Development and Validation of Extended Multi-Dimensional Scale of Entrepreneurial Ecosystem in the context of Pakistan

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Abstract

The purpose of this research is to validate the multi-dimensional scale of Entrepreneurial Ecosystem in the context of Pakistan. This research is based on 7 constructs with 54 items that affect the entrepreneurial ecosystem in any given region. The sample of 244 respondents are the owners of companies and, startups who participated in this research. The Confirmatory factory analysis showed factor loadings of all constructs greater than 0.40, while partial least square structural equation modeling showed acceptable values of construct reliability, composite reliability, however, average variance extracted was shown to be greater than 0.40 and less than the acceptable value of 0.5 for some constructs, while the HTMT ratio established discriminant validity of the constructs another criterion i.e. Fornell-Larcker criterion also established the discriminant validity of the constructs with some constructs having values less than 0.705, while some of the item outer loadings were found to be between 0.6-0.70 however, within the acceptable range. This research has validated the multi-dimensional scale of the entrepreneurial ecosystem with new sub-domain i.e. support professions and support finance. This scale can be used to measure the strength of the entrepreneurial ecosystem of any region with appropriate homogeneous sample.
Keywords: CFA, PLSE-SEM, EES, Ecosystem, Entrepreneurship, Regional Economy.

Introduction

Thriving entrepreneurship in any region is a panacea for economic development, job creation, and innovation, technological development, as well as improved standards of living. Moore (1993) first coined the term "Ecosystem" and observed that businesses operating within a certain region, regulatory framework and regional context necessitated the use of the term "Ecosystem" originally borrowed from biology. The term entrepreneurial ecosystem has gained wider popularity in recent years as it provides a holistic perspective on entrepreneurship. Scholars are trying hard to understand how the environment supports and hinders entrepreneurship and startup firms within a particular region (Cohen, 2006; Stam, 2015; Mack & Mayer, 2016). The need for the broader scope to understand the actors, institutions, their interaction, and interdependence should

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produce productive entrepreneurship within a certain region in any ecosystem (Stam, 2015). The transition from managed economy to the entrepreneurial economy would provide sustainable development for the nations (Audretsch, 2009). The economic success of any region depends on its nature of the entrepreneurial ecosystem system and how different dimensions of EE (Entrepreneurial Ecosystem) affects the performance of business firms, and how regional policy will enable the government to redirect the strategic resources to those dimensions steer that region into economic prosperity (Hechavarria & Ingram, 2014). However, research on the entrepreneurial ecosystem is still in a nascent stage and with little empirical underpinnings to come up with causal relationships within the ecosystem components (Stam, 2015). The typical ecosystem consists of customers, entrepreneurs, institutions, venture capitalists, governments, research institutions, supply chains, innovators, universities, banks, and research centers (Bhawe, N. & Zahra, S., 2017). The dynamic and vibrant ecosystem generates a kind of environment where firms compete, collaborate with each other, and generates growth in the nation's economy, and also sustain the ecosystem itself. This concept is dubbed as a systematic mechanism to analyze and nurture regional economies by putting entrepreneurs at the center stage (Isenberg, 2010, 2014).

The need for measuring entrepreneurial ecosystem is very important and many approaches and methodologies have been developed to cater to this need i.e works by Global Entrepreneurship Monitor (GEM), Kauffman Foundation, Doing Business; however, their work is at the national level and cannot be applied to the local or regional level; another work by Site Selection Magazine and Development Consultants International have developed metrics to rank different regions Guttman 2015; Stamer 2005). However, the lack of theoretical foundation and validity has raised doubts at this system (e.g., Arend 2004; Newman 2015).

Due to these issues, we in this research aim to extend the already developed multi-dimensional scale of the entrepreneurial Ecosystem developed by (Liguori, Eric, *et al.,* 2019). It is the first time we have applied multi-dimensional scale entrepreneurial ecosystem in the developing economy of Pakistan, this scale could be applied into different regions and cities and differences and similarities could tell us the state of entrepreneurial ecosystem as well as policy lessons. Novelty of this research is revelation of new sub domains in the EE.

The following are the research objectives:

- To extend the Entrepreneurial Ecosystem scale with more sub-dimensions
- Confirm and validate the Entrepreneurial Ecosystem scale in the context of Pakistan

This study is limited to the respondents, focusing on the entrepreneurs and founders/co-founders of startups/ firms. The additional EE scale including sub-

dimensions based on Isenberg's conceptual model (2010a, 2011a) is: policy, supports, support professions, human capital, markets, finance, Zero Stage Finance, the benefits of this scale is that it can be applied at any regional level national, city, state or province (Liguori, Eric *et al.*, 2019). This extended version of the multi-dimensional scale will help understand the broader context of the entrepreneurial ecosystem since this scale is perception-based; these can be discriminating and refining those measures which are objective (Powell 1996). This extended perception-based multi-dimensional measure is developed and validated, for the first time in a different context apart from the United States i.e in Pakistan. This different context will give us some interesting insights into the "Developing Country Entrepreneurial Ecosystem". Firstly, the paper discusses the current measures of the entrepreneurial ecosystem. Secondly, a discussion on some principles is provided and then the paper discusses the six domains including new sub-domains of the multi-dimensional scale of the entrepreneurial ecosystem. Thirdly, a discussion on generation of items for the measure is given. Lastly, discussions, limitations, and future research directions will be covered.

Literature Review

Current measurements are spearheaded by three main entities to assess and the entrepreneurial ecosystem i.e., Kaufman Foundation, GEM consortium, PSED (Panel Study of Entrepreneurial Dynamics). Their assessment methodology is applicable at the national level. Since all three lack assessment of entrepreneurial ecosystem at a national level, therefore, there is a need to have a mechanism to assess the entrepreneurial ecosystem at the community level to better understand the policy and environment where entrepreneurial community is starting and carrying out its entrepreneurial activities at regional, city and locality level (E. Ligouri *et al.,* 2019).

Roundy *et al.* (2018) in their research using qualitative comparative methods has stressed the need to study the entrepreneurial ecosystem from the lens of complexity science as an adaptive system, the researcher has connected the complexity of entrepreneurship and ventures into an entrepreneurial ecosystem.

The authors Stam and van de Ven (2019) have used system perspective to understand the entrepreneurial economies. They have developed an index to measure the entrepreneurial ecosystem of an economy and found that the value of firms depends on the quality of the entrepreneurial ecosystem. They further conclude that each element of the entrepreneurial ecosystem is interdependent.

Cantner *et al.* 2020 using analytical methods have proposed change in the entrepreneurial ecosystem model, the authors have incorporated the industrial life cycle perspective in the entrepreneurial ecosystem concept, they argue that their model can

capture the oscillations in the different phases of the entrepreneurial ecosystem's life cycle.

Donaldson, C. (2020) in his paper has focused on one key element entrepreneurial ecosystem i.e culture. He has developed the "cultural entrepreneurial ecosystem services" framework, which captures the dynamics of the cultural aspect of the entrepreneurial ecosystem.

According to (Pita *et al.,* 2021), the research objective was to understand the different patterns of the entrepreneurial ecosystem using a longitudinal study from GEM (Global Entrepreneurship Monitor) using logistic regression, they found significant differences among entrepreneurship determinants, their results suggest policy should be made according to regional contexts and framework conditions.

Modified MEES

Many of the past studies have developed measures rooted in economics. We seek to propose the extended version of the multi-dimensional scale of the entrepreneurial ecosystem developed by (Liguori, Eric *et al.,* 2019), in the developing country context i.e. Pakistan based on the conceptual model developed by Isenberg (2011). Isenberg (2010) prosed six domains for the entrepreneurial Ecosystem these domains are: a) policy; b) finance) culture; d) support; e) human capital; f) markets, based on the recommendations by (Liguori, Eric *et al.,* 2019), this modified MEES is extended with two subdomains a) support finance and b) support professions. Human resource is very critical for entrepreneurial activity if it is easily available in the geographic vicinity that makes EES more successful (News Ghana, 2016). Adequate access to capital affects the performance and success of any venture even in developed economies (Siepel, Cowling, & Coad 2017). Market domain means networking with early adopters, distribution channels, and diaspora in other countries and regions for example companies usually in diverse markets not just to test their products as well to expand their markets (Nashville, Orlando, Cincinnati, etc.; Pilny 2014).

Guiding Principles

The principles for measuring entrepreneurial ecosystem are based measure's application since Pakistan has thriving urban centers located in Karachi, Lahore, Peshawar, Islamabad, Quetta, these cities have different cultural milieu and the way of starting and doing business, thus the domain "Culture" is further extended with more items as suggested by (Liguori, Eric *et al.,* 2019). The second guiding principle is that the behavior is best predicted by the intent (Aijzen, 2001); thus, the perception of the entrepreneurial community would give greater insight into the entrepreneurial ecosystem of any given region.

Dimensions of MEES

The dimensions of MEES (multi-dimensional scale of the entrepreneurial ecosystem) are based on Isenberg's (2010) model of EES that includes 1) policy, 2) finance, 3) support, 4) Markets, 5) Culture, 6) Human Resources; the finance is subdivided into a source of finance and support into support professions. Policy refers to leadership and government support for entrepreneurial activities as well as rules and laws in place to protect the intellectual property of the entrepreneurs; Finance includes the banks, venture capitals, angel investors, and lending programs based on community as well the wealth of individuals within the community (Benjamin, Rubin & Zielenbach, 2004); Kedrosky & Stangler 2011). The culture domain is very important where it recognizes the importance of entrepreneurs, their failures, their support for creativity, and its importance for the entrepreneurial ecosystem, culture which supports entrepreneurial values is very important for vibrant EE, which sees entrepreneurship as an alternative and viable career option (Isenberg 2010a). Supports include infrastructure, support professionals, and entrepreneurial friendly institutions

Entrepreneurial ecosystem supports not only the entrepreneurial community to facilitate their behavior, but it also includes transportation, ICT services, energy support; support professions, friendly programs, institutions. Tampa Florida, USA is a good example of the existence of support and non-support and how it can make the entrepreneurial ecosystem vibrant or stagnant, in Tampa, Florida, there are 62 support organizations, the existence of support professions, and a sizable number of entrepreneurial programs for entrepreneurial communities, all these support factors have helped Tampa's meteoritic rise in entrepreneurship. On the other hand, poor infrastructure in terms of transportation is very dismal thus the lack of connectivity with R&D hubs hinders its entrepreneurial ecosystem (Kritzer 2016).

The authors (Eric Liguori *et al.,* 2019) have suggested to break down the six domains of the entrepreneurial ecosystem into further subdomains, that will help the researcher to understand even better the areas of strength and weaknesses within the particular entrepreneurial ecosystem of a given region. Furthermore, it's the generalizability this scale is to be tested again in different regions apart from the United States.

Methodology

Confirmatory Factor Analysis

For the study the sample of (n=244) participants are randomly selected, the survey participants were provided guidelines in regional languages while filling up the survey questionnaire. For validity we used the PLS-SEM using SmartPLS using factor method using consistent PLS Algorithm provided in SmartPLS, we established the

construct validity through Cronbach Alpha, composite reliability, average variance extracted, and convergent validity through Fornell-Larcker (1981) and HTMT ratio while consistent bootstrapping was used to find out the significance of the items on other items. These results indicate an acceptable range of Cronbach Alpha which was >0.70, composite reliability > 0.708, and AVE > 0.5 with some AVE's slightly less than 0.5. while convergent validity was established for all constructs through Fornell-Larcker (1981) criteria and HTMT with acceptable values of >0.708 and <0.09 for HTMT ratio.

Table 1: *Age*

		Frequency	Percent	Cumulative Percent
Valid	20-25 Years	67	27.5%	27.5
	26-30 Years	77	31.6%	59.0
	31-35 Years	42	17.2%	76.2
	36-40 Years	32	13.1%	89.3
	41-45 Years	22	9%	98.4
	45-50 Years	1	4%	98.8
	51-55 Years	2	8%	99.6
	> 60	1	4%	100.0
	Total	244	100.0	

The majority of the founders were in the age group (26-30) (32%), (20-25) (27.5%), (31-35) (17.2%), and all others between (36-60 years).

Table 2: *Education*

		Frequency	Percent	Cumulative Percent
Valid	Matriculation	35	14.3%	14.3
	Intermediate	57	23.4%	37.7
	Bachelor	62	25.4%	63.1
	Masters	76	31.1%	94.3
	PhD	11	4.5%	98.8
	Other	3	1.2%	100.0
	Total	244	100.0	

Participants surveyed had education level (Masters, 31%), (Bachelor, 25%), and all others (40%).

Table 3: *Gender*

		Frequency	Percent	Cumulative Percent
Valid	Male	209	85.7%	86.4
	Female	33	13.5%	100.0
	Total	242	99.2%	
Missing	System	2	8%	
Total		244	100.0%	

The majority of the participants were males (85.5%), Females (13.5%)

Table 4: *Rural or Urban*

		Frequency	Percent	Cumulative Percent
Valid	Rural	84	34.4%	34.4
	Urban	160	65.6%	100.0
	Total	244	100.0%	

More entrepreneurs were having an urban background (65.5%) followed by rural background (34.4%).

Table 5: *Industry*

	Frequency	Percent	Cumulative Percent
Education	31	12.70%	12.70
Software	33	13.52%	26.23
Engineering	26	10.66%	36.89
Food Industry	12	4.92%	41.80
IT Services	17	6.97%	48.77
Real estate	10	4.10%	52.87
Medicare	16	6.56%	59.43
Vendor	25	10.25%	69.67
Dairy	24	9.84%	79.51
Poultry	12	4.92%	84.43
Telecom	16	6.56%	90.98
Others	22	9.02%	100.00

Source: own compilation

Dimensions reduction was applied to reduce the items into one dimension, exploratory factor analysis categorizes all items into dimensions based on their loading

factor (Pedhazur & Schmelkin, 1991), we forced EFA on 8 common factors, and items with poor loading were eliminated i.e <0.70. This process reduced items into 53 items, these items can be generalized into different contexts and tap into an entrepreneur's perceptions about any regional entrepreneurial ecosystem. Factor loading for all construct was significant <0.5 as recommended by Hair *et al.,* (2006), all loadings were within the range of 0.49-0.8 for dimension reduction as recommended by Hair *et al.* (2006).

Table 6: *Summary of Individual EFA's*

Individual Exploratory Factor Analysis	Loadings
Finance	
F1. There are local individuals investors in our city/area who are willing to financially support entrepreneurial venturing.	.681
F2. Bankers in our city/area work hard to help entrepreneurs obtain financing.	.690
F3. Financing for entrepreneurs is available in our city/area	.674
F4. Information on what funding programs are available for entrepreneurs is easily accessible in our city/area	.655
F5. My city/area has a sufficient number of banks that are willing to lend to entrepreneurs.	.637
Support Finance	
SF1. My city/area has sufficient opportunities for venture capital funding for entrepreneurs	.724
SF2. My city/area has angel investors who are willing to support entrepreneurs	.744
SF3. In my city/area there are Organizations /Banks/Individuals who provide micro-loans for the entrepreneurs	.726
SF4. My city/area has Organizations / Banks /Individuals who provide zero stage capital	.823
Support	
Sup1. Our city/area has the infrastructure necessary to start and run most businesses (e.g telecommunication, transportation, energy)	.543
Sup2. Our City/Area has many entrepreneur-friendly organizations such as Rotary Clubs or Chamber of Commerce	.626
Sup3. Our city/area has Organizations /Banks/Individuals who provide micro-loans for the entrepreneurs	.740
Sup4. Professionals Services (e.g lawyers & accountants) for entrepreneurs are readily available in our city/area.	.726
Sup5. I believe the resources in our city/area are well designed to support business growth.	.606
Sup6. In our city/area the Local organizations, such as incubators and Small Business Development Authority (SMEDA) or other similar organizations are active in supporting local entrepreneurs.	.755
Sup7. In our city/area the governments have many programs/projects to Support Entrepreneurs	.616
Support Professions	
SP1. I can easily find legal support in our city/area for entrepreneurs	.717

SP2. I can easily find accounting services in our city/area for entrepreneurs	.744
SP3. Investment Bankers provide support in our city/area for entrepreneurs	.661
SP4. Our city/area has sufficient technical experts for entrepreneurs	.655
SP5. Our city/area has sufficient advisors for entrepreneurs	.649
Culture	
Cul1. The Social values and culture of the city/area emphasize creativity and innovation	.661
Cul2. The social values and culture of my city/area encourage entrepreneurial risk-taking	.687
Cul3. The social values and culture of my city/area emphasizes self-sufficiency, autonomy, and personal initiative	.628
Cul4. The social values and culture of our city/area appreciate new business formation over jobs	.717
Cul5. The social values and culture of our city/area tell us the success stories of businessman and entrepreneurs	.676
Cul6. The social values and culture of the city /area tolerate opposing viewpoints	.684
Cul7. The social values and culture of the city/ area encourage and tolerate new business experiments	.703
Cul8. The social values and culture of the area sees business failure as a norm and learn from the failure	.691
Human Resource	
HR1. Local or Provincial educational institutions offer specialized courses in entrepreneurship	.678
HR2. There are entrepreneurial training programs, such as entrepreneurship boot camps, accelerators, alumni meetings which are available in our city/area	.612
HR3. There are ample local institutions of higher education (universities, area colleges, technical colleges) in our city/area	.714
HR4. In our region, we have plenty of opportunities to work with Industry people	.659
HR5. In our region, we have international donors who provide training opportunities	.594
HR6. In our region, we have witness interaction between Industry and Academia	.664
Market	
MR1. The diversity in our city/area provides a great test market for many other locations	.756
MR2. In our city/area social networks could help me distribute new products across a variety of new markets	.739
MR3. In our city/area diversified population helps keep me connected to the National and Global economy	.612
Policy	
Pol1. The Local or Provincial government actively seeks to create and promote entrepreneurship friendly legislation	.737
Pol2. The local or Provincial government has programs in place to help new entrepreneurs, such as seed funding programs or entrepreneurship training programs.	.773
Pol3. Local and Provincial leaders regularly advocate for entrepreneurship	.795

Pol4. Provincial and Local Government has entrepreneurial programs and policies to support entrepreneurs	.802
Pol5. Provincial and Local governments have strong policies for the growth of entrepreneurship	.802
Pol6. Our Provincial and Local government understand the importance of Entrepreneurship for Job Creation and Economic growth in the regions	.781

Extraction Method: Principal Component Analysis.

Sample size N = 244. All factor loadings are significant at p < .05

Table 7: *Rotated Component Matrix*

	Component							
	1	2	3	4	5	6	7	8
Culture7	.811							
Culture4	.808							
Culture6	.776							
Culture5	.763							
Culture3	.763							
culture8	.755							
Culture2	.744							
Culture1	.671							
Policy5		.870						
Policy3		.866						
Policy4		.863						
Policy2		.830						
Policy1		.810						
Policy6		.784						
Support2			.688					
Support3			.680					
Support4			.671					
Support6			.646					
Support5			.625					
Support1			.615					
Support7			.412					
Support Professions 2				.781				
Support Professions 1				.710				

Support Professions 3	.697				
Support Professions 4	.602				
Support Professions 5	.554				
Finance 3		.780			
Finance 5		.727			
Finance 2		.715			
Finance 4		.710			
Finance 1		.598			
Human Resource 3			.702		
Human Resource 4			.692		
Human 6 Resource			.688		
Human Resource 5			.631		
Human Resource 1			.636		
Human Resource 2			.492		
Market 1				.788	
Market 2				.736	
Market 3				.656	
Support Finance 4					.861
Support Finance 1					.768
Support Finance 2					.576

Extraction Method: Common Factor

Rotation Method: Varimax

a. Rotation converged in seven iterations; Loadings below .4 are not displayed

**All factor loadings are significant at P < .05; N = 1244

Source: Own compilation

CFA Structure

The CFA performed in SmartPLS is given in figure 1, where all latent variables are connected without causal consideration and consistent PLS-Algorithm and consistent

Bootstrapping methods were performed. Item reliability is assessed through outer loadings the standard threshold value of outer loadings should be greater than (0.708), however, in newly developed scale in social sciences researchers usually observe weaker values of the outer loadings (Hulland, 1999), rather than removing the indicators with outer loadings <0.708, we have retained those indicators since the removal of the indicators reduces the composite reliability as well as AVE as recommended by (Hair et al, 2014); following the suggestions given in the literature the researchers have retained indicators with outer loading values between 0.40-0.708 to maximize their effect on composite reliability and content validity.
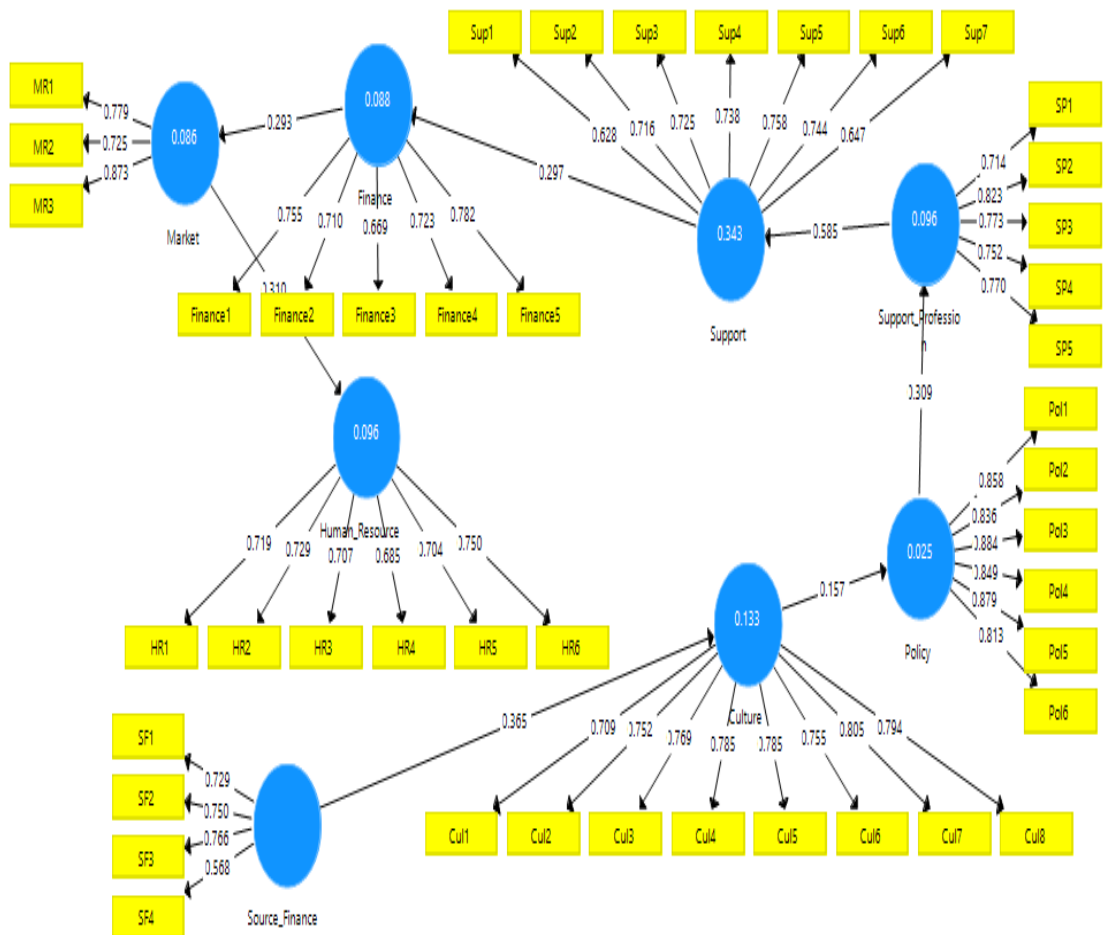

Figure 1: *CFA Performed in SmartPLS (Factor Method)*

Table 8: *Construct reliability*

Items	Outer Loadings	*Cronbach Alpha*	Composite Reliability	AVE	*p*
Culture_01	.738	.902	.901	.534	**
Culture_02	.758				**
Culture_03	.721				**
Culture_04	.702				**
Culture_05	.794				**
Culture_06	.695				**
Culture_07	.745				**
Culture_08	.846				**
Finance_1	.813	.784	.765	.581	**
Finance_2	.496				**
Finance_3	.456				**
Finance_4	.731				**
Finance_5	.695				**
Human_Capital_01	.644	.811	.810	.497	**
Human_Capital_02	.691				**
Human_Capital_03	.641				**
Human_Capital_04	.657				**
Human_Capital_05	.590				**
Human_Capital_06	.716				**
Markets_01	.651	.719	.722	.475	**
Markets_02	.573				**
Markets_03	.871				**
Policy_01	.913	.926	.924	.672	**
Policy_03	.822				**
Policy_04	.839				**
Policy_05	.751				**
Policy_06	.779				**
Policy_2	.843				**
S_Finance_1	.608	.670	.673	.482	**
S_Finance_2	.641				**
S_Finance_3	.637				**
S_Finance_4	.496				**
Support_1	.587	.835	.835	.520	**
Support_2	.710				**
Support_3	.726				**
Support_4	.672				**
Support_5	.799				**
Support_6	.620				**

Support_7	.621				**
Support_Professions_1	.677	.825	.825	.487	**
Support_Professions_2	.623				**
Support_Professions_3	.739				**
Support_Professions_4	.685				**
Support_Professions_5	.673				**

Source: Own compilation

Convergent validity is measured through average variance extracted (AVE), common acceptable value of AVE should be >0.50, which indicates more than 50% variance in the indicator, less 0.50 value generally indicates poor convergent validity, however in Table above all constructs have a value very close 0.50 and we have retained these indicators since removal effects the composite reliability of the constructs according to the guidelines given by (Hair *et al.,* 2014).

Table 9: *Discriminant validity (Fornell-Larcker Criterian)*

	Culture	Finance	Human Resource	Market	Policy	Source Finance	Support	Support Profession
Culture	**.770**							
Finance	.283	**.729**						
Human Resource	.455	.249	**.716**					
Market	.320	.293	.310	**.795**				
Policy	.157	.276	.346	.373	**.854**			
Source Finance	.365	.444	.456	.263	.170	**.708**		
Support	.399	.297	.617	.294	.261	.565	**.710**	
Support Profession	.441	.232	.523	.362	.309	.443	.585	**.767**

Source: own compilation

Discriminant validity of the constructs is assessed through the Fornell Larcker Criterion (1981), where the square root of average variance extracted is compared with construct correlations; and generally acceptable range at the diagonal is (0.708) in the table above all value >=0.708, and each constructs exhibit discriminant validity. Another criterion to assess the discriminant validity is the HTMT ratio introduced by Hensler *et al.* (2015) and if the HTMT ratio is smaller 0.85 is regarded that the discriminant validity is established as seen in the figure below:
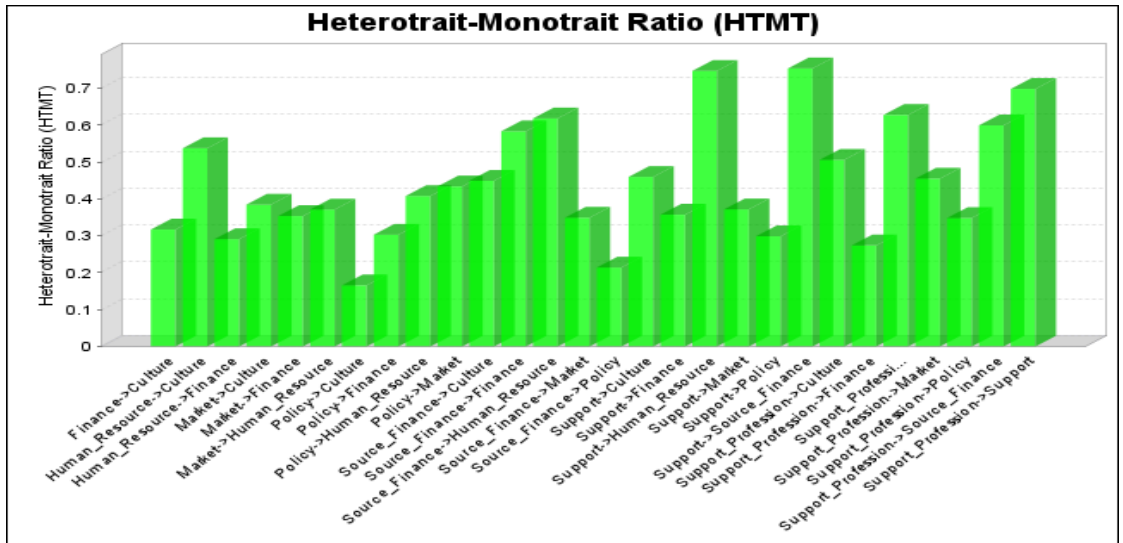
Figure 2: *HTMT Ratio for discriminant validity*

Table 10: *Summary of Fit Indices*

Sample Size	244	Remarks
DF	902	
Chi-Square-Goodness of fit	3997.241	
Chi-Square p value	00.00	<0.05 indicates good fit
Normed Chi-Square	4.431531	Value <5 indicates good fit (Schumacker & Lomax, 2004).
SRMR	0.061	A value less than .08 is generally considered a good fit (Hu & Bentler, 1999).

Source: Own compilation

Discussion

The Entrepreneurial Ecosystem and its success is very important for regional economics. This research adopted entrepreneurial ecosystem scale and incorporated more subdomains in finance and support, exploratory factor analysis and confirmatory factor analysis is used along with CFA using PLS-SEM in SmartPLS show agreement with some except on some values in CFA results done in PLS-SEM in SmartPLS. Finally, goodness fit model was tested through SRMR, chi-square test, and both results are in agreement with the threshold values with some exceptions usually that is what we get when we do CFA for newly developed scale, so the overall conclusion, is that this scale is best suited to be used in the developing country context with larger sample size and will throw light on the policy action points.

The study uses Isebgerg's (2010) model of the entrepreneurial ecosystem in the developing country context; this scale can measure differences between the regions based on the perceptions of the entrepreneurs. This scale can measure the perception of the entrepreneurs of their surrounding entrepreneurial environment that is beneficial for the entire entrepreneurial ecosystem. This scale has also been validated in the context of Pakistan; in this scale, new domains i.e within finance, source of finance and within the support, support professions are introduced and validated through EFA, CFA, and CFA in PLS-SEM in the context of Pakistan. The conclusion is that this scale can be used in different regions, cities, and provinces which can be used to assess weak or strong domains of the entrepreneurial ecosystem and customized policies can be used, for those regions to introduce different policies for each region. Comparing this research with (E. Ligouri *et al.,* 2019) the exploratory factor analysis has revealed two new sub-domains i.e., support finance and support professions, we have used this scale in the developing country context which can give us insight into developing country context i.e., study by (E. Ligouri *et al.,* 2019).

Conclusion

We have used the multi-dimensional scale of the entrepreneurial ecosystem and have extended the scale with more sub-domains in the developing country context, to better understand that how policymakers can use this evidence-based measure to pinpoint areas of improvement to the regional entrepreneurial ecosystem with more vibrant and supportive policies for the entrepreneurs.

Limitations and Future Research Directions

The purpose of this research was to extend the already developed version of the entrepreneurial ecosystem scale, the novelty of this research is that two sub-domains within finance i.e., source of finance and another within support i.e. support professions were used and validated, however, with mixed results. Due to small sample size (n=244) in the context of Pakistan, the future researchers should come up with more sub-domains or any new domain should be introduced like a social network within the entrepreneurial ecosystem.

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