

The Geography of University Startups:  
A comparative Analysis of Athens and Berlin

Anastasia Patsouri, Technical University of Berlin  
Leonidas Doukissas, Panteion University of Social and Political Sciences Athens  
Yannis Psycharis, Panteion University of Social and Political Sciences Athens

ERSA Congress 2023

## Contents

Abstract

1. Introduction
2. Theoretical Background & Research Question
3. Methodology and Data
4. Presentation of Findings
  - 4.1. The case of Berlin, Germany
  - 4.2. The case of Athens, Greece
5. Discussion & Conclusions  
Acknowledgements
6. Bibliography

## Abstract

This paper aims to examine the geography of start-ups in Athens and Berlin. Start-ups are considered as a policy tool that could be used for the enhancement of job opportunities and career trajectories, promotion of entrepreneurial activity, and stimulating the economic activity after a recession. The paper is twofold: first to focus on the connections between Universities and entrepreneurial activity of the graduates and second to examine the location of start-ups along with other attributes of the start-ups such as the sector and volume of economic activity, niche market orientation, level of digitalization and technological thickness among others. The study is built on statistical data that are collected from the respective authorities of selected Universities in Athens and Berlin. Results show that there are quite a lot of differences between the two cases. The promotion of entrepreneurial activity of graduates has a longer tradition in Berlin than in Athens. As regards the location choices and geographical clustering of enterprises, point-pattern analysis shows that start-ups in Athens are more clustered at the city center of the metropolitan area, while location choices are more dispersed in Berlin. These findings call for more in-depth research with broadening the sample, complementing the analysis with qualitative research and make the findings meaningful and robust.

## 1. Introduction

Entrepreneurship constitutes a longstanding element in urban and regional economic development. The benefits of entrepreneurial activity to the renewal of the production environment and the creation of job opportunities have been highlighted by the relevant literature. Given its prominent role in job creation, enhancement of economic activity and increase in income, entrepreneurship is regarded as a policy tool for urban and regional development.

Recent years, there has been an enrichment of entrepreneurial activity in the form of start-up enterprises. This trend came primarily as a consequence of recent technological advances. Economic crisis acted as a catalyst giving even more impetus in this trend.

One of the stakeholders that were involved in start-ups and entrepreneurial activity are Universities for both reasons. First, in order to bridge studies and academic research with the labor market and second to increase the retention rate of graduates in the location of the

University. The latter had been even more important for small universities outside the large urban centers.

The study of entrepreneurial activity that has been initiated by university programs constitutes a very interesting research area. To reignite economic activity after a recession, the entrepreneurial activity of graduates concentrates the attention of the scholarly research and the policy makers.

Urbanization is another factor that is related to start-ups. Given the fact that agglomeration in cities is in full swing and the migration of high skilled workers and young scientists in metropolitan areas and large cities it would be interesting to study the geography of start-ups across space and within urban agglomerations.

Today more than half of the global population resides in urban areas and by 2050 two thirds of the world population is expected to live in urban areas (UN 2018). O'Sullivan (1981) argues that the concentration of opportunities attracts entrepreneurial skills in large cities. As a result the urban – rural divide could be characterized as an inequality in opportunities between urban and non-urban areas.

Cities are conducive to the development of entrepreneurship (Jonek-Kowalska and Wolniak 2021).

Defining an urban city as ‘‘that concentration of people located close together for residential and productive purposes’’ (Davis, 1973), this study wants to explore the topography and geography of startups in the urban areas of Berlin, Germany and Athens, Greece. For that reason, this study selects and focuses on the startup firms that stem from University and Research Institution infrastructures such as university incubators or spin-offs, in Athens and Berlin.

Startups are defined as those businesses run in their initial phase with the implementation of innovations and can be seen as the manifestation of innovative entrepreneurship in the era of digital revolution (Skala, 2019). Startups are thus a key part of modern entrepreneurship and innovation (Colombo and Piva, 2008; Davila et al., 2003; Mustar et al., 2008).

New startup firms are artifacts for transforming entrepreneurial judgment into profit, they are therefore a driving force of the urban economy (Spender, 2014). At the same time, as

entrepreneurship has the potential of enhancing sustainability and startups are an integral part of entrepreneurship, startups can foster sustainable development and therefore their study is important for sustainable urban development (Rashid, 2019).

Startup activity influences the geography of cities with the creation of spatial entrepreneurial clusters and ecosystems in spatial scales of micro and macro geographic levels (Adler et al. 2019). It is interesting therefore, to explore the geographic dimension of startup entrepreneurship and how startup settlement changes entire districts of cities. To do so, the disciplines of urban economics and economic geography are taken into consideration to investigate the topography of the university startups.

## 2. Theoretical Background and Research Question

Krugman (1991) defines economic geography as “the location of production in space” that examines “the fascinating issues that arise when firms must make interdependent spatial decisions”. The new economic geography explains formations of diverse economic agglomerations in space (Fujita and Krugman, 2004). Based on the observation of the spatial economy, the current study wants to explore the geography of University startups in Athens, Greece and Berlin, Germany. Where do University startups locate their headquarter operations in those two urban areas and how are they then distributed across the urban space? The topography and location settlement of University startups is studied with the scope of researching patterns of agglomeration, concentration or desperation.

What is the spatial and geographical impact that startups have in Athens and Berlin? Florida (2014) mentions that high-tech start-up businesses are spatially concentrated within inner-city districts. At the same time “startups are a big part of a new movement back to the city. Young people increasingly turn away from suburbia and move to hip urban districts, which become breeding grounds for new firms.” (The Economist, 2014).

Sunley (2000) mentions that urbanization economies exist when diverse industries locate in an urban area and benefit from general infrastructural advantages and common externalities. “Packing” thus diverse industries together in close quarters can also stimulate innovation with

the diversity of industries increasing growth (Jacobs, 1970). In those lines, the current paper explores the Athenian and Berlin innovation stemming from University startups.

Classical writers in location theory have analyzed the basic concepts and determinants for the location of economic activity of enterprises. Weber (1909) explains in his spatial triangle, that firms choose locations in which the total cost per unit distance and weight of material transport becomes the minimum. Hotelling (1929), Polander (1935), Lösch (1954) and Christaller (19??) provide a fertile ground for the investigation of locations choices of enterprises.

These classical works constitute the standard reference for the location theory. However, these studies had been deployed in an historical era very different from today. During the classical age of location theory economic activity was primarily dominated by agriculture and on a later stage by industrial activity. Today, the service sector is the dominant sector of the production activity. In addition, technological advances and digitalization shape a completely different environment within which enterprises take decisions regarding the choice of the location.

Agglomeration theory is also taken into consideration, studying the clustering of firms, in our case University startups, together in a particular geographic space, explaining the phenomena of co-location of firms. Doukissas et al. (2020) additionally affirm that local demand and good transportation have also significant positive effects on the location choice and clustering of firms.

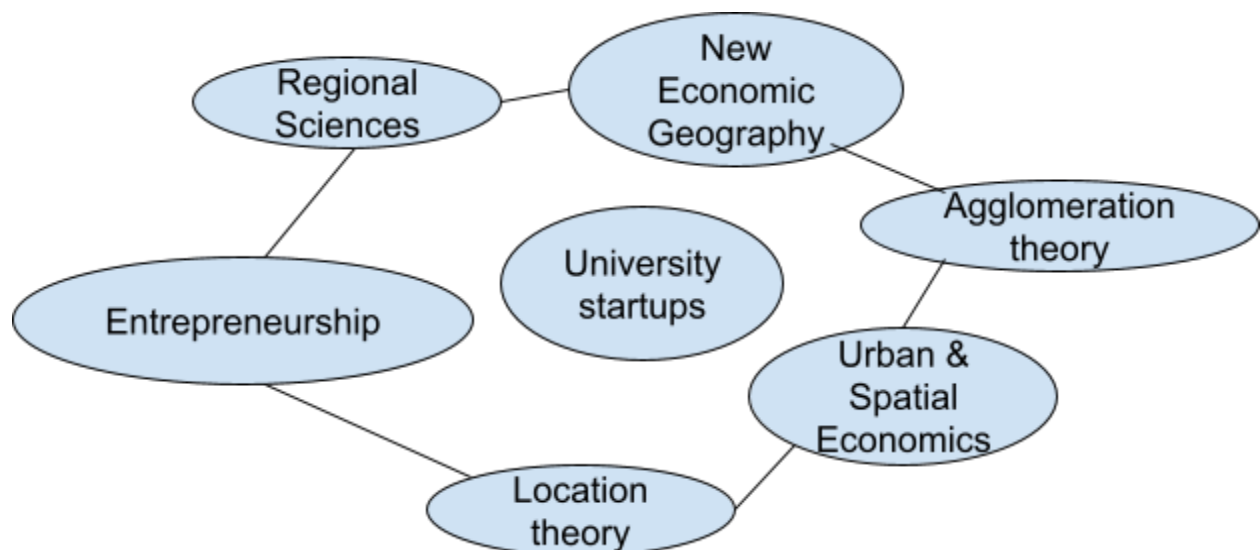


Figure 1: Theoretical background, own source.

It is important to understand how university startups are distributed in space to understand better the positive and negative effects of their distribution. Such spatial distribution effects can be connected to: a) the potential economic disparity on the basis of agglomeration effects (Martin 2011), b) the minimisation of external transaction costs due to spatial agglomerations, c) the increasing returns to industrial localisation, meaning any increase in inputs that generates a disproportionately larger increase in quantities of outputs and d) how agglomeration raises the rate of growth, due to again increasing returns of the concentrations of industries in particular localities (Krugman 1991).

So do University startups agglomerate or not in Athens and Berlin? Amin (2000) explains how small firms benefit from agglomeration in terms of cost savings and economic opportunities normally denied to the usually isolated small firm.

As Porter mentions (1990), "Competitive industries are not scattered helter-skelter throughout the economy but are usually linked together through vertical (buyer-seller) or horizontal (common customers, technology, channels) relationships. Nor are clusters usually scattered physically; they tend to be concentrated geographically." This concentration creates the so-called "shared technological capital". Researchers admit the existence of the "shared technological capital" created by the industrial districts and their agglomeration, as part of the regional and national innovation (DeBresson and Amesse, 1991; Freeman, 1991, 1995; Lundvall, 1992; Nelson, 1993). Additionally, Krugman (1991) explains that due to local flow of information, industrial centers generate technological spillovers. Such "technological spillovers play an important role in the localization of some industries". Along the above lines, we can also examine the existence of a common "technological capital" for the case of University startups in Athens and Berlin and study what influence "technological spillovers" have on the localisation of the University startups in Athens and Berlin.

### 3. Methodology and Data

The paper follows a deductive approach, where location theory and agglomeration theory are taken into consideration on the geography of startups coming from Universities and Research Institutions in Berlin, Germany and Athens, Greece.

The authors took a quantitative methodological approach. Using point pattern analysis to explore the patterns of University startups in Berlin and Athens, geographical data were analyzed using ‘R’, the programming language for statistical computing and graphics (Kopczewska et. al, 2017).

Data were gathered and two datasets were created, one for Athens one for Berlin. Each dataset included the names of the startups, the number of employees, the sector they belong to, the year of foundation, the University they belong to, their website and their full addresses.

The collection of data followed two different processes for the two cities.

Firstly, for the case of the Athenian University startups, data were collected through desk research, website observations and direct telephone calls with the Universities, the Research Institutions and the startups themselves in Athens. The size of the sample for 2022 is 49 (n=49), including startups that have been ‘‘born’’ in the last decade. Overall, data were collected from five Universities and Research Institutions:

- a) the Archimedes Center, the Center for Innovation and Entrepreneurship of the National and Kapodistrian University of Athens
- b) the Athens Center for Entrepreneurship and Innovation (ACEIN), the incubation & acceleration center of the Athens University of Economics and Business
- c) the InnovinAgri Office, the Innovation, Entrepreneurship and Technology Transfer Office of the Agriculture University of Athens
- d) the Technology Transfer Office of the National Technical University of Athens
- e) the Lefkippos Attica Technology Park of the Demokritos Research Institute



Secondly, for the case of Berlin, the dataset was ready and was provided by the Center of Entrepreneurship of the Technical University of Berlin. To compile the sample, the following ten biggest Universities and Research Institutions were taken into consideration:

Technische Universität Berlin

University of Applied Sciences Potsdam

Hochschule für Technik und Wirtschaft Berlin

Berlin School of Economics and Law

Humboldt-Universität zu Berlin

University of the Arts Berlin

Freie Universität Berlin

University of Potsdam

Hochschule für Schauspielkunst Ernst Busch

Beuth University of Applied Sciences Berlin

Overall, the Berlin dataset of University startups included 1642 startups. The data was cleaned and startups with no headquarters in Berlin were manually removed. Therefore, the final dataset includes 946 startups ( $n=946$ ) for the year of 2022.

The number of employees is also included in the datasets. For the case of Athens the number of employees was collected manually, asking directly the startups. For the case of Berlin the number of employees was included directly in the dataset for 840 startups. For the rest 106 the average number of 9 employees in Berlin for 2022 was included, based on official data of the Berlin Senate of Economics, Energy and Public Enterprises (Dealroom.co, 2023).

Working further on the datasets, the longitude (x) and latitude (y) had to be extracted for all University startups in Athens and Berlin, to define the exact location of the startups.

For the Athenian dataset, the coordinates were extracted manually through google maps. Each time the full address, namely street, house number and postal code, of the startup was given in order to extract the geo-coordinates. This process was repeated 49 times, for all 49 startups.

For the Berlin dataset, a different strategy had to be implemented to avoid manual work, as the sample was almost 20 times bigger than the Athenian one. The physical addresses – namely street, house number and postal code – were converted to numerical geo-coordinates by means of an automation, programmed in Python. The automation employed the Python libraries Geopy and Geopandas, and consulted the Nominatim Geocoding service that is built on top of OpenStreetMap data (to be found here: <https://nominatim.org>). Based on a small random sample as well as plotting the total results on a map, the plausibility and accuracy of the conversion results was verified.

As a next step in our quantitative process, point pattern analysis was applied on the two datasets. As Marcon et al. (2010) mention, point pattern analysis attempts to estimate the pattern or distribution of a set of points on a study area. To do so, a two dimensional area of the respected point pattern is defined as a vector  $x$  with coordinates  $x_i = (x_i, y_i)$ . Random point process theory is used in order to investigate the empirical spatial distribution. Møller et.al (2004) theoretically proved the point process theory. In detail, if we examine a random set of events at a distance  $r$ , then the expected number of events will be equal to the frequency multiplied by the distance  $r$ . Usually referenced in the bibliography as Poisson Process or Complete Spatial randomness (CSR) (Diggle, 1983) (Doukissas et al, 2020). Setting our null hypothesis,  $H_0$  equals a completely random distribution of points (independent distribution of points).

$$K_{CSR} ( d ) = \pi r^2$$

Whether there is clustering or not, can be acquired by the above equation. If  $K_d ( r ) > K_{csr} ( r )$  then clustering occurs at a distance  $r$ . On the contrary, if  $K_d ( r ) < K_{csr} ( r )$  then spatial dispersion exists. The  $K_d$  function is regarded as favorable to economic geography (Marcon et al 2010). What is more, Duranton et al (2005) suggested an indicator that estimates the probability of finding a neighbor at distance  $r$  from each point.

$$K_d(r) = \frac{1}{n(n-1)} \sum_i \sum_{j \neq i} k(\|x_i - x_j\|, r),$$

where  $k(\|x_i - x_j\|, r) = \frac{1}{h\sqrt{2\pi}} \exp \exp \left( - \frac{(\|x_i - x_j\| - r)^2}{2h^2} \right)$  is the Gaussian kernel.

Measuring neighbors at a distance  $r$  needs the use of a function, therefore the use of a Gaussian kernel in the type of a function is chosen. To evaluate the importance of the acquired results, a confidence interval for the null hypothesis can be built. The marks, or weights, that indicate the employees are distributed again across all areas of concentration and the overall geographical trends of all types of points. The null hypothesis of the random position of the S-type points is rejected if the function  $K_d$  is above or below the confidence threshold. The  $K_d$  function can incorporate point weighting (Duranton et al., 2005).

#### 4. Presentation of Findings

##### 4.1 The case of Berlin, Germany

Berlin is the capital of Germany, surrounded by its Metropolitan area of Berlin/Brandenburg. Berlin is the most populous city in Germany with 3.748.148 residents (Amt für Statistik Berlin-Brandenburg, 2019). The city spreads across 891 km<sup>2</sup>, in 12 boroughs, with a population density of 4.055 residents per km<sup>2</sup> (Amt für Statistik Berlin Brandenburg, 2018).

In the last 15 years, Berlin has established a strong startup scene. Berlin's startup ecosystem to some is even comparable to Silicon Valley, having the nickname of Silicon Allee, referring to the Torstrasse area of Mitte where a plethora of startups reside. In specific, Berlin is the third largest hotspot for startups in Europe after London and Paris (Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft, 2023a) and therefore it is picked in the current research as a representative case of a successful, established, central and important startup City. According to the 'EY Startup-Barometer Germany', Berlin startups attract by far the highest capital in 2022, totaling almost EUR 4.9 billion, surpassing all other cities in Germany and creating the Berlin startup hotspot (Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft, 2023b). Additionally, almost 40% of all financing rounds counted in Germany, happened in Berlin (390 financing rounds) (Ibid.).

Focusing on the University startups, Berlin counts more than 35 Universities, public and private (Hochschulen Berlin 2023) and a plethora of research institutions. Selecting the top 10 of the Universities and research institutions as explained previously, Berlin counts almost 1000 University startups in 2022 with headquarters in Berlin itself.

So proceeding in the analysis of the location of University startups in Berlin, our research gave the following results. As a first step a map was extracted illustrating the location of all University startups (Figure 2). A concentration in the districts of Mitte and Kreuzberg is visible. As a second step, point pattern analysis will follow. From what we speculate, point pattern analysis will indicate that the points are more dispersed in Berlin. However, we still have to prove it statistically through the analysis that will follow.

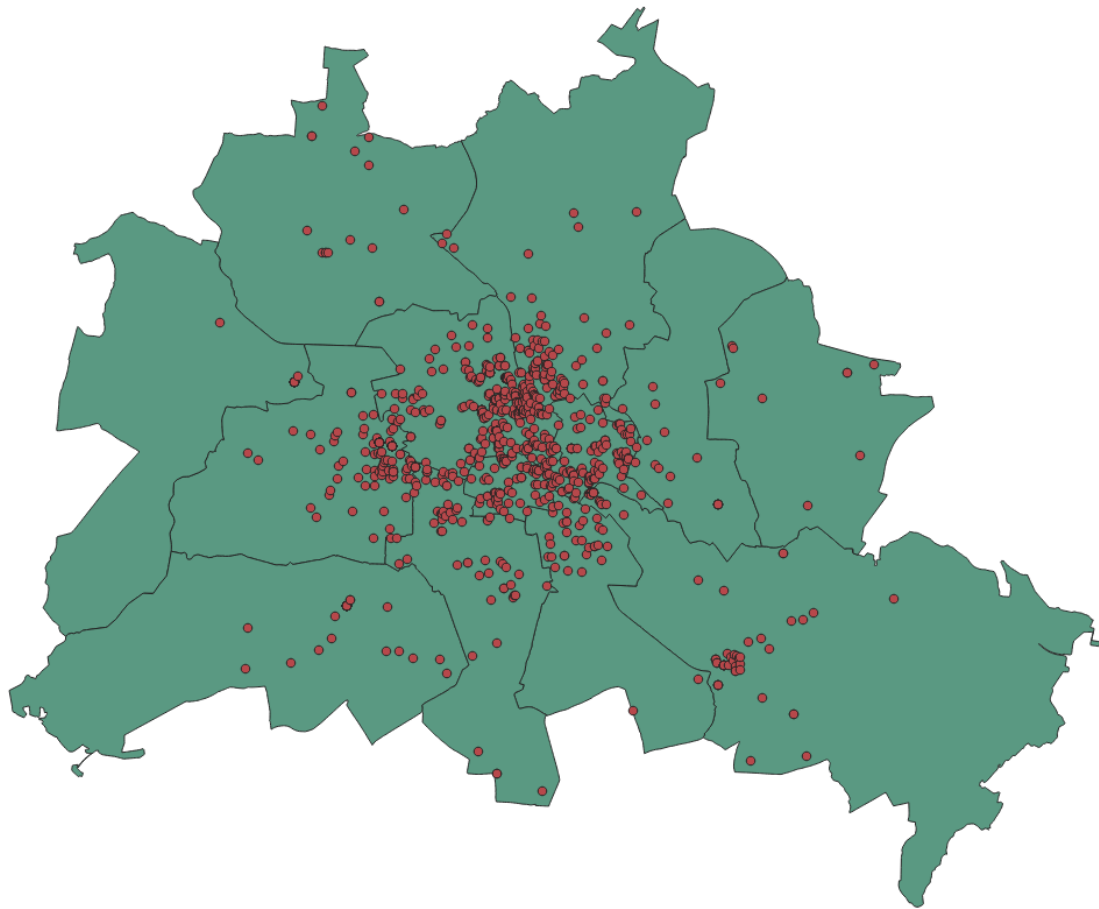


Figure 2: Berlin University Startups

## 4.2. The case of Athens, Greece

Continuing on our second case studied in this research on University startups, the city of Athens is chosen.

Athens is the biggest city and the capital of Greece, belonging in Attica; the surrounding metropolitan area of Athens. Geographically, Athens is located in the center of the Greek territory, when including the territorial waters as well. Athens has a dominant importance to the economic prosperity of Greece, with a significant amount of the national GDP concentrated in the metropolitan region of Athens. More specific, in 2010 the metropolitan area of Athens produced 48% of the total national GDP (ΠΕΠ Αττικής 2014-2020, 2019). Moreover, it has been calculated that if Athens was to be removed from Greece, the GDP per inhabitant would drop by 19.8% in 2015 (McCarthy, 2017).

Apart from the leading economic role Athens has for Greece, demographically the metropolitan area of Athens, gathers the one third of Greece's population, with 3.154.152 people residing in the broader area of Athens in 2019 (World Population Review, 2019). At the same time, Athens economic and demographic firsts, are accompanied with one of the highest densities in Europe. More specifically, in 2019 population density in Athens was on average 17.040 residents per km<sup>2</sup> (Ibid.), surpassing in some districts such as Kallithea and Nea Smyrni the suffocating number of 20.000 residents per km<sup>2</sup> (CIESIN, 2018). Compared to Berlin, the average population density of Athens is more than 4 times higher.

From an economic perspective, the urban area of Athens has suffered from economic degradation. Panori and Psycharis, explain that during the 2004-2015 period, economic and social conditions in the metropolitan area of Athens were worsened (Panori and Psycharis, 2018). More specific, in 2009, Greece was stuck with one of the most severe economic crisis that Europe has faced, becoming the target and the scapegoat of the global financial crisis of 2008. Greece shook the global news when in 2009 its existing "fiscal crisis turned rapidly into a sovereign debt crisis, which finally mutated into a full-blown recession" (Matsaganis, 2013). However, after the 10 years of recession, BCG (2018) marks 2018 as the beginning of the innovation and entrepreneurial rejuvenation through the support of the startup ecosystem. Investment opportunities and support systems such as the Equifund (combination of state and EU funding), create and further develop the newly born startup ecosystem in Greece. In specific, since 2020, there has been the Elevate Greece platform developed by the state that provides in-depth information on the Greek Startup Ecosystem.

Additionally, as the Deputy Minister of Development and Investments, Mr. Yiannis Tsakiris, highlighted in 2022: *“Greece managed to climb at the first position in the world in terms of improving the business environment since 2019, climbing a total of 16 places in the global ranking. At the same time, the OECD announced the data for the year 2021: in the index of foreign direct investments (FDI), Greece achieved an all-time record. During this year Greece attracted the most investments (over 6.3 billion euros) since the OECD started including Greece in the relative index. “* (Foundation 2022). That being said, Athens was chosen as a second case to examine the University startups, as compared to Berlin, the Athenian ecosystem is rather new, freshly established and in the periphery of Europe, but also in the cross-roads with the Middle East and Africa.

Focusing on the University and Research Institutions, Athens has around 20 universities and research institutions (public and private), out of which the top 5 are selected for this research as mentioned previously. In total almost 50 University startups are selected from 2022.

Following on the geography of those University startups, Figure 3 illustrates the points on the map of Attica, the metropolitan area of Athens. We observe a concentration in the city center. As a next step, point pattern analysis is implemented also in the case of Athens. Figure 4, Figure 5 and Figure 6 illustrate the results of our analysis. Figure 4 showcases the geography of University Startups in Attica, the metropolitan area of Athens, weighted by their employees. What we see is that the majority of startups employ up to 20 people. Figure 5 presents the geography of University Startups in Attica. Figure 6 presents the results of the Kd function. We can observe that  $Kd_{obs}(r) > Kd(r)$ , statistically significant clustering occurs at the distance of between  $r = 500$  meter and  $r = 4$ km. After the distance of  $r = 5$ km, spatial dispersion exists. Therefore, due to Kd function, agglomeration exists between 500 meters and 4km (Figure 6). Finally, we reject our null hypothesis  $H_0$  of random distribution of points, as we found agglomeration effects for the case of Athens.

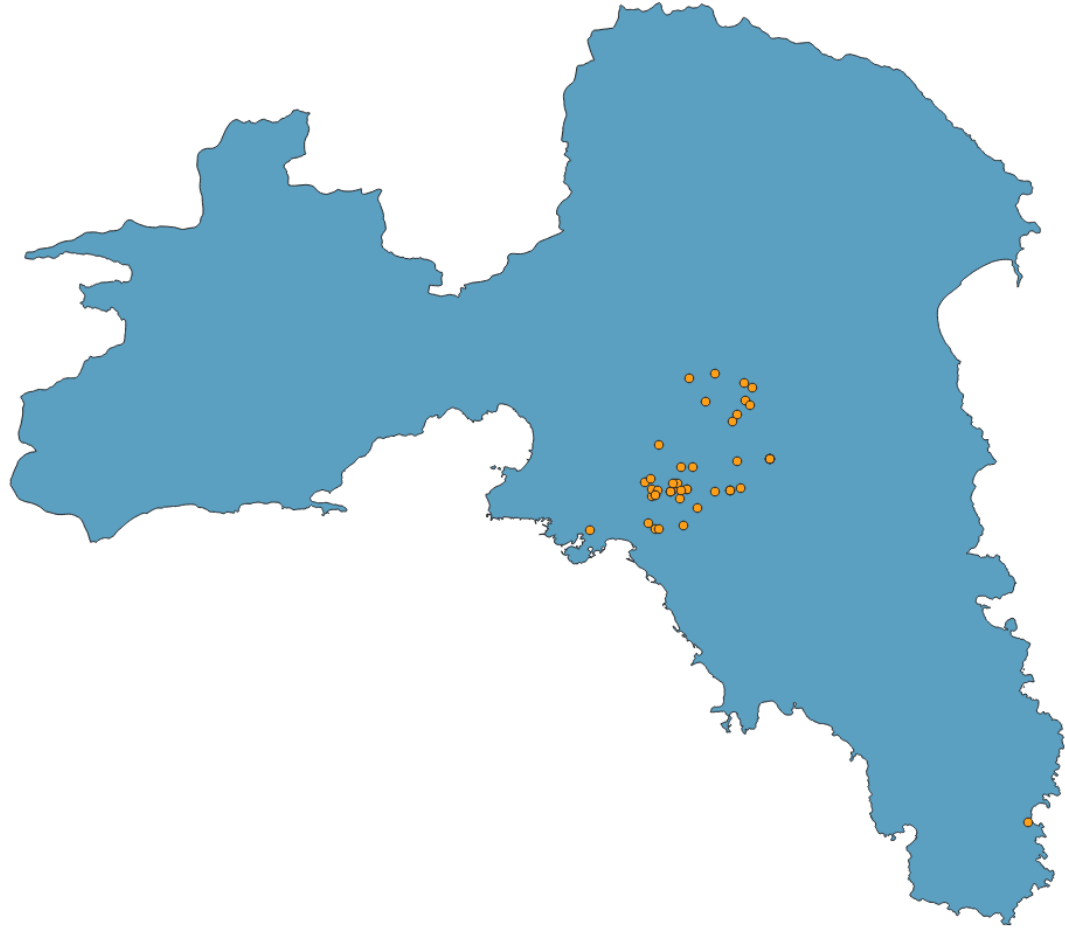


Figure 3: University Startups in Attica

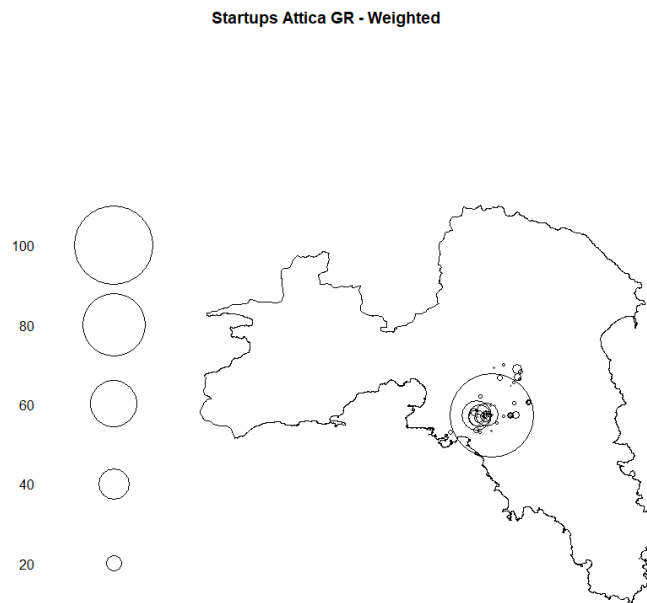


Figure 4: Startups Attica Greece, Weighted on employees

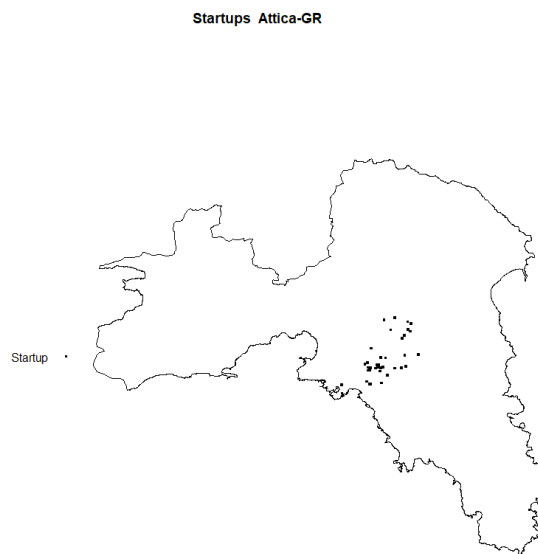


Figure 5: Startups Attica, Greece



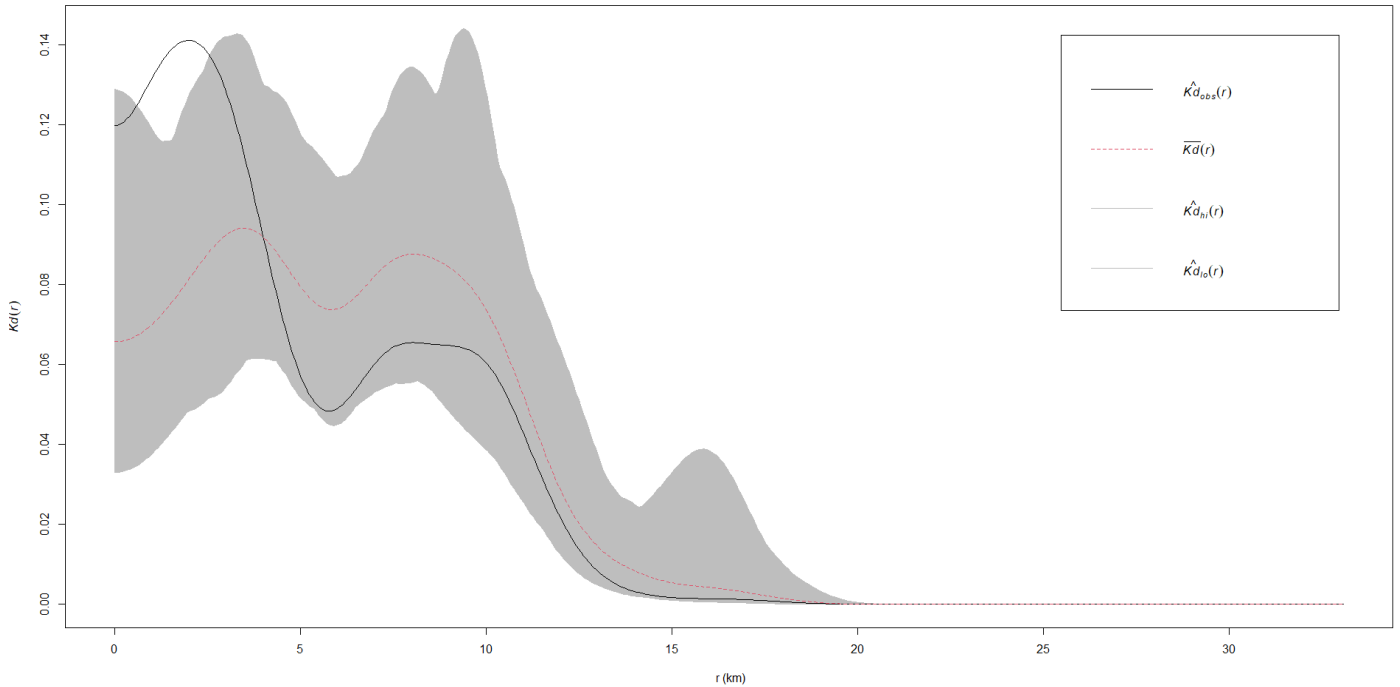


Figure 6: Results of Kd function

## 5. Discussion and Conclusions

The comparative analysis of university start-ups in Athens and Berlin, which is in the initial stage, has provided some preliminary findings.

First, Start-ups are located in the central areas in both Athens and Berlin.

Second, Athens does not have reached a critical mass of start-ups in order to provide robust results regarding location choices. The first impression is that these are located at the city center.

Third, location choices of Start-ups in Berlin are more dispersed. However, there are some clusters in high income areas.

This research is an attempt to analyze the university start-up and to examine location choices in a comparative perspective.

Future steps include the enhancement of the number of cases, will further analyze location choices and combine qualitative and quantitative research methodology.

## Acknowledgements

The authors thank Malte Hager, Researcher at TU Berlin, for his excellent contribution on the extraction of the longitude and latitude of the Berlin University Startups, using the coding language Python.

## 1. Bibliography

Adler, P., Florida, R., King, K.M. and Mellander, C., (2019), “The city and high-tech startups: The spatial organization of Schumpeterian entrepreneurship”, *Cities* 87, p. 121-130, DOI: 10.1016/j.cities.2018.12.013

Amt für Statistik Berlin-Brandenburg (2019) *Einwohnerinnen und Einwohner im Land Berlin am 31. Dezember 2018*. Potsdam . Available at: [www.statistik-berlin-brandenburg.de](http://www.statistik-berlin-brandenburg.de) (Accessed: 13.05.2019).

Amt für Statistik Berlin Brandenburg (2018) *kleine berlin - statistik*. Statistik Berlin Brandenburg. Available at : <https://www.statistik-berlin-brandenburg.de/produkte/produkte-kleine-statistiken.asp> (Accessed: 01.05.2019)

BCG (2018), *BCG Greeces Startup Ecosystem*, [https://web-assets.bcg.com/img-src/BCG-Greeces-Startup-Ecosystem-Greek\\_tcm9-190747.PDF](https://web-assets.bcg.com/img-src/BCG-Greeces-Startup-Ecosystem-Greek_tcm9-190747.PDF) (accessed 26.06.2023).

CIESIN - Center for International Earth Science Information Network (2018) *Gridded Population of the World, Version 4 (GPWv4): Population Density, NY: NASA Socioeconomic Data and Applications Center (SEDAC)*. Available at: <https://sedac.ciesin.columbia.edu/data/set/gpw-v4-population-density-rev11> (Accessed: 04.06.2019).

Colombo, M.G. and Piva, E. (2008), “Strengths and weaknesses of academic start-ups: a conceptual model”, *IEEE Transactions on Engineering Management*, Vol. 55 No. 1, pp. 37-49.

Davila, A., Foster, G. and Gupta, M. (2003), "Venture capital financing and the growth of start-up firms", *Journal of Business Venturing*, Vol. 18 No. 6, pp. 689-709.

Davis, K. (1973), "Cities: their origin, growth, and human impact; readings from *Scientific American*", San Francisco: W. H. Freeman.

Diggle, P. J. (1983), "Statistical Analysis of Spatial Point Patterns", *Mathematics in Biology*, Vol. 2. Academic-Press, London - New York

Dealroom.co (2023), Berlin Startup Employment 2023, Senate Department for Economics, Energy and Public Enterprises. Available online: <https://dealroom.co/uploaded/2023/03/Berlin-Employment-Report-March-2023-V2.pdf>

Doukissas, L and Psycharis Y. (2020), "Location analysis of manufacturing activity in Greece: A point pattern analysis", *European Journal of Geography*, Vol. 11 (3), pp. 108-125.

Durantou, G. and Overman, H.G. (2005). Testing for Localisation Using Micro-Geographic Data. *Review of Economic Studies*. 72 (4): 1077-1106.

Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft, (2023a). EY Start-up-Barometer Europa, [https://assets.ey.com/content/dam/ey-sites/ey-com/de\\_at/noindex/content/2023/ey-start-up-barometer-europa-2022.pdf?mkt\\_tok=NTIwLVJYUC0wMDMAAAGMlloekhup1JOiMdKsXNXp79dE30xvlixYPzTHsOEYsJ0McWvnbDgRCLjikhEykBfuRTbnKSM4W1hBGcXnfF0-Px-K0\\_1\\_wDF5jYkvpbYx3F896Ju-Wcw](https://assets.ey.com/content/dam/ey-sites/ey-com/de_at/noindex/content/2023/ey-start-up-barometer-europa-2022.pdf?mkt_tok=NTIwLVJYUC0wMDMAAAGMlloekhup1JOiMdKsXNXp79dE30xvlixYPzTHsOEYsJ0McWvnbDgRCLjikhEykBfuRTbnKSM4W1hBGcXnfF0-Px-K0_1_wDF5jYkvpbYx3F896Ju-Wcw) (accessed 26.06.2023)

Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft (2023b). Startup Barometer Germany, [https://assets.ey.com/content/dam/ey-sites/ey-com/de\\_de/noindex/ey-praesentation-startup-barometer-januar-23-english.pdf?mkt\\_tok=NTIwLVJYUC0wMDMAAAGMlkMbFoaAT0ruH8Bt-QE0u5JBhaXkHaPORuQ4YL4LfAkoziiRREnDhxDGBdWeOaQSAAttSAOFcgPP-wAPXNtMEjYE53Fo4QKEuVB7W6E6lZkhT0zrCw](https://assets.ey.com/content/dam/ey-sites/ey-com/de_de/noindex/ey-praesentation-startup-barometer-januar-23-english.pdf?mkt_tok=NTIwLVJYUC0wMDMAAAGMlkMbFoaAT0ruH8Bt-QE0u5JBhaXkHaPORuQ4YL4LfAkoziiRREnDhxDGBdWeOaQSAAttSAOFcgPP-wAPXNtMEjYE53Fo4QKEuVB7W6E6lZkhT0zrCw) (accessed 26.06.2023)

Florida R (2014), "Startup City: The Urban Shift in Venture Capital and High Technology". Toronto: Martin Prosperity Institute.

Foundation (2022), Startups in Greece 2022-2023 <https://thefoundation.gr/2022/12/16/startups-in-greece-2022-2023-venture-financing-report/> (Accessed: 26.06.2023)

Fujita, M. and Krugman, P. (2004) "The new economic geography: Past, present and the future", *Papers in Regional Science* 83, 139-164, DOI: 10.1007/s10110-003-0180-0

<https://www.hochschulen-berlin.net/?language=en#:~:text=The%20city%20has%20five%20public.a%20wide%20range%20of%20disciplines> (accessed 26.06.2023).

Hotelling, H. (1929). Stability in competition. *The Economic Journal*. 39 (153): 41-57. DOI: 10.2307/2224214

Jacobs, J. (1970) "The Economy of Cities". London: Jonathan Cape.

Jonek-Kowalska, I and Wolniak, R. (2021), "The Influence of Local Economic Conditions on Start-Ups and Local Open Innovation System" *Journal Open Innovation Technology, Market and Complexity*, 7(2), 110; <https://doi.org/10.3390/joitmc7020110>

Kopczewska, K., Churski, P., Ochojski, A. and Polko, A. (2017), "Measuring Regional Specialization A New Approach". Palgrave Macmillan Cham.  
<https://doi.org/10.1007/978-3-319-51505-2>

Krugman, P. (1991), "Geography and Trade". MIT Press, Cambridge.

Lösch, A. (1954). *The Economics of Location*. New Haven: Yale University Press.

Marcon, E. and Puech, F. (2010). "Measures of the Geographic Concentration of Industries: Improving Distance - Based Methods". *Journal of Economic Geography*. 10 (5): 745-762. doi: 10.1093/jeg/lbp056

Martin, Ron L. 2011. "The New Economic Geography": Credible Models of the Economic Landscape?" In *The SAGE Handbook of Economic Geography*, edited by Leyshon, Andrew, Roger Lee, Linda McDowell, and Peter Sunley, 53 - 71. London: Sage

Matsaganis, M. (2013) *The Greek crisis: social impact and policy responses*. Available at: <http://library.fes.de/pdf-files/id/10314.pdf> (Accessed: 04.06.2019).

McCarthy, N. (2017) *The Capital's Economic Power, Statista*. Available at: <https://www.statista.com/chart/11515/the-capitals-economic-power/> (Accessed: 04.06. 2019).

Møller, J. and Waagepetersen, R.P. (2004). *Statistical Inference and Simulation for Spatial Point Processes*. New York: Chapman and Hall.

Mustar, P., Wright, M. and Clarysse, B. (2008), "University spin-off firms: lessons from ten years of experience in Europe", *Science and Public Policy*, Vol. 35 No. 2, pp. 67-80.

O'Sullivan, P. (1981), "Geographical Economics". Penguin Books, Middlesex, England.

Panori, A. and Psycharis, Y. (2018) *The impact of the economic crisis on poverty and welfare in Athens* *The impact of the economic crisis on poverty and welfare in Athens*, Région et Développement, 48.

Polander, T. (1935). *Beitrage Zur Standorts Theorie*. Upsala: Almqvist and Wiksells book tryckel.

Rashid, L. (2019), “Entrepreneurship Education and Sustainable Development Goals: A literature Review and a Closer Look at Fragile States and Technology-Enabled Approaches” *Sustainability* 2019, 11(19).

Sunley, P. (2000), “Urban and Regional Growth”. In *A Companion to Economic Geography*, edited by Sheppard E. and Barnes T.J., 187-201. Oxford: Blackwell Publishers, 2000.

Skala, A. (2019). *The Startup as a Result of Innovative Entrepreneurship*. In: *Digital Startups in Transition Economies*. Palgrave Pivot, Cham.  
<https://doi.org/10.1007/978-3-030-01500-8>

Spender, J.C. (2014), *Business Strategy: Managing Uncertainty, Opportunity, and Enterprise*, Oxford University Press, Oxford.

The Economist (2014), *A Cambrian moment*. Special Report on Tech Startups, 18 January

UN (2018), *68% of the world population projected to live in urban areas by 2050, says UN*  
<https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html>

Weber, A. (1909). *Über den Standort der Industrien*. Tübingen, Germany. Trans. Friedrich, C.F., 1929. *Alfred Weber’s Theory of Location of Industries*. Chicago: University of Chicago Press.

World Population Review (2019) *Athens Population*. Available at: <http://worldpopulationreview.com/world-cities/athens-population/> (Accessed: 4 June 2019).

ΠΕΠ Αττικής 2014-2020 (2019) *Στρατηγική Μελέτη Περιβαλλοντικών Επιπτώσεων Πεπ Αττικής Προγραμματικής Περιόδου 2014-2020*. Available at: [http://www.pepattikis.gr/wp-content/uploads/2016/03/SMPE-ΑΤΤΙΚΗ\\_2014-2020\\_FINAL.pdf](http://www.pepattikis.gr/wp-content/uploads/2016/03/SMPE-ΑΤΤΙΚΗ_2014-2020_FINAL.pdf) (Accessed: 05.06.2019).

