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Description	一般講演要旨

The Effect of Industrial Clusters and Startup Agglomerations in the same Sector on Entrepreneurial Ecosystem: The Case of African Countries

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1. Introduction

Creating entrepreneurial ecosystems is collecting attentions of policy makers to create employment, promote economic growth and spur social innovation (Brown et al., 2014; Morihata et al., 2023; Mason & Brown, 2014; Spigel et al., 2020; The World Economic Forum, 2013), however, there are many things about policies to promote entrepreneurship which has been unrevealed by research. One of the unanswered questions is that “is it better to focus on one or some sector(s) to support entrepreneurial ecosystems?”. This research aims to identify the important conditions for entrepreneurial ecosystems in African countries, and how these conditions are beneficial for startups in Africa.

2. Literature Review

Entrepreneurial Ecosystem: One of the definitions which is recently and widely accepted (Harris & Menzel, 2023) is “a set of interdependent factors and actors that are governed in such a way that they enable productive entrepreneurship in a particular territory” (Leendertse et al., 2022, p.1; Schrijvers et al., 2023, p.1; Stam & Ven, 2021, p.809; Wurth et al., 2023, p.227).

Among some models developed through quantitative research, I followed the model by the serial works from Stam and Ven (2021), since it can be replicated easier by practitioners, as JICA has already adopted in its strategy paper (Morihata et al., 2023), because the indicators can be obtained from the public data and have no need to conduct questionnaires like Acs et al. (2014) did.

Industrial Cluster: The most cited definition of the cluster is that it “is a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities” (Porter, 1998, p.199). The companies in the same or

related industries which are horizontally or vertically connected, get benefits from sharing infrastructure, lowering transportation costs, being easily found by business partners, collaborating with other firms in the cluster, and using knowledge spilled over (Malmberg & Maskell, 2002).

In the studies by the cluster approach, it is confirmed that clusters have benefits for startups. Clusters can lower the barrier for entry (and exit) and serve as a kind of incubation by realizing sector-specific knowledge spillover, attracting skilled workers, obtaining specialized inputs easily, lowering uncertainty by subcontracting and creating demand (Arif & Sonobe, 2012; Porter, 1998; Rocha & Sternberg, 2005; Spigel & Harisson, 2017). Collaboration and shared knowledge generated in clusters are advantageous for entrepreneurs since startups have not yet even noticed what they need but still can access the tailored environments (Maskell, 2001). Also, higher competitions and technological knowledge spillovers in the cluster will stimulate product innovations among startups (Gilbert et al., 2008).

Research Gap of Entrepreneurial Ecosystem Approach: The main research gaps of the Entrepreneurial Ecosystem approach can be classified into the following three. First of all, there is no commonly shared model and indicators for each element, and also few things have been revealed so far, for instance, which components are more important than the others, what kind of configuration can be applicable in which countries or cities, and so forth (Kanama, 2022). Secondly, it is difficult to conduct comparative studies at regional level across the countries and the efforts tend to end with national level studies (e.g., Acs et al., 2014). Lastly, while the Entrepreneurial Ecosystem approach came into being from the approaches including the cluster approach, it usually considers startups and their related actors in

general, thus pays less attention to the “industry” or “sector” (Acs et al., 2014; Kanama, 2022; Wurth et al., 2023). Also, unlike “collaboration” or “networking” inside ecosystems which are often featured, the aspect of “competition” which cluster approach emphasizes has not been mentioned so much. Moreover, the approach was grown in European contexts and in developed countries, so it has not yet been contextualized in developing countries including Africa (Kansheba, 2020).

Yet, there can be found a small number of studies which seem to suggest some effects which clusters have on ecosystems. For example, Mason and Brown (2014) suggested that ecosystems emerge from fertile soil where there are pre-existing assets which can be regarded as “clusters”.

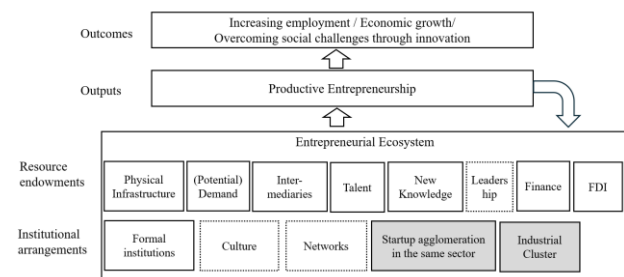
When it comes to the relationship between ecosystem and startup agglomerations in the same sector, again there is only a little research. One argument is which type of the ecosystems is better; “industry specific ecosystems” or “diverse industry ecosystems” (Mason & Brown, 2014). Even when there are several startup agglomerations of different industries in one ecosystem, there should be “nested” and “cohesive” ecosystems. Spigel (2022) found that, startup agglomeration of Fintech or financial industry is nested, however, his study used data of human resource flow only in Fintech of the U.K.

3. Research Question

The current study seeks to examine, first of all, are startup agglomerations, that is, numbers of startups in the same sector, and industrial clusters, the pre-existing industry, important for creating an effective entrepreneurial ecosystem in African countries? There are three possible models of the causal relationship: i) the biggest sector which has substantial number of startups in the ecosystem (startup agglomeration) is beneficial to generate more startups, ii) industrial cluster(s) in the ecosystem is beneficial to generate more startups, iii) the co-existence of startup agglomeration and industrial cluster(s) is beneficial to generate more startups. In other words, this research examined if startup agglomerations and industrial clusters are sufficient conditions (and also necessary conditions) for startup generations in some African contexts where some different configurations of conditions may exist. The

second question is, how do startups benefit from startup agglomerations and industrial clusters in African countries? This study is based on the model of entrepreneurial ecosystem as illustrated in Figure 1.

Figure 1
Entrepreneurial Ecosystem Model in This Study



Note. i) Elaborated based on the previous studies (Leendertse et al., 2022; Schrijvers et al., 2023; Stam & Ven, 2021) ii) Dotted square; excluded from fsQCA study, Gray square; main conditions to be examined in this study.

4. Methodology

In the quantitative analysis part of this study, fsQCA (fuzzy-set Qualitative Comparative Analysis) is used to figure out if “Startup agglomerations” and “Industrial clusters” are sufficient conditions of entrepreneurial ecosystem and with which kinds of other conditions to generate startups. Among some ways of calibration, “continuous fuzzy set” is adopted. Regarding necessary conditions, I set the consistency threshold as 0.9 and coverage threshold as 0.5 as recommended, and for sufficient conditions, I set the consistency threshold as 0.8, while above 0.75 is advised (Schneider & Wagemann, 2012). I tested three different models of conditions. For model i, I set the ninth condition as “the number of startups in the sector of which the most startups belong to in the ecosystem” which represents “startup agglomeration”. For model ii, I set the ninth conditions as “state of cluster development” which represents “industrial cluster”. For model iii, I set both two conditions above as ninth and tenth conditions.

In addition to the desktop research, I conducted online interviews from May 21, until June 14, 2024. The interviews had the complementary role to explain the results obtained by fsQCA more in detail, and how startup agglomerations and industrial clusters are beneficial to startup generation in African cities. The interviewees are startup founders and employees, venture capitalists, government officials. Four persons were in Nairobi, Kenya,

and three persons were in Accra, Ghana. Each interview was semi-structured. The sector in which the greatest number of startups are agglomerated in Nairobi is “financial services” (74 startups), and those in Accra are “E-commerce” and “financial services” by the tie vote (22 startups). Therefore, the interviewees were related to those sectors

5. Data

In this study, 30 cities in 18 countries are examined. All the elements and output can be measured by indicators based on the previous literature, but the indicators were modified to use available data and to capture the characteristics in African countries. For some elements, two or more indicators are combined by taking the average, however, for “(Potential) Demand”, the indicators “GDP in millions of USD at current prices per capita” and “Population” are combined by the ratio 20:80, to emphasis the potential expansion of demand in the near future.

6. Results

FsQCA: When comparing the most parsimonious solutions of sufficient conditions of the three models, “Intermediary” appeared in all the models with the raw coverage 0.639. But in model i and iii, “agglomeration” also appeared with “~Formal”, “~Physical”, “~Knowledge” or “~Fdi”.

When comparing the intermediate solutions of sufficient conditions of the three models, the coverage of model iii is slightly the highest (0.804) than the other two models, thus explaining the ecosystem better. “Agglomeration” appears in three configurations out of four in model i and iii, and “Cluster” appears in all configurations in model ii and iii. Therefore, these conditions can be explained as important. “Formal * Talent * Intermediary * Agglomeration and/or Cluster” appears in all of the three models with coverage over 0.5. “Formal * Physical * Talent * Intermediary in model i and plus “Cluster” in model iii appear with coverage almost 0.5. The two solutions can be assumed as important explaining more cases than other solutions. The difference between the above two solution terms is that “Physical” in the former is replaced by “Agglomeration”.

Interview (Nairobi): All the four interviewees mentioned “M-PESA”, which is a widely used mobile payment service using SMS.

According to D in Kenya National Innovation Agency, there are about 60,000 APIs using M-PESA, which enable various Internet services by startups. The startup AA chose to locate in Nairobi because it is “home of M-Pesa” and the merchants have already had “till numbers” (for using M-PESA account for business transactions), so it is easier to have the merchants on their platform. A and C mentioned that there are many “partnership agreements” among Fintechs in Nairobi. Also, all the four interviewees mentioned that “human capitals are floating” (B) among Fintechs in Nairobi. For example, about 60% of employees in Startup AA came from other Fintech startups in Nairobi and the interviewee A herself was also recruited from the other Fintech. There is also a competition among them. D observes that Fintech companies “poach” workers to beat their competitors.

When it comes to interactions between Fintech startups and clusters, there were some relations and benefits. A said that one Fintech has many agents in Gikomba market so that the shop owners can easily pay the rent to the government. Also, B knew one startup which had sold a bunch of secondhand clothes to shops in Gikomba. It can be said at least Gikomba, the collection of informal sectors, functions as a market for startups. C mentioned about “Saccos” (Savings and Credit Cooperative Societies). His Venture Capital and the customer startups often visit Saccos in rural areas or in slums for transactions and the like.

What is more, A stated that the Fintech AA, which at first operated a currency swap business in Lagos, proceeded to Nairobi (and Accra) because there are trades between Nigeria and Kenya; it can probably be specified as sisal (Ministry of Foreign Affairs of Japan, 2024) which may be a cluster or at least a pre-existing industry in Nairobi or Kenya.

Interview (Accra): With regard to the advantages by startup agglomeration, the flow of human capitals was again mentioned by all of the three interviewees. In addition, there are not only the partnerships of recruitment but also those for payment process or offering service options to customers. According to G, Fintechs need to have a partnership with licensed Fintechs to process payments. Another example is a sales marketing partnership to Europe between Startup FF and the other IT startup. What is different with Nairobi is that the main players in the industry are always

willing to pass on their knowledge or advice to other founders" (G) in terms of fundraising and the regulatory hurdles.

With regard to cluster, interviewee F explained that there are a large number of shipping companies in Accra, and she met the related persons at the gatherings of Ghana Chamber of Commerce and Industry. Because her startup FF delivers its services to European countries and the U.S., and has an intention to expand its business to other African countries, she receives information regarding trade and tax. In return, her company offers how to digitize the manual operations.

Another notable feature of the interview answers is that two of the interviewees remarked about "SUSU" which is a community-based group of saving and lending in Ghana. Fintech which F formerly engaged, provided services to SUSUs for digitizing their operations. Similarly, the target of Fintech GG was informal sectors, especially SUSUs to help them digitize their operations. SUSU basically consists of the members who have the same job, e.g., bus driver, shop owner, gig worker, and so on. The company GG has done marketing in some markets including Kantamanto, which is the biggest secondhand clothes market in Ghana (Benjamin, 2022; Green Views, 2024).

7. Discussion

By the results of fsQCA, it was proved that when including both "Startup agglomeration" and "Industrial cluster" as conditions, the entrepreneurial ecosystem to generate startups can be explained the best. It also means that these two conditions are important. Also, it was proved that while "Intermediaries (incubators and accelerators per capita)" is the most important single condition, "Startup agglomeration" can become a replacement on some occasions with other conditions. It can be assumed that those two conditions have some similar functions, such as to give general and technical advice to entrepreneurs, gathering stakeholders and giving opportunities for funds and so on.

The two solution formulas; "Formal institutions * Talent * Intermediaries * Startup agglomeration and/or Industrial cluster" drawn from the case of Nairobi appeared in all the three models, and "Formal institutions * Physical infrastructure * Talent * Intermediaries * Industrial cluster" drawn from Accra and Kigali are proved to explain more

cases. Comparing the two important solution formulas, "Physical infrastructure" was replaced by "Startup agglomeration" in the formula of Nairobi. It can be assumed that "Startup agglomeration" can cover the low Internet connection. Presumably, the physical proximity with other startups and the related actors covers the disadvantages by low Internet infrastructure. Furthermore, "Formal institutions" and "Intermediaries" are in all of the four configurations, meaning indispensable for all of the ecosystems.

Those results are different from the research in Europe (Schrijvers et al., 2023), where "Talent" or "Knowledge" were important. Compared to Europe, the African startups are biased toward Fintech. It can be assumed that the "Knowledge", which is the R&D investment has not matured in African countries except for South Africa and Egypt, and the created knowledge may not be well connected to startup activities. Instead, digital technologies and skills are applied broadly by market demands and local social needs or severe challenges such as non-prevalence of local banking services.

By looking deeper at the cases, not only Nairobi but also Accra without startup agglomeration in the same sector clearly receive benefits from them. Firstly, human resources are floating among Fintechs, and also from banking sector and IT startups sometimes by partnerships for recruitment. This kind of human capital flow is a typical effect of industrial clusters (Marshall, 1920/2013) and it is thought to be inherited to startup agglomeration. Secondly, many Fintechs and IT startups have partnerships with the previously succeeded companies. Also, they have partnerships with other Fintechs. This enables the startups to quickly provide a variety of services which might be impossible to provide by themselves alone. Due to this, they can cut time and costs, and increase value-added.

There are some notable points. One thing is that not only they cooperate but also compete, which makes the ecosystem more vibrant, which is often less mentioned in entrepreneurial ecosystem studies. Another point is that the rich agglomeration of Fintechs is utilized as the tools for innovation by startups in broader sectors, in other words, downward causation from Startup agglomeration of Fintech to different sectors started in Nairobi which may lead to radical product innovations.

When it comes to the relationship

between startup agglomeration and clusters, there are limited but definitely some relations, and clusters benefit startups. These relationships do not necessarily accrue from those in similar sectors. Another thing is that “Saccos” and “SUSUs” play prominent roles among Fintechs by making their “demand” collective and visible and enable easier access and operation. They may be regarded as small clusters serving the ecosystem instead of clusters to some extent.

At least in terms of human resources who have sectoral knowledge, the startup agglomeration of Fintech in Nairobi and startups of IT or Fintech in Accra seem “nested” which may stimulate incremental innovation as Spigel (2022) illustrated. However, the ecosystem also has “cohesive” aspects which may lead to radical (product) innovation, from the fact such as general managerial information spillover from shipping industry and obtaining markets from clusters. Together with the downward causation from Fintech to broader sectors, the ecosystems cannot be classified clearly as either nested or cohesive, but they do have both aspects.

8. Conclusion and Policy Implications

It became clear that the recommended configuration is either of the followings: one is “Formal institutions”, “Talent”, “Intermediaries”, “Startup agglomeration” and “Industrial cluster” which was derived by Accra and Kigali. Another is “Formal institutions”, “Talent”, “Intermediaries”, “Physical infrastructure” and “Industrial cluster” which was derived by Nairobi. Especially, when “physical infrastructure” namely Internet connection and transportation infrastructure is weak, startup agglomeration will help the ecosystem to function better, hence the second configuration derived by Nairobi will fit better.

In addition, the startups received various benefits from startup agglomerations in the same sector such as human resource flow, quick implementation of services, effort to enhance competitiveness by competition, group dynamics for regulation change, opportunities to meet stakeholders and so on. Fintechs in Kenya receive benefits from the previous successful startup by downward causation, but at the same time started to benefit startups in different sectors by further downward causation. Moreover, the interviews also revealed the various relationships between startups and

companies and informal sectors in industrial clusters. These relationships do not occur necessarily in the close sectors.

“Startup agglomeration” and “Industrial cluster” are revealed to be important for ecosystems. Supporting to gather and network of startup in the same sector until the number will reach at least over 25, ideally 50 or more, supporting ecosystem where there is one or more industrial cluster(s), can be effective for the development of entrepreneurial ecosystem in African cities. It should be noted that “Formal institutions” and “Intermediaries” should always exist. In order to make favorable radical innovation, improving capacities of the users (companies in the industrial clusters and informal sectors) is needed, for example, by stimulating human capital flow between startup agglomerations and industrial clusters.

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