

# The Role of Industrial Parks Entrepreneurial Ecosystem in Strengthening Ventures' Capability: Evidence From Ethiopian Small Manufacturing Enterprises

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## Research

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# Abstract

Small scale enterprises sector has been recognized as an integral component of economic development and it is advisable and indispensable to integrate the enterprises with Industrial parks for sustainable business operation. IPs plays a crucial role in organizing the resources and innovation of manufacturing operation through business advising, infrastructure provision, technology transfer, and R&D support which advances firms' capability. In this sense, the objective of this was to investigate the role IPs entrepreneurial ecosystem towards improving the capability of small ventures. Data were obtained from a sample of 245 small manufacturing enterprise owners selected through simple random sampling and analysed using descriptive, multi-level regression analysis and OLS regression analysis. From this, the presence of better and suitable entrepreneurial ecosystem which consists of provision of training, market information, adequate finance, and government commitment positively contributes for improvement of small firm's capability. Despite of this, the study also found that there are many barriers hindered the development of strong entrepreneurial ecosystem in Ethiopia, such as, human capital, institutional, financial, market, policies and legal procedures, cultural and resource barriers. The entrepreneurial ecosystem influences the resources capability more when academia-industry linkage exists. The OLS regression result also shows that the entrepreneurial skill mediates the influence of entrepreneurial ecosystem on technological capability, while managerial knowledge mediates the influence of entrepreneurial ecosystem on the firm's resource capability. The implication for policymakers is to develop a policy that supports incorporating small firms in industrial parks entrepreneurial ecosystem and link with academia. The study also forwarded a clue for managers of small firms in improving their firms technological and resource capabilities through building managerial knowledge and entrepreneurial skills.

## 1. Introduction

### 1.1. Background of the study

One can think of capabilities as the efficiency with which a firm uses the inputs available to it, and converts them into whatever output(s) it desires (Dutta *et al.*, 2005). It's the firm's processes that use resources - specifically the processes to integrate, reconfigure, gain and release resources - to match or even create market change (Eisenhardt & Martin, 2000). Firm capability includes factors that enhance small business' awareness of strategic prospects/threat and its ability to undertake strategies (Kamasak, 2017). Firms capability can be considered as organizational capabilities embedded in firm routines (Collis, 1994) and associated with Managerial capabilities and leadership (Paraschiv *et al.*, 2012), technological capabilities (Lee & Rhee, 2007), efficiency (Dutta *et al.*, 2005), and firms' resources (Portillo-Tarragona *et al.*, 2018).

In relation to entrepreneurial ecosystem, capabilities can be a source of competitive advantage because they decisively determine the acquisition, development, and deployment of the rest of the resources and capabilities (Camisón *et al.*, 2018). This resource are a set of knowledge, skill, experience, and ability to

select technologies, set up, operate, assimilate, sustain, advance, and extend new values to the processes and products in a dynamically changing manufacturing environment (Ahmad et al., 2014). For instance, human capital plays a crucial role in developing and maintaining the capabilities of a company (Costa *et al.*, 2019). The key to sustainable entrepreneurship lies in the specific combinations of the elements in an entrepreneurial ecosystem (Isenberg, 2011). Entrepreneurial ecosystems is a combinations of social, political, economic, and cultural elements with a supportive platform of creation and growth of enterprises (Miriam & Flores, 2018). Nieves and Haller (2014), therefore, consider it a fundamental resource for a series of essential capabilities to be realized (Costa *et al.*, 2019).

Ethiopia is envisaging being an industrial and a middle income country by 2025, and high income country within the next four to five decades. And later on, it has formulated GTP I and GTP II. The first Growth and Transformation Plan (GTP – I) is ended. The next GTP – II is underway, which focused, among other, to transform its economy from agricultural-led to industrial-led economy (Weldesilassie *et al.*, 2017). Therefore, with the support of appropriate entrepreneurial ecosystem, industrial parks will continue to change with the economy around them and will remain an important tool for integrating indigenous and foreign investment together to create the linkages that stimulate industrial and economic development (Isenberg, 2010; Brennan, 2012; World Economic Forum, 2013, Spigel, 2015; Mariam and Flores, 2018). Moreover, Ethiopia is building industrial parks with associated basic infrastructures to attract investment in the manufacturing sector (EIC, 2017).

In this practice, the government provides a number of incentives to firms located in the industrial parks with envisaging to establish additional industrial parks across economic corridors of the country (MoFED, 2017). Furthermore, it is also recognized that the importance of linkage of higher education institutions with small firms for a given country is crucial. Experience demonstrates that a mutual integration between university and industry can foster the development of the communities in which both are operating (Yilma & Alemu, 2018).

Firms at the global level are facing many challenges in the forms of market uncertainty, human and financial capital and increase in both local and international competitors (Raghuvanshi and Garg, 2018; Al Mamun, 2019). Besides, the firm-level capabilities can be difficult to imitate because these systems involve routines that are firm-specific, socially complex, and path-dependent (Kor & Leblebici, 2005; Harris, *et al.*, 2013). Therefore, there is a necessity for industrial parks entrepreneurial ecosystem development towards improvement of small firm's capability. Improvement in small enterprises capability can be highly impacted by several factors, among these the crucial ones are the entrepreneurial ecosystem, academia-industry linkage, managerial knowledge and entrepreneurial skill. Unfortunately, these variables remain understudied in developing countries. Even though, these evidences are obtained from other countries the researchers cannot access similar evidences in Ethiopia.

One of the problem we have been witnessing is that small firms are isolated from the industrial parks due to limited finance, experience in an industry/manufacturing centres, operations scale, improper policy, and so forth. On the other hand, Yilma & Alemu (2018) research outcome revealed that the linkage

between universities and industries seems to be very weak particularly in developing countries. We also identified that the practice of academia-industry linkage (AIL) is very weak in Ethiopia, even if the institution that coordinate this issue is established in public universities. With this challenges, increasing the number of high growth and capable firms is now a major focus for industry policy. However, existing approaches are proving ineffectiveness (Mason & Brown, 2014).

Theoretically, the relationship between industrial parks entrepreneurial ecosystem, firms capability and academia-industry linkage which forgotten by previous studies was researched in this study. Therefore, this study is aimed at investigating the entrepreneurial ecosystem in industrial parks in strengthening the capability of small venture. The study further tests the role of academia-industry linkage, managerial knowledge, and entrepreneurship skill on the relationship between industrial parks entrepreneurial ecosystem and improvement in ventures capability. Besides, there are many studies that studied the influence of firm capability on competitive advantage (eg. Baum & Locke, 2004; Gerli *et al.*, 2011; Al Mamun, 2019) and performance (Tuan & Yoshi 2010; Ismail *et al.*, 2012; Sanchez, 2011; Barney & Arian, 2001; Zahra *et al.*, 2006; Vijay & Ajay, 2011; Weinstein and Azoulay, 1999; Eikelenboom, 2005; Kamasak, 2017). Moreover, there is a lack of studies that identifies the building block of firm capability. Besides, before going further relationship with competitive advantage and performance, we found the necessity to test the role of managerial knowledge and entrepreneurial skills on building and improving firms capability. Therefore this study revealed the determining factors of firm's capability and the role of managerial knowledge and entrepreneurial skill. Therefore, this study is aimed at investigating the industrial parks entrepreneurial ecosystem on firms capability improvement, with a specific role of AIL, managerial knowledge, and managerial skill.

## 2. Theory And Hypothesis

### 2.1. Entrepreneurial Ecosystem in Industrial Parks

Industrial parks are planned and developed with provision of the physical infrastructure for the use of enterprises (Regional Conference on Industrial Parks, 2012), in order to accomplish the innovation capability and the R&D support of small and medium-sized enterprises (SMEs) (Park, 2016). In industrial park, buyers, producers, and suppliers can operate in the same location, thus cutting the transaction costs of economic learning while establishing new standards and norms of entrepreneurial behavior (Regional Conference on Industrial Parks, 2012). Since the SMEs have the limitations of manpower and resources, it is difficult for them to search for the promising fields autonomously (Park, 2016). Therefore, the formation of industrial parks has unquestionably built a better entrepreneurial ecosystem. Besides, entrepreneurial ecosystems have similarities with industrial districts, clusters, and innovation systems; entrepreneurs and spin-offs are present in these other frameworks but are not central as they are in entrepreneurial ecosystems (Stam & Spigel, 2017).

Entrepreneurial Ecosystem is a set of interconnected entrepreneurial actors, entrepreneurial organisations, institutions and entrepreneurial processes which formally and informally coalesce to connect, mediate

and govern the performance within the local entrepreneurial environment (Andrews, 2014). Acs *et al.*, (2017) accordingly identified entrepreneurial ecosystems as having developed from literatures in both business strategy and regional development.

## **2.2. Firms Capability**

Capabilities represent the ability of the firm to combine efficiently a number of resources to engage in productive activity and attain a certain objective (Amit and Schoemaker, 1993; Collis, 1994). This reasoning suggests that capabilities are clearly an 'intermediate transformation ability' between resources and objectives (Dutta *et al.*, 2005). Teece & Pisano, (1994) argue that it's the subset of the competences/capabilities which allow the firm to create new products and processes and respond to changing market circumstances, while, Eisenhardt & Martin, (2000) stated that It's the firm's processes that use resources - specifically the processes to integrate, reconfigure, gain and release resources - to match or even create market change. In general capabilities are a unique combinations of organizational processes that collate strategic knowledge and lead to better firm performance (Ketata. 2014).

A successful large corporation derives competitive strength from its excellence in a small number of capabilities clusters (Dosi, Nelson & Winter, 2000), which might be useful for small firms too. Firms capability can be considered as Organizational capabilities embedded in firm routines (Collis, 1994) and associated with managerial capabilities (Paraschiv *et al.*, 2012), Technological capabilities (Lee & Rhee, 2007), efficiency (Collis, 1994; Dutta *et al.*, 2005), product delivery (Haeussler *et al.*, 2010; Zheng *et al.*, 2009; Camisón-Haba *et al.*, 2018) and firms' resources (Portillo-Tarragona *et al.*, 2018). Therefore, the firm's capability improvement may include technological capabilities, firm's resource capabilities marketing capabilities and etc. For instance, organizational capability that can confer to the firm ability to adopt industrial innovations, is a technological capabilities (Bustinza *et al.*, 2019).

Technological capabilities are fundamental for companies to acquire competitive advantage (Burgelman *et al.*, 2004; Antonio *et al.*, 2018). They exist within the context of additional organizational capabilities which help organizations and the individuals within them, to respond better when faced with challenges (Bustinza *et al.*, 2019). Moreover, through technological capabilities, firms are able to successfully adopt technology that enables them to implement new techniques of production and in turn solve problems arising from the use of outdated production systems (Chen *et al.*, 2014; Shin *et al.*, 2012; Bustinza *et al.*, 2019). On the other side, an in-depth analysis of the projects revealed a clear relation between the firms' resources and capabilities (Portillo-Tarragona *et al.*, 2018). Capabilities are considered as a "superior" resource because of "their capacity to deploy resources, usually in combination, using organizational processes, to effect a desired end" (Fainshmidt *et al.*, 2016; Kamasak, 2017).

## **2.3. The role of IPs entrepreneurial ecosystem on firms capability improvement**

Micro and small enterprises, as the drivers of indigenous entrepreneurship, play a key role in developing the global economy by improving technological capability building, diffusion of innovations and capital

mobilization (Nabiswa and Mukwa, 2017). There is also a belief that IPs could play a positive role in economic development (Wei & Xie, 2000), through improving small firms capability. That is, improved SME competitiveness (influenced by firm's capability) could obviously contribute to economic and social development and poverty reduction (OECD, 2004). More specifically, by clustering in to industrial parks, small, medium and even large enterprises can take advantage of improving capabilities obtained from public infrastructures, economize on construction and common facilities, and gain access to nearby skilled labour markets, research and educational facilities and other critical inputs (Falcke, 1999). Industrial park also encourage and help SME to participate effectively in national dialogues that help set the strategic frameworks for development (OECD, 2004); provide an institutional framework, modern services and a physical infrastructure (Regional Conference on Industrial Parks, 2012); and enhance relationships between different actors (Regional Conference on Industrial Parks, 2012), which can improve the capability of small firms. From this, we proposed that;

*H1: As IPs entrepreneurial ecosystem becomes better, the better firms' capability.*

## **2.4. The moderating role of UIL**

Collaborative capabilities have been considered significant by several authors; because of these capabilities, firms actively collaborate with research institutes, agencies and universities (Portillo-Tarragona *et al.*, 2018). Like a cluster, an entrepreneurial ecosystem also involves as key actors of several other entities, including large firms, universities, financial firms, and public organizations that support new and growing firms (Brown & Mason, 2017). Therefore, the interaction of academia with industry provides consultancy, joint research & development or training (D'Este and Patel, 2007; Martin, 2000; Lesjak, 2012; Kökocak, 2006), incubation centres (Brennan, 2012), flow of knowledge and technology amongst universities, (Lesjak, 2012), collaboration development & techno-parks (Kökocak, 2006), and technology transfer offices (Kiziltaş, 2009). Parks are thus a useful tool to establish value added links between academic research and industry (Regional Conference on Industrial Parks, 2012). Understanding the nature of relationships between academic institutions and SMEs is therefore important, in view of the fact that concentrations of SMEs in certain regions, clustered around one or more university centres, can be effective locations for accelerating this process (Hendry *et al.*, n.d ).

Companies may obtain innovation-related knowledge and technologies from academic institutions through engaging in academia-industry linkages (Bozeman, 2000; Feldman *et al.*, 2002; D'Este and Patel, 2007) (Liu, 2009). Theoretically, the more that related firms cluster together, the lower the cost of production, and the greater the market in which the firms can sell (Hu *et al.*, 2011). The study of Gulbrandsen & Solesvik, (2015) provides insights into how different universities with different resource endowments and knowledge bases identify, pursue and exploit opportunities related to cooperation with firms from their industrial clusters which can provide access to essential resources, competencies, knowledge and legitimacy. It is widely recognized that universities and other public research institutions play a central role within systems of innovation for basic research generation, technology transfer and knowledge diffusion to firms (Daniel A. and Andreea F, 2017; Bercovitz and Feldman, 2006; Hall *et al.*, 2000; Mowery and Sampat 2005; Mowery and Shane 2002; Thursby and Thursby, 2011; Filippetti &

Savona, 2017). The knowledge created through research can solve the industrial problems (Etzkowitz and Leydesdorff, 1997). Therefore, the development of industrial links with academia can promote the innovation and the production (Westhead and Storey, 1994) (Bhutto & Lohana, 2018). Several studies proved the growth of those companies which have strong linkages with academia in comparison to those which do not have such linkages (Malairaja and Zawdie, 2008) (Bhutto & Lohana, 2018). Therefore, we hypothesized that;

*H2: The existence of academia-industry linkage in industrial parks intensifies the influence of IPs entrepreneurial ecosystem on the improvement of small firm's capability.*

## **2.5. The role of entrepreneurship skill**

Capabilities are predominantly viewed as the most important skills that underpin the development and deployment of resource (Molloy and Barney, 2015). Particularly, Teece, (2012) stated that as entrepreneurial skills encompass sensing, seizing and transforming, they are essential traits to develop dynamic capabilities. Capabilities include specific aspects including the ability of a firm to develop organizational systems that emphasize the development of skills (Camisón *et al.*, 2018). As suggested by Phelan and Sharpley (2012), entrepreneurs require various skills to develop specific competencies to manage an enterprise. Basically, entrepreneurs have to learn a set of skills (Kutzhanova *et al.*, 2009) from the entrepreneurial ecosystem and allow an individual to update his or her beliefs about entrepreneurial aptitude (Entrialgo and Iglesias, 2016). Then, this entrepreneurial skills foster individuals to feel competent and venture into entrepreneurship (Scherer *et al.*, 1991; Al Mamun, 2019). The implication is that small businesses need to effectively utilize their organizational capabilities such as managerial systems, employee knowledge and skills, values and norms (Eikelenboom, 2005; Kamasak, 2017).

Particularly, technological capability is an expression used to encompass the system of activities, physical systems, skills and knowledge bases, managerial systems of learning and incentive, and values that generate an extraordinary benefit for a company (Ahmad *et al.*, 2014). Besides, RBV was applied to explain the benefits of entrepreneurial competencies on entrepreneurial skills as practices and know-how instigate unique capabilities in the organization (Barney, 1991; Grant, 1991; Al Mamun, 2019). The RBV theory reveals that businesses have resources, skills and knowledge that are different among firms (Barney, 2001; Kamasak, 2017), which developed from the organized entrepreneurial ecosystem. Therefore,

*H3: The entrepreneurial skill mediates the relationship between IPs entrepreneurial ecosystem and small firm's capability improvement.*

## **2.6. The role of Managerial knowledge**

Following Koontz's (1964) definition of managing, it can be adduced that managerial knowledge may be defined as knowledge regarding 'the art of getting things done through or/and with people' (Bosch and Van Wijk, 2000). Managerial capabilities are derived from activities involving the tacit knowledge deposited in managers (Camisón *et al.*, 2018). Knowledge-based resources such as innovation capability,

marketing capabilities and different production capabilities are vital firm resources (Calantone *et al.*, 2002; Rangone, 1999; Kamasak, 2017). One of the most relevant is the absorptive capacity, which is the ability to take in external knowledge and use it for commercial purposes (Zahra & George, 2002; Costa *et al.*, 2019). In explaining the rent generating capacity of top management as necessary to the emergence of cultural resources and organizational capabilities, Castanias and Helfat (1991) employ Katz's (1955) classification to discern the different skills of a manager (Bosch and Van Wijk, 2000).

Particularly, technological capabilities are a knowledge-based comprehensive set of organizational capabilities that enable a firm to search, recognize, organize, apply and commercialize innovative products and services (Chang *et al.*, 2012; Bustinza *et al.*, 2019). This implies that technological capabilities requires managerial knowledge. That is, the knowledge of managers create capabilities to gain competitive advantage (Lengnick-Hall & Lengnick Hall, 2003; Costa *et al.*, 2019). Besides, it can be argued the knowledge components of managerial knowledge are constituted by know-what, know-how, know-why, know-who, know-where, and know-when (Bosch and Van Wijk, 2000).

For a firm to gain superiority requires that top management possess a broad set of complementary skills. A single person, however talented, is unlikely to possess all the managerial skills that are required for the successful operation of a large organization (Carmeli and Tishler, 2004). But, as managers are different from each other, they will have different knowledge bases, which may lead them to make different decisions (Adner & Helfat, 2003; Marimuthu & Kolandaisamy, 2009). That is, a range of managerial skills enables a firm to deploy specific skills to cope with specific situations. Mahoney (1995) pointed out that 'the attributes of the management team may satisfy the conditions for achieving and maintaining competitive advantage (Carmeli and Tishler, 2004). However, before the competitive advantage there must be an improvement in the firm's capability from the managerial knowledge which developed from the good environment of entrepreneurial ecosystem.

*H4: The managerial knowledge mediates the relationship between IPs entrepreneurial ecosystem and small firm's resource capability improvement.*

## **3. Methodology**

### **3.1. Research Design**

The design of the study was both Descriptive and causal. It mainly aims at describing the existing situation in the integration between small business enterprises and industrial parks. It also explains what factors determine small firm's capacity improvement. In top of this, the study has formulated a functional framework for industrial parks entrepreneurial ecosystem and firm's capability improvement.

### **3.2. Sampling Techniques and Sample size determination**

The population of this study were from small manufacturing firms in Ethiopia. According to Addis Ababa city administration micro and small scale enterprise development office (AAMSSEDO) (2018), there are

8697 micro and small manufacturing enterprises in the city. Total 269 + (10% contingency) approximately= 326 samples were taken and the same number of questionnaires were distributed. Concerning the sampling size, Yamané's formula was adopted to determine the sample size for this study. Out of these 245 (82.77% of 326) and 75.15% of 326, were completely filled and returned to the researchers. Thus, the analysis of questionnaire was done based on these data.

Simple random sampling technique was found appropriate for this study (to gather data through questionnaire). The reason to adopt SRS was nature of the target population, the population was small manufacturing firms' owners. This technique offer equal participation for each element.

### **3.3. Measurement**

Various authors related firm's capability from various perspectives. For instance, (Collis, 1994; Murray & Chao, 2005; Ruiz-Ortega & García-Villaverde, 2008; Kaufmann & Roesch, 2012; Costa *et al.*, 2019; Sánchez, 2011; Kamasak, 2017; Dutta *et al.*, 2005 Portillo-Tarragona *et al.*, 2018) associated with efficient use of resources. Other authors such as Lee & Rhee, (2007); Burgelman *et al.* (2004); Vitorino *et al.*, 2018); and Bustinza *et al.*, (2019) considers technological capabilities, while Haeussler *et al.*, 2010; Zheng *et al.*, 2009; Camisón-Haba *et al.*, 2018) associated with product delivery. For this study, particularly we have focused on the technological and firm resources capability. Accordingly, we asked the respondents to rate the level of their firm's resources and technological capabilities on the five-point Likert scale.

Despite its popularity, there is not yet a widely shared definition of entrepreneurial ecosystems amongst researchers. However, Isenberg identifies six domains with entrepreneurial ecosystem such as a conducive culture, enabling policies and leadership, availability of appropriate finance, quality human capital, venture friendly markets for products, and a range of institutional supports (Isenberg, 2011). Besides, the question of the level at which entrepreneurial ecosystem operate has not been answered yet. This would depend on the spatial scale on which the elements are achieved, on the one hand, and how they are limited, on the other hand (Stam & Bosma, 2015). From the various discussion made on the issue previously, seven items associated with the above domains were developed and asked to be rated on the five point Likert scale compared to the entrepreneurial ecosystem of the industrial parks. These items particularly contain questions related to infrastructure, government support, market access, access to human capital, reputation, risk minimization, and access to resources.

The academia industry linkage has measure with multi-item questionnaire in most researches. In this study the purpose of measurement is related with whether the academia-industry linkage intensifies the relationship between the entrepreneurial ecosystem and firms capability. Therefore, we developed a single item that asks respondents to rate the level of linkage with academic institutions. Similarly, the entrepreneurial skill and managerial knowledge were also asked to rate on the five point Likert scale.

### **3.4. Data quality assurance and analysis**

The primary data's collected using questionnaire were coded and entered to SPSS software for analysis. The collected data's were then analysed using SPSS Version 24, which was used to analyse descriptive

and hierarchical regression analysis. OLS regression analysis were undertaken to show the moderating impact of academia-industry-linkage, managerial knowledge, and entrepreneurial skill. To achieve this objective, a four stage hierarchical regression analysis was undertaken. In the first stage controlling variables were included. Next, the main effect and the moderators were added and lastly, the interaction variables of main effects and moderators were added to the analysis. The ANOVA result shows that the model was fitted significantly in all the four models. Finally, based on the outcome, discussion and interpretation were performed by the researchers.

The measurement instruments are tested for validity and reliability before analysis were made for completeness and compatibility with the purpose of the study. Their reliability and validity of the data was tested. To ensure validity a pilot study was undertaken and for the test reliability, Cronbach's Alpha test was used. Accordingly, the Cronbach's alpha test was more for all items. With this, we can say that questionnaires were reliable enough. Moreover, by looking to the tolerance and VIF level, we confirmed that multicollinearity is not a concern, since all tolerance values are above .1 and VIF are less than 5.

## **4. Results And Discussion**

### **4.1. The entrepreneurial ecosystem**

By looking to other countries experience such as China, Malaysia and Singapore, entrepreneurial ecosystem in Industrial parks requires a strong government commitment, formulating functional procedures and legislations, providing social facilities, building cheap industrial sites (Stam, 2016). Similarly in order to enhance entrepreneurial ecosystem, it needs government focus in various area such as capacity building of local companies and integrate firms with universities (Spigel, 2015; Stam, 2016 and Brown & Mason, 2017). From the empirical study conducted, the descriptive study result (Table 4.1) revealed that all mean score, except for sectors are > 3.3 and the standard deviation of all items, except for sector, size, and entrepreneurial skill are less than 1. That is a low standard deviation indicates that the data points tend to be very close to the mean. The mean values indicate low level of capabilities, managerial knowledge, entrepreneurial skills, industrial parks entrepreneurial ecosystem, and linkage with academia.

The highest correlation result is between is ( $\beta = .491, p < .05$ ) (Table 1) between industrial parks entrepreneurial ecosystem and firms technological capability. The dependent variable firm's technological capability improvement is significantly correlated with independent variables such as types of industry or their sector, industrial parks entrepreneurial ecosystem and entrepreneurial managerial knowledge. Similarly, firm's resource capability improvement is significantly correlated with firm's size and industrial parks entrepreneurial ecosystem.

Table 1  
Descriptive statistics result

	Mean (S.D.)	1	2	3	4	5	6	7	8
<b>Tech.Cap</b>	3.382(.6777)	1							
<b>Res.Cap.</b>	3.355(.6377)	-.184**	1						
<b>Sectors</b>	2.810(1.484)	.177**	.033	1					
<b>Size</b>	4.400(2.105)	-.010	.251**	-.438**	1				
<b>IPEE</b>	3.487(.4682)	.491**	-.186**	.141*	.254**	1			
<b>AIL</b>	3.369(.5212)	-.060	-.039	.142*	.050	-.005	1		
<b>Mgt.Know</b>	3.510(.8853)	-.165**	-.058	-.354**	.142	-.130*	-.174**	1	
<b>Ent.Skill</b>	3.402(1.140)	-.059	-.072	-.047	.008	-.018	.118	.406**	1

Source: SPSS Computation, 2020

## 4.2. Entrepreneurial ecosystem and small ventures capability improvement

The results from Table 2 indicates that when technological capability is a dependent variable, in the first model the controls alone explains the improvement in firms capability is nothing, however it explains about 32.1% after all the variables.

Table 2  
Regression coefficient (Multi-level regression analysis)

Dependent variable	Model	R <sup>2</sup> (F)	Sec	Size	IPEE	AIL	EE*AIL
Technological capability	1	R <sup>2</sup> =.000 F=.024	-.009 (.047)	-.006 (.034)			
	2	R <sup>2</sup> =.312 F=17.095***	-.078* (.040)	-.078** (.030)	-.809*** (.113)		
	3	R <sup>2</sup> =.321 F=13.21***	-.062 (.042)	-.070** (.031)	-.789*** (.114)	-.157 (.133)	
	4	R <sup>2</sup> =.321 F=10.474***	-.062 (.043)	-.070** (.031)	-.800 (.542)	-.135 (.445)	-.006 (.286)
Resource capability	1	R <sup>2</sup> =.063 F=3.825**	.070 (.038)	.070** (.028)			
	2	R <sup>2</sup> =.225 F=10.923***	.046* (.035)	.113*** (.027)	-.485*** (.100)		
	3	R <sup>2</sup> =.226 F=8.162***	.050 (.038)	.115*** (.027)	-.491*** (.101)	-.043 (.118)	
	4	R <sup>2</sup> =.389 F=14.111***	.068** (.034)	.134*** (.025)	-2.767*** (.428)	-4.526*** (.831)	1.230*** (.226)

*Source: SPSS Computation 2020*

*Standard error in bracket*

Similarly, when firm's resource capability is a dependent variable, the R-square value is about 39% in the fourth model. The interaction between entrepreneurial ecosystem and academia-industry linkage has no impact on the technology capability improvement, while there is significant influence on the resource capability improvement.

The improvement of industrial parks entrepreneurial ecosystem was measured in terms of infrastructure, government support, market opportunity, pool of human capital, reputation, minimum risk, and access to other resources. The improvement in these factors in general will lead to improvement in these firm's capability. Entrepreneurial ecosystem creates opportunities for firms to improve their capability, however

the specific cause of ventures capability development has not been clearly delimited. Governments, industrial park developers and resident firms in Ethiopia experience multi-faceted challenges, such as complications associated with administrative and regulatory capacity building, coordinating key actors and stakeholders, infrastructure and public utility provision, financing issues, skills development, and linkages with local economies (UNIDO, 2018). These challenges has weakened the contribution of entrepreneurial ecosystem on the various aspects of small ventures capability improvement. Sadly, IPs are not open for small firms even in their strategic plan.

Consistently, the World Economic Forum (2013) study, for example, concludes that access to markets, human capital and finance are most important for the growth of entrepreneurial companies. But these can best be seen as superficial perquisites, not as the fundamental causes for the success of ecosystems - for human resources and finance are, after all, largely dependent on the underlying institutions regarding education and financial markets (Acemoglu et al., 2005). If these factors was not sufficiently accessed, it has negative effect on the growth of building good entrepreneurial ecosystem.

### **4.3. The role of academia-industry linkage**

Small firms perceived that joining widen scope of business environment (IPs) enhances business operations and capability. Currently, integrating higher educations with small firms and incorporating small firms in IPs are not well exercised or implemented. Practically, the current Ethiopia's industrial policy reform more emphasize on strong linkage between industry and agriculture; not industry and university (Alebel, 2017). Academic institutions as innovation partners are found to be especially important for R&D intensive industries and for industries whose technological development is rapid (Cohen et al., 2002; Scharinger et al., 2002) (Liu, 2009). As shown by countries such as the United States, innovation and business competitiveness are greatly enhanced through the activities of research universities (Panarina, n.d).

Even though the practice of AIL is poor in low-income economy, there is a strong contribution to the improvement of industrial parks entrepreneurial ecosystem. The concentration of small firms around clusters and centres will have an opportunity to access infrastructures and services that improve entrepreneurial ecosystem. The industrial clusters provides access to essential resources, competencies, knowledge and legitimacy (Gulbrandsen & Solesvik, 2015). In improving these resources, an AIL plays a crucial role in regard to improving the industrial parks entrepreneurial ecosystem. Particularly, academic institutions offer small firms knowledge and technologies used for innovation (Bozeman, 2000; Feldman et al., 2002; D'Este and Patel, 2007; Liu, 2009), pursue and exploit opportunities related to cooperation with firms from their industrial clusters (Gulbrandsen & Solesvik, 2015), gain access to the resource base (e.g., unique equipment, labs, software, etc.) (Prause & Solesvik, 2011; Solesvik, 2011; Solesvik & Gulbrandsen, 2013, 2014), knowledge owned by university (Fritsch & Schwirten, 1999) (Gulbrandsen & Solesvik, 2015), solve the industrial problems (Etzkowitz and Leydesdorff, 1997), improves knowledge infrastructure (Rutten, Boekema, & Kuijpers, 2003) (Gulbrandsen & Solesvik, 2015), and enriched with innovation capabilities (Liu, 2009). In support to the above findings, our finding shows that there is a

significant moderation from academia-industry linkage on the relationship between entrepreneurial ecosystem and firm's capability (i.e. resources) improvement.

Interesting arguments about the positive impact of industrial linkages can also be found in a sizable number of empirical studies on industrial clustering (Hu et al., 2011). That is, as we make universities entrepreneurially oriented, the universities and industries build good entrepreneurial ecosystem that supports the firms to improve their capability. At the firm-level scale, many other scholars have accepted the notion that linkage benefits derived from cluster occupancy lead to superior firm performance (Debaere, Lee, and Paik 2009) (Hu et al., 2011), and contribute towards improved industrial competitiveness (Quintas et al., 1992; Vedovello, 1997), embrace social and economic impact more at large (Filippetti & Savona, 2017), and promote the innovation and the production (Westhead and Storey, 1994) (Bhutto & Lohana, 2018). All this improvements has been associated with the development and improvement of small firm's capability. This progress will be recorded with the improvement in the firm's capability. Consistently, the presence of academia-industry-linkage contributes for the improvement of small firm's technological capability.

## **4.4. The role of entrepreneurial skills and managerial knowledge**

The government should encourage small firms and provide support in utilizing the skills and competencies of small manufacturing sectors to improve their capability. In terms of the relevance of entrepreneurial skill, Camisón *et al.* (2009) also indicate that organizational systems emphasize the development of skills, and the degree to which the members of the organization are committed to the goals of the firm and knowledge.

Table 3  
Regression coefficient (OLS regression analysis)

		Technological capability		Resource capability	
		Coefficients	T	Coefficients	T
		B(Std. Error)		B(Std. Error)	
<b>Path 1</b>	<b>DV: Technological capability</b>			<b>DV: Resource Capability</b>	
	R= .491 R <sup>2</sup> = .241 Sig.=000			R= .186 R <sup>2</sup> = .035 Sig.=003	
	(Constant)	.902	3.169***	4.238	14.034***
	EPEE	.711	8.796***	-.253	-2.951***
<b>Path 2</b>	<b>DV: Entr, Skill</b>			<b>DV: Man. Knowledge</b>	
	R=.018 R <sup>2</sup> = .000 Sig.=.774			R=.130 R <sup>2</sup> = .017 Sig.=042	
	(Constant)	3.565	6.488***	4.367	10.322
	IPEE	-.045	-.288	-.246	-2.043**
<b>Path 3</b>	<b>DV: Technological capability</b>			<b>DV: Resource capability</b>	
	R=.494 R <sup>2</sup> = .244 Sig.=.000			R=.204 R <sup>2</sup> = .042 Sig.=006	
	(Constant	1.254	3.269***	4.503	12.451***
	<i>IPEE</i>	.710	8.508***	-.268	-3.102***
	Ent. Skill	-.030	-.897	-	-
	Man. Knowledge	-	-	-.061	-1.324
<b>Total effect</b>	<b>IPEE*Ent.Skill</b>			<b>IPEE*Man.Knowledge</b>	
	IPEE*Ent.Skill	.003		-	
	IPEE*Man.Know	-		.007	

*Source: SPSS Computation, 2020*

Many of the previous studies focuses on looking the impact of entrepreneurial skills on competitive advantage and firm's performance. For instance, there are scholars who argue that Entrepreneurial skills are essential for determining the use of resources to achieve competitive advantages (Kim *et al.* (2011). Others argue entrepreneurial skills can contribute further to enterprise performance, growth and profitability (Lerner and Almor, 2002; Mitchelmore and Rowley, 2010; Al Mamun, 2019). However, there are

studies which focused on the specific contribution. Example, entrepreneurial skills fosters individuals to feel competent and venture into entrepreneurship (Schereret *et al.*, 1991; Al Mamun, 2019). Teece, (2012) also indicates that as entrepreneurial skills encompass sensing, seizing and transforming, they are essential traits to develop dynamic capabilities. Consistently we found that entrepreneurial skill influences the firm's technological capability and mediates the influence of entrepreneurial ecosystem on technological capability improvement.

In small business entrepreneurship research, other scholars linked entrepreneurial skills with demographic, psychological and behavioural characteristics and technical know-how (Gerli *et al.*, 2011; Mitchelmore and Rowley, 2010; Al Mamun, 2019). This study also revealed that, entrepreneurs necessitated a skill that will improve the capability of small firms. These capabilities are developed from the entrepreneurial ecosystem domain of cultural, policies, finance, human capital, friendly markets and etc aspects. This skill that emanate from this ecosystem helps to build and develop both technological capability. More specifically, the entrepreneurial competencies in industrial parks entrepreneurial ecosystem plays a role on the development of entrepreneurial skill, which in turn instigates technological capabilities. Through this skill, a set of activities and processes were developed and contributes for firm's capability improvement.

As several studies indicates, the knowledge-based resources are associated with innovation capability, marketing capabilities and different production capabilities which are vital firm resources (Calantone *et al.*, 2002; Kamasak, 2017). Managers should also be equipped with the knowledge required to build these and other capabilities. However, there is a necessity to view how separately the managerial knowledge improves the resources capability. Even though there is no studies directly tested the role of entrepreneurial ecosystem through managerial skill on improving firms capability was not identified, Morgan, *et al.*, 2003) argue that knowledge creates the most strategically significant resources (Costa *et al.*, 2019). Mahoney (1995) also stated that 'the attributes of the management team may satisfy the conditions for achieving and maintaining competitive advantage' (Carmeli & Tishler, 2004). However, before going further relationship with competitive advantage, we found the necessity to test the role of managerial knowledge on building and/or improving firms capability. Accordingly, resource capabilities necessitated the appropriate managerial knowledge of planning, organizing, directing and controlling. This knowledge enables managers to examine the 5Ws (what, when, why, who, and where), organize, and execute the activities to be performed. By performing these activities properly, managers build and develop and build a firm resource capability.

## **5. Conclusion And Implications**

### **5.1. Conclusion**

The entrepreneurial ecosystem requires a strong government commitment in various area of incorporating small and local enterprises through linking to academic institutions. However, many barriers hindered the development of strong entrepreneurial ecosystem in Ethiopia, such as, human

capital, institutional, financial, market, policies and legal procedures, cultural and resource barriers. Similarly, awareness about academia-industry linkage is not sufficient among small enterprise owners. But, it's believed that operating business in industrial parks improves the small firms capability (both technological and resources capabilities). That is, the presence of better and suitable entrepreneurial ecosystem including availability of training, market information, adequate finance, and government commitment contributes for the improvement of firm's capability. Moreover, the entrepreneurial ecosystem influences the resources capability more when academia-industry linkage was existed. Moreover, the entrepreneurial skill mediates the influence of entrepreneurial ecosystem on technological capability, while managerial knowledge mediates the influence of entrepreneurial ecosystem on the firm's resource capability.

## Contributions

Theoretically, a successful improvement of firm's capability requires the combination of various activities related to the entrepreneurial ecosystem. However, the foundations for these capability improvement and the contribution from the skills, knowledge's and linkages to industrial parks entrepreneurial ecosystem were theoretical not linked. Particularly, the integrated effect of linkages and entrepreneurial ecosystem on the firm's capability improvement were under researched. Therefore, it's crucial to link this variables and test the direct and indirect effect of entrepreneurial ecosystem on the firm capability improvement. Particularly, this study provides the following empirically driven theoretical contributions.

First, the RBV and other existing researches indicated that entrepreneurial skills facilitated microenterprise performance (Baum and Locke, 2004; Barney, 1991; Gerliet *et al.*, 2011; Grant, 1991; Narver and Slater, 1990; Al Mamun, 2019). Several empirical studies also show that there is a significant relationship between a firm's capabilities and its performance ((Tuan and Yoshi 2010; Ismail *et al.*, 2012; Sanchez, 2011; Barney & Arikan, 2001: Zahra et al., 2006; Vijay & Ajay, 2011: Weinstein and Azoulay, 1999; Eikelenboom, 2005; Kamasak, 2017). All the above findings were considered firms capability as predictor. However, there is a necessity to study the building block and determinants of firm's capability, which are underestimated in the previous studies. Therefore, this study identifies this forgotten area and tests the various predictors of firms capability such as; entrepreneurial ecosystem, entrepreneurial skill, and managerial knowledge.

Second, firm's capability can be viewed from various perspectives. For instance, a firm's capability viewed as actions, processes, systems and relationships that the company can carry out with its own resources (Sánchez, 2011). It's also viewed as a company's abilities to combine, develop, and exploit resources to create competitive advantage (Murray & Chao, 2005; Ruiz-Ortega & García-Villaverde, 2008; Kaufmann & Roesch, 2012). This is a general view of firm's capability. Particularly, others scholars associated firms capability with efficiency (Weinstein & Azoulay, 1999), human capital, networking abilities and business processes (Kamasak, 2017), and product delivery (Haeussler et al., 2010; Zheng et al., 2009; Camisón *et al.*, 2018). Beyond these findings, in this study we have identified the specific association of the entrepreneurial ecosystem and other variables with the technological and firm resource capabilities independently.

Finally, even though knowledge-based resources are associated with innovation capability, marketing capabilities and different production capabilities which are vital firm resources (Calantone *et al.*, 2002) (Kamasak, 2017), there is a necessity to identify how separately the managerial knowledge improves the resources capability. That is, knowledge creates the most strategically significant resources (Morgan, *et al.*, 2003) (Costa *et al.*, 2019). There are also researchers that argue management team may satisfy the conditions for achieving competitive advantage' (Carmeli and Tishler, 2004). However, before going further relationship with competitive advantage, we found the necessity to test the role of managerial knowledge and entrepreneurial skills on building and/or improving firms capability.

## Implications for practitioners

Small scale enterprises sector has been recognized as an integral component of economic development and a crucial element in the effort to lift countries out of poverty. More importantly, our country is developing industrial parks on selected economic corridors. Letting small business to operate their business in the industrial parks could generate positive if it implemented properly. Thus, outcome of this study will serve as an input for policymakers, enable small firm owners to make a right decision on their investment, and forward suggestion on integration between small scale firms and industrial parks. It's found that the influence of entrepreneurial ecosystem on the firm's capability improvement is better when firms made a linkage with academic institutions. Therefore, this paper clearly shows the importance of the integration to the government body, who might use the study as a stepping stone to improve the integration between higher educations and small firms. This may also be accomplished through incorporating small enterprises to industrial parks and improving the entrepreneurial ecosystem that contributes for the success of small enterprises. Moreover, it provides a clue for managers of small firms in improving their firms technological and resource capabilities through building managerial knowledge and entrepreneurial skills.

## Declarations

We, **Tesfaye Hailu** and **Abdella Kosa**, hereby declared that we have carried out a research entitled "**The Role of Industrial Parks Entrepreneurial Ecosystem in Strengthening Ventures' Capability: Evidence from Ethiopian Small Manufacturing enterprises**". Thus this is our bonafide work and that all sources of materials used for this research have been duly acknowledged. We are submitting the manuscript of this study to the reputable journal – **Journal of Innovation and Entrepreneurship** for publication.

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## Availability of data and materials

This manuscript was designed from a research which was conducted by Tesfaye Hailu and Abdella kosa. Data were collected from small manufacturing owner in Addis Ababa, Ethiopia and their responses were

kept confidential and were used for this study only. But the raw data are still in our data repository.

Therefore;

The datasets generated and/or analysed during the current study are not publicly available due to our university's ethical procedures, but are available from the corresponding author on reasonable request.

### **Competing interests**

This section describes whether there is conflict of interest (financial or non-financial) on the manuscript. Hence, since it was carried out as staff research at Kotebe Metropolitan University, the authors would like to assure the publisher there would not be competing interests, if any the risk would be on us.

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### **Authors' contribution**

Both authors contributed to the study conception and design, analysis and discussion. Material preparation, data collection and analysis were performed by Tesfaye Hailu, and Abdella Kosa. The first draft of the manuscript was written by Tesfaye Hailu and Abdella Kosa and both authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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