates the institutional factors' role in promoting an entrepreneurial culture that brings resilience to entrepreneurial ventures. The early institutional theory by North (1990) considered the institutional factors totally beyond the control of entrepreneurs. However, later developments in theory by Baumol (1990) and Parker (2009) argued that the regulators have also used the entrepreneurs' feedback on the institutional factors to tweak the framework conditions.

The entrepreneurial ecosystem has primarily been considered a reality that lies outside the realms and control of any single entrepreneur. However, it is also believed that entrepreneurs' reaction on the institutional framework conditions does play a role when improvements in the ecosystem are suggested. Isenberg (2011) argued that in

an ideal entrepreneurial ecosystem, the entrepreneurs should be considered drivers of ecosystems, and government and other stakeholders should play the role of facilitator. According to Isenberg (2010), new and indigenized practices developed murkily should not dissuade governments from carrying on their experimentation. The governments in developing countries should keep on following their half-cooked and ever-changing policies by persistently refining them. The alternative model of taking years in developing an ideal model of promoting entrepreneurship and doing nothing meanwhile is unaffordable to these economies.

However, this continuous refinement of ever-changing prescriptions requires stability in the governments' approach, which is absent in many developing countries as they are unfortunately politically unstable. However, experimentation and continuous feedback are the right way to achieve the desired ecosystem. The entrepreneurial ecosystem components are the same, but their ranking concerning significant contributions varies for countries with different cultures, economies, technology, and demography.

Unfortunately, many governments have not conceived entrepreneurial ecosystem in its true spirit and try to replicate the successful model of entrepreneurship from other parts of the world, which need not be similar to them by any means (Williams and Vorley, 2017; Mack and Mayer, 2016; Isenberg, 2008). In this pursuit, some governments have adopted best practices of economies entirely different from them. Many governments are pursuing the unachievable by trying to create another Silicon Valley. On the other hand, surprisingly, the most effective strategies have emerged from the less privileged areas where governance, infrastructure, and law and order are not in the best shape. The picture of entrepreneurship in these parts of the world is entirely different from the developed world.

In recent years, governments, academic institutions, development agencies like the World Bank, the World Economic Forum, the Organization of Economic Cooperation and Development (OECD), business consultants, and researchers have developed specific frameworks for measuring and assessing entrepreneurial ecosystems. These frameworks include Entrepreneurship Measurement Framework by the OECD, ICT Entrepreneurship by the GSM Association, Doing Business global ranking by the World Bank, and Global Entrepreneurship and Development Index by the George Mason University, Asset Mapping Roadmap, Babson Model, and the Innovation Rainforest Blueprint (Bell-Masterson and Stangler, 2015). These models vary in their scope, level, and comparability, and their implementation is severally affected by the scarcity of comparable data. The models are based on case studies of developed countries only, whereas developing countries have entirely different sets of challenges and opportunities and are expected to have different entrepreneurial ecosystems.

However, these existing conceptual models can be used to understand the composition of developing countries' entrepreneurial ecosystems. Moreover, it is essential to note that these frameworks are just theoretically argued and lack a

standard set of variables for cross-border comparisons. These proposed theoretical models build an entrepreneurial ecosystem around access to finance, infrastructure, market regulations, human capital, corruption, research and development, and culture.

Moreover, the existing research based on the business environment perspective has used macro-level data like corruption index, infrastructure ranking, GDP, etc., to measure the effect of business environment on firms (Ayyagari, Demirgüç-Kunt, and Maksimovic, 2008). However, this macro-level data is unable to measure firms' specific business environments. For example, there are different forms of corruption, including household, public, administrative, and political corruption, whereas only administrative corruption is related to firms. Therefore, it is methodologically not suitable to use these macro measures for any specific segment like firms. Thus, firm-level response on different business environment dimensions is required for accurate assessment of the entrepreneurial ecosystem. This study will fill this gap by using firm-level responses on the entrepreneurial ecosystem's components (institutional framework and physical conditions) and testing its relationship with SMEs' performance. It will be interesting to see how the entrepreneurial ecosystem of Pakistan is composed and how components of the entrepreneurial ecosystem interactively affect SMEs' performance.

3. Research Methodology

The World Bank Enterprise Survey database is used to respond to 2049 small and medium-sized enterprises in Pakistan on the components of the entrepreneurial ecosystem for the years 2007 and 2013 (Enterprise Survey, 2006-14). The enterprise surveys are conducted by the World Bank in different rounds across different countries in the world. The stratified sampling has been adopted using geographical location, sector of business activity, and business size to ensure that the sample selected is representative of the population. The descriptive statistics given in Table 1 show that more than 60 percent of small businesses in the sample and sole proprietorship as the form of ownership dominate with 72 percent share. The distribution of firms concerning age and year of the survey is balanced.

Cluster analysis and canonical discriminant analysis (CDA) have been used to identify the composition of the entrepreneurial ecosystem existing in Pakistan. A multiplicative index has been generated using the findings of CDA to find the effect of the entrepreneurial ecosystem on the performance of SMEs. The detailed analysis of data is given in the following section.

4. Results and Discussion

Cluster Analysis has been used to figure out patterns in the data for finding the entrepreneurial ecosystems existing in Pakistan. Cluster analysis helps group the respondents based on the similarity of their response on the selected attributes (Han, Pei, and Kamber, 2012), components of the entrepreneurial ecosystem in this case.

Agglomeration methods among different hierarchical clustering techniques are used as many groups are not known beforehand and determined after assessing the trends existing in data (Everitt, Landau, Leese, and Stahl, 2011). The Ward's Linkage algorithm in STATA14 is used with matching methods as similarity measures to implement the cluster analysis. Thus, natural trends in entrepreneurs' responses to elements of the institutional framework and physical conditions have been used to develop groups with intragroup homogeneity and inter-group heterogeneity. The results reported in Tables 2 and 3 show that five groups identified through cluster analysis are homogenous within and heterogeneous between.

Table 1. Descriptive Statistics of SMEs in Pakistan as per WBES database 2007 and 2013

Variables		Freq.	Percent
Firm Size	Small (<20)	1259	61.4
	Medium (20-99)	790	38.56
Sector	Services Sector	310	15.13
	Manufacturing Sector	1739	84.87
Legal Form	Sole Proprietorship	1491	72.77
	Share Holding Company	173	8.44
	Partnership	343	16.74
	Limited Partnership	30	1.46
	Other	12	0.59
Firm Age	Young (age up to 5 Years)	881	43
	Old (age more than 5 Years)	1168	57
Year of Survey	2007 survey	1078	52.61
	2013 survey	971	47.39

Source: Own creation.

Table 2. Distribution of firms in groups identified by the Cluster Analysis

Clusters	Frequency	Percentage
1	349	17.03
2	411	20.06
3	430	20.99
4	324	15.81
5	535	26.11

Source: Own creation.

Table 3. Mean values of city level aggregates of firms' response on components of the entrepreneurial ecosystem with respect to clusters identified using the Cluster Analysis

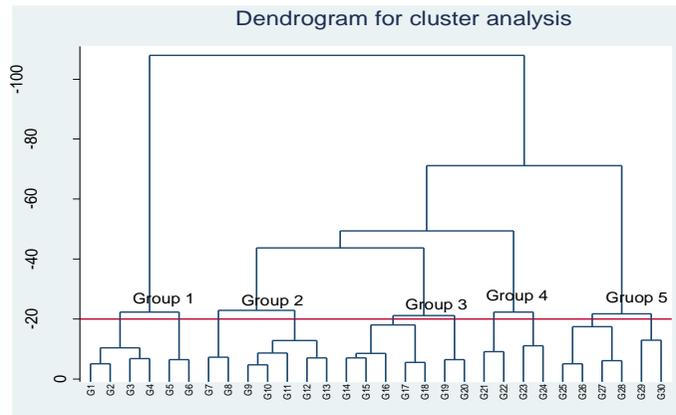
	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Government regulations	50.24	44.69	37.57	39.35	33.35
Tax rates and administration	50.08	48.06	49.35	45.73	43.70
Corruption	69.16	66.19	63.71	65.52	54.40
Access to finance	23.07	20.10	18.30	16.40	14.25
Infrastructure	46.72	40.65	37.18	41.11	33.19
Electricity	77.97	78.57	78.67	64.71	81.45

Political instability	51.52	47.73	51.06	45.74	34.86
The non-availability of an educated workforce	19.85	16.03	10.75	11.86	10.92
Competition with informal sector	19.31	16.00	16.97	15.36	14.38
Observations	349	411	430	324	535

Source: Own creation.

The process of cluster analysis using the algorithm mentioned above starts with considering each firm as a separate cluster, then a grouping of similar firms continues and ends at a stage when all firms are grouped in one cluster. The dendrogram is the outcome of this analysis, and it helps determine the optimum number of clusters existing in data (Kaufman and Rousseeuw, 2008). A dendrogram shown in Figure 1 shows that groups will be balanced if the number is fixed at 5. Thus, entrepreneurs can be divided into five groups which are similar within and different from each other concerning responses on the components of the entrepreneurial ecosystem of Pakistan.

Figure 1. Dendrogram of SMEs response on Components of Entrepreneurial Ecosystem of Pakistan



Source: Own creation.

Based on the cluster analysis results, the composition of the entrepreneurial ecosystem of Pakistan is figured out using Canonical Discriminant Analysis. The five groups identified in the cluster analysis are used to derive four functions based on different combinations of the covariates used in the analysis. It can be inferred from the results of canonical discriminant analysis given in Table 4 that these four functions are unique and statistically significantly different from each other.

The results reported in Table 5 are factor loadings of components of the entrepreneurial ecosystem of Pakistan. These factor loadings are like beta weights, and according to Comrey and Lee (1992), McLachlan and Geoffrey (2004), and Tabachnick and Fidell (2007), factor loading of more than 0.4 indicates the statistically significant contribution of a factor to its functions. It can be seen from factor loadings given in Table 5 that most of the functions are loaded highly on function 4.

Table 4. Canonical linear discriminant analysis

Function	Canonical Correlation	Eigen value	Variance Proportion	Prob>F
1	0.385	0.174	0.454	0.000
2	0.318	0.113	0.294	0.000
3	0.269	0.078	0.203	0.000
4	0.136	0.019	0.049	0.000

Source: Own creation.

Table 5. Standardized canonical discriminant function coefficients

Covariates	function1	function2	function3	function4
Government regulations	-0.688	-0.159	1.094	2.424
Tax rates and administration	0.016	-0.095	-0.235	-0.745
Corruption	0.055	-0.026	-0.168	-0.351
Access to finance	0.035	-0.062	0.052	-0.075
Infrastructure	0.054	-0.203	-0.223	-1.454
Political instability	-0.289	0.080	-0.965	0.636
The non-availability of an educated workforce	-0.177	-0.157	-0.044	-1.013
Competition with informal sector	0.085	-0.068	-0.144	-0.617
Electricity	0.580	-0.831	-0.257	-0.056

Source: Own creation.

These factor loadings are based on the interdependent relationship of components of the entrepreneurial ecosystem of Pakistan. The inclusion or exclusion of any components is expected to change the value of factor loadings. These factor loadings are used to calculate a discriminant score for each firm, as given in equation 1. These discriminant scores indicate a multiplicative index based on these factor loadings. Thus, this index can be considered as systematic and interdependent nature of the effect of the entrepreneurial ecosystem of Pakistan.

$$D_i = 2.424 * reg_i - 0.745 * tax_i - 0.351 * corr_i - 1.454 * infras_i + 0.636 * pol_i - 0.617 * inf_i - 1.013 * wk_i \tag{1}$$

Multiple regression methods have been used to assess the impact of the entrepreneurial ecosystem on the performance of incumbent SMEs. The summarized results given in Table 6 show that the entrepreneurial ecosystem of Pakistan is a constraint on the performance of firms of different sizes and ages. The comparative analysis of the firms based on size and age indicates that medium-sized and young firms are relatively more negatively affected by the constraining entrepreneurial ecosystem of Pakistan. The feedback loop mechanism of how entrepreneurs feed into the entrepreneurial ecosystem of Pakistan is not measured in this study because of the non-availability of such data.

However, looking at entrepreneurship is yet new and needs more empirical evidence to guide the academicians and policymakers in the right direction.

5. Conclusion

It can be concluded based on the findings of this study that the entrepreneurial ecosystem of Pakistan is overall constraining for small and medium-sized firms. The government needs to provide better infrastructural support, which has been the focus of the current government, and the infrastructural conditions have improved. However, further steps need to be taken to improve the skill set of the labour force. Moreover, the entrepreneurs need to play an essential role by providing constructive feedback to the policymakers for improvements in the business environment.

Moreover, the policymakers need to use a bottom-up approach for developing some practical guidelines, even imperfect ones, to feel the issue to be taken care of. There is no one perfect recipe for setting up an entrepreneurial ecosystem. However, the research should provide these practical yet imperfect roadmaps to the policymakers for devising a set of actions for gradually improving the entrepreneurial ecosystems. There is a need for more research in this direction. Moreover, the availability of panel data at the micro-level will help in this cause.

6. Implications

The concept of the entrepreneurial ecosystem is dynamic, and multiple interdependent stakeholders together determine its effectiveness. The findings of this study emphasize the evolutionary nature of the entrepreneurial ecosystem and developing countries like Pakistan are suggested to examine their system independently and strive for gradually tweaking and improving their system for making it conducive for the entry, survival, and growth of firms.

Pakistan needs to work on the skill development of the workforce because it will play a vital role in the successful industrialization of the country under foreign investment in the industry through China Pakistan Economic Corridor (CPEC). This economic transformation can only be achieved if the workforce is trained to handle modern machinery. The game-changer nature of CPEC can only be achieved if the workforce is ready to take the challenge of working on advanced technology.

Table 6. Estimation of the effect of the entrepreneurial ecosystem of Pakistan on the performance SMEs

	Sales growth			Employment growth			Labour productivity growth		
	All firms	Small firms	Medium firms	All firms	Small firms	Medium firms	All firms	Small firms	Medium firms
Entrepreneurial Ecosystem of Pakistan	-0.25*** (0.06)	- 0.21** *	- 0.30** *	-0.01* (0.04)	-0.02* (0.05)	- 0.06** (0.07)	- 0.47* *	- 0.74* ** (0.37)	-0.70* (0.64)
Constant	8.63***	11.98***	3.76** *	12.74***	12.06***	13.72* **	12.55***	5.37* **	6.58** *

	(1.21)	(1.55)	(1.91)	(0.84)	(1.24)	(1.45)	(1.67)	(1.41)	(2.31)
R²	0.10	0.08	0.14	0.08	0.04	0.07	0.12	0.01	0.09
F-test	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	2049	1259	790	2049	1259	790	2049	1259	790

Source: Own creation.

Table 7. Estimation of the effect of the entrepreneurial ecosystem of Pakistan on the performance SMEs

	Young firms	Old firms	Young firms	Old firms	Young firms	Old firms
Entrepreneurial Ecosystem of Pakistan	-0.44*** (0.10)	-0.13* (0.07)	-0.038* (0.06)	-0.01 (0.04)	-0.50* (0.68)	-0.78** (0.37)
Constant	4.39*** (1.89)	11.39*** (1.57)	14.97** * (1.55)	11.11** (1.20)	9.67** (2.58)	7.08*** (10.35)
R²	0.12	0.09	0.05	0.07	0.03	0.10
F-test	0.000	0.000	0.000	0.000	0.000	0.000
Observations	881	1168	881	1168	881	1168

Note: *** Significant at 1%, ** significant at 5% and * significant at 10%, Robust standard errors are in parenthesis; Young firm have age less than 5 years, others are old.

Source: Own creation.

References:

Aspen Network of Development Entrepreneurs. 2013. Entrepreneurial Ecosystem Diagnostic Toolkit: UKaid.

Audretsch, D.B., Link, A.N. 2019. Embracing an Entrepreneurial Ecosystem: An Analysis of the Governance of Research Joint Ventures. *Small Business Economics*, 52(2), 429-436.

Auerswald, P.E. 2015. Enabling Entrepreneurial Ecosystems: Insights from Ecology to Inform Effective Entrepreneurship Policy Kauffman Foundation Research Series on City, Metro and Regional Entrepreneurship. Kansas: United States: Ewing Marion Kauffman Foundation.

Ayyagari, M., Demirguc-Kunt, A., Maksimovic, V. 2014. Who Creates Jobs in Developing Countries? *Small Business Economics*, 43(1), 75-99.

Ayyagari, M., Demirgüç-Kunt, A., Maksimovic, V. 2008. How Important are Financing Constraints? The Role of Finance in the Business Environment. *The World Bank Economic Review*, 22(3), 483-516.

Barreto, H. 2013. The entrepreneur in microeconomic theory: Disappearance and explanation: Routledge.

Baumol, W.J. 1990. Entrepreneurship: Productive, Unproductive, and Destructive. *Journal of Political Economy*, 98(5), 893-921.

- Bell-Masterson, J., Stangler, D. 2015. Measuring an Entrepreneurial Ecosystem Kauffman Foundation Research Series on City, Metro, and Regional Entrepreneurship. Kansas City, Missouri: Ewing Marion Kauffman Foundation.
- Comrey, A.L., Lee, H.B. 1992. Interpretation and application of factor analytic results. Comrey AL, Lee HB. A first course in factor analysis, 2, 1992.
- Enterprise Survey. 2006-14. World Bank Enterprise Survey. In: W. Bank (Ed.). Washington, DC.
- Everitt, B.S., Landau, S., Leese, M., Stahl, D. 2011. Hierarchical Clustering Cluster Analysis (5th Edition ed., pp. 71-110). West Sussex: United Kingdom: John Wiley & Sons, Ltd.
- Friedman, J.H. 1989. Regularized Discriminant Analysis. Journal of the American Statistical Association, 84(405), 165-175.
- Ghani, E., Kerr, W.R., O'Connell, S.D. 2011. Who Creates Jobs? Poverty Reduction and Economic Management Network. Washington, D.C.: World Bank.
- Haltiwanger, J., Jarmin, R.S., Miranda, J. 2013. Who Creates Jobs? Small versus Large versus Young. Review of Economics and Statistics, 95(2), 347-361.
- Han, J., Pei, J., Kamber, M. 2012. Cluster Analysis: Basic Concepts and Methods Data Mining: Concepts and Techniques, 3, 443-495.
- Isenberg, D.J. 2008. The Global Entrepreneur. Harvard Business Review, 86(12), 107-111.
- Isenberg, D.J. 2010. How to Start an Entrepreneurial Revolution. Harvard Business Review, 88(6), 40-50.
- Isenberg, D.J. 2011. The Entrepreneurship Ecosystem Strategy as a New Paradigm for Economic Policy: Principles for Cultivating Entrepreneurship Babson Entrepreneurship Ecosystem Project. Babson Park: MA: Babson College.
- Kaufman, L., Rousseeuw, P.J. 2008. An Introduction to Cluster Analysis Finding Groups in Data, 1-67, John Wiley & Sons, Inc.
- Kushnir, K., Mirmulstein, M.L., Ramalho, R. 2010. Micro, Small, and Medium Enterprises around the World: How many are there, and What Affects the Count MSME Country Indicators Analysis Note. Washington: World Bank/IFC.
- Mack, E., Mayer, H. 2016. The Evolutionary Dynamics of Entrepreneurial Ecosystems. Urban Studies, 53(10), 2118-2133.
- Mason, C., Brown, R. 2014. Entrepreneurial Ecosystems and Growth Oriented Entrepreneurship. Paris: OECD.
- McLachlan, G. 2004. Discriminant analysis and statistical pattern recognition, 544, John Wiley & Sons.
- Nicotra, M., Romano, M., Del Giudice, M., Schillaci, C.E. 2018. The Causal Relation between Entrepreneurial Ecosystem and Productive Entrepreneurship: A Measurement Framework. The Journal of Technology Transfer, 43(3), 640-673.
- North, D.C. 1990. Institutions, Institutional Change and Economic Performance. Cambridge University Press.
- Parker, S.C. 2009. The Economics of Entrepreneurship. Cambridge: Cambridge University Press.
- Purbasari, R., Wijaya, C., Rahayu, N. 2019. The Entrepreneurial Ecosystem as a Network-Rich System: A Systematic Mapping Study. Academy of Entrepreneurship Journal, 25(2), 1-17.
- Schumpeter, J.A. 1934. The Theory of Economic Development. Cambridge: MA: Harvard University Press.
- Spigel, B. 2017. The Relational Organization of Entrepreneurial Ecosystems. Entrepreneurship Theory and Practice, 41(1), 49-72.

- Spigel, B., Harrison, R. 2018. Toward a Process Theory of Entrepreneurial Ecosystems. *Strategic Entrepreneurship Journal*, 12(1), 151-168.
- Stam, E. 2015. Entrepreneurial Ecosystems and Regional Policy: A Sympathetic Critique. *European Planning Studies*, 23(9), 1759-176.
- Tabachnick, B.G., Fidell, L.S. 2007. *Using multivariate statistics*, 5, Boston, MA: Pearson.
- Williams, N., Vorley, T. 2017. Fostering Productive Entrepreneurship in Post-Conflict Economies: The Importance of Institutional Alignment. *Entrepreneurship and Regional Development*, 29(5-6), 444-466.