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Exploring Capital and Agglomeration Effects on Entrepreneurship

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Abstract – This paper aims at identifying the factors influencing the entrepreneurial activity level in Polish municipalities, paying attention to agglomeration, human capital, tourism, and social capital effects. The justification for this study is to determine how these factors affect the number of registered firms, especially in view of the fact that the culture of entrepreneurship is not evenly spread across the municipalities. The linear regression model is developed and tested for the data obtained from the Local Data Bank and Google with major focus on the methodological rigor; logarithmic transformation used to enhance fitness; and specification or heteroscedasticity tests. The results demonstrate that the higher levels of human capital and municipal location in the agglomerations increase the number of entrepreneurs, but the role of the human capital is significant (0.48% of increase in the creation of firms in 1% of higher education). Social capital also exerts a positive influence on the level of entrepreneurship by 0.07% for each percentage increase in this factor, while the influence of tourism is relatively low at 0.02% for each percentage increase in this variable. These related factors reveal some anomalies like the municipalities with negative values from tourism and educational centers. The study contributes a wealth of knowledge regarding the patterns of entrepreneurship within different regions and underpins the significance of human capital, social capital and agglomeration in driving the economy.

Keywords – Human Capital, Social Capital, Tourism, Agglomeration Effects, Entrepreneurial Activity, Knowledge Spillover, Entrepreneurial Culture.

I. INTRODUCTION

Over the last 20 years, entrepreneurship and its potential effects on the economy have been the subject of much study, but the discipline is continually expanding and developing. Empirical data in [1], and [2] consistently supports the notion that entrepreneurship has a substantial and beneficial influence on macroeconomics. This is shown in numerous studies, such as those conducted by Wong, Ho, and Autio [3]. Nevertheless, some empirical research such as [4] indicate that entrepreneurship might have a detrimental macroeconomic effect in certain circumstances. The intricate interplay among entrepreneurship and economic development offers possible reasons for these unreliable outcomes. A number of characteristics, including industrial affiliation [5], the degree of expansion of the nation, and the density of business owners in a given area [6], have been shown to have a major impact on the macroeconomic impact on entrepreneurship in early empirical research.

The fundamental instruments for the growth of municipalities include administrative, financial, institutional, conceptual, socio-psychological, and factual tools [7]. In recent years, wealthy nations in Western Europe have created a range of sophisticated tools for community and regional economic policy, leading to increased prospects for the division of instruments [8]. Tools that help the municipal economy and business may be differentiated based on their nature, level of influence, and target audience. The business environment is composed by various factors that exercise significant influence on the emergence of new firms as well as the current enterprise in the market. At the national level, the business climate is shaped by two key factors: the implementation of general policies and policies, taxes and bureaucratic procedures affecting the enterprises. On the municipal or regional level, the business climate entails other factors that may include the location of

the market and consumers, quality of human resource, sources of funds, materials, and technology, quality of infrastructure, and efficiency of the local authorities [9].

Poland can be used as an example for the analysis of the development and the achievements of social companies. The organization has vast experience in partnership and reciprocal activities and also has traditional practices of giving back to society [10]. The discussion about the role of social businesses in solving social problems has been enriched by the integration of Poland with the European Union. Moreover, the presence of a large amount of public funds and public policy has allowed for the experimentation of social entrepreneurship solutions. The past 15 years have seen the development of social economic development programs at regional, national and municipal level as well as the passing of necessary laws including the Social Cooperatives Act [11]. These activities involve the allocation of significant public funds to establish new organizations that integrate social and business goals, such as social cooperatives and non-profit companies. They also aim to streamline the operations of non-governmental organizations and promote this type of activity among different target groups in Poland.

The idea of knowledge spillover in business suggests that the degree of knowledge-based entrepreneurship is affected by the generation of new information and the presence of entrepreneurial absorptive ability to effectively use it [12]. The impact of knowledge spillovers and entrepreneurship is often believed to be influenced by variables such as a region's business policy and strategy, including start-up strategy [13] and public cluster policy [14]. Although the significance of new business creation in urban economic growth is acknowledged, a common topic in the current research is the need to promote cultural entrepreneurship [15] and social entrepreneurship [16] in cities. One instance of this concept may be seen in the typology put out by Short, Moss, and Lumpkin [17], where they used a contingency theory to elucidate the variations in the impacts of national policies on social entrepreneurship, invention, and the establishment of new ventures. According to Raszkowski and Bartniczak [18], political and socioeconomic improvements in Central and Eastern European (CEE) nations have decreased investment risk and allowed more advanced countries to have access to highly trained personnel at a much cheaper cost. These shifts led to higher-wage, developed nations being compelled to invest in the creation of novel firms and the conception of employment in technology-intensive and knowledge-based sectors.

The objective of this paper is to determine the reasons for the geographical imbalance of new business formations in Poland and understand the impact of social capital, human capital, tourism and agglomeration on firm formations. This knowledge defines factors of influence towards entrepreneurship and frames policy strategies required to advance economic growth in various areas. The remaining sections of this research has been arranged in the following manner: Section II presents a conceptual framework, which includes entrepreneurship, variables (agglomeration, social capital, tourism, and human capital), as well as hypothesis. Data and sources have been discussed in Section III. Section IV and V provides a detailed discussion of the results, which integrates human capital and entrepreneurship, agglomeration effects, and social capital and tourism. Lastly, a summary of the results has been provided in Section VI.

II. CONCEPTUAL FRAMEWORK

Entrepreneurship

Entrepreneurship has been defined in numerous ways in [19]. The classical school of entrepreneurship focused on the entrepreneur's ability to introduce new ideas and willingly accept the potential for financial loss [20]. The idea of business is based on the entrepreneur's role in coordinating the components of production, as well as their daring and invention [21]. According to Bhave [22], company formation is the visible expression of entrepreneurship, but Krueger, Reilly, and Carsrud [23] suggest that the process of creating a business via entrepreneurship is deliberately planned. Although entrepreneurial action is influenced by planned behaviour, it is now clear that the success or failure of business start-ups and entrepreneurship in general is also affected by a combination of individual and contextual factors.

Variables

Human Capital

The significance of human capital in the sector of business has been recognized for a long time and has seen a significant increase in attention over the last twenty years. The idea of human capital theory emerged to examine the economic worth of education and posits that individuals possess diverse knowledge and skills that have economic significance. In 1958, Mincer was the first to introduce the notion of human capital as a means of explaining income inequality. Martin, McNally, and Kay [24] noted that the growth in national production was not in proportion to the amount of land, work hours, or physical capital. He suggested that the key reason for this discrepancy is the investment in human capital. Becker expanded upon these perspectives and developed the theory of human capital investments, drawing on a substantial body of study that demonstrates how those with higher levels of education and skills generally earn higher incomes compared to others.

Social Capital

Within the model of entrepreneurial endeavours, social capital encompasses three main elements. These categories are known as structural, cognitive, and relational social capital [25]. Each of these characteristics plays a crucial role in conceptualizing how people shape their social environment and use social connections to get entrepreneurial benefits in society. Structural social capital refers to the existence of roles, and precedents that guide people into networks and shape the structure of a network configuration [26]. Relational social capital refers to the specific place and situation where a person

might benefit from forming social connections. It can be stated as the extent to which an individual is incorporated into social networks [27]. Relational social capital refers to the connections established among groups of people via interpersonal contact, whereas structural social capital refers to an individual's position and benefits within their social networks.

Tourism

Tourism is a significant economic activity in many nations since it has a profound influence on the economy, community development, quality of life, and preservation of natural resources [28]. The economic implications may have both good and bad effects. The positive benefits mostly revolve around the produced revenue, while the most notable negative aspects include inadequate infrastructure, public services, and housing, among other factors [29]. The COVID-19 pandemic amounted in a major decline in tourist revenue in 2020, which was ten times more than the economic crisis experienced globally in 2009 [30]. Clearly, the pandemic has had a substantial impact on tourist enterprises and the financial well-being of their employees. In Madeira, the unemployment rate among the working population was 45%. Hungary saw a loss of 41,500 jobs, while in Jamaica, about 300,000 individuals were reported to have been jobless [31]. The recovery process will occur gradually over the medium term. Some of the primary obstacles to achieving this recovery are travel restrictions, the gradual containment of the virus, and poor consumer confidence [32].

Agglomeration

Entrepreneurial agglomeration refers to the concentration of entrepreneurial activities in a certain area. Therefore, much research on the creation of agglomeration focuses on establishing the links between individuals' career decisions and the unique features of various agglomerations. Based on previous research, the new career chooser will base their decision on various criteria, including internal factors such as their experience advantages [33], attitudes [34], risk-taking abilities [35], inclination towards a specific career type [36], and future career expectations [37]. Additionally, external factors such as regional opportunities [38], favorable environment [39], and social status [40] may also influence their decision. While the ultimate job selection is influenced by both internal and external variables, previous studies have mostly assumed that the individual is well educated prior to making their decision, whether by personal efforts, social ties, or exposure to new business models.

Hypothesis

According to the idea of human capital [41], education enhances the abilities of individuals, leading to increased productivity in the workforce. Additionally, discrepancies in wages are believed to be a reflection of variations in productivity levels. Consequently, on the assumption that all other factors remain constant, workers with a higher level of education would get higher salaries due to their greater productivity compared to people with less education. Empirical and theoretical research on labor markets has contested this account of wage disparity. Various labor market theories propose that inequality may stem from factors other than labor productivity, like labor market institutions, collective action, or the use of power and authority to gain economic benefits [42]. While each of these theories on inequality examines different social processes, they all seem to agree that labor market disparity is linked, either explicitly or indirectly, to an unfair or undeserved distribution of resources to dominating groups. There is a positive connection among the amount of education and skills in a municipality and the likelihood of persons starting and maintaining enterprises. This is because people with higher education and skills are able to use their knowledge and abilities to their advantage [43].

Hypothesis 1: There exists a direct correlation between the amount of human capital present in a municipality and the quantity of registered firms within that municipality.

The influence of networks on our social and economic connections has been empirically confirmed in terms of cooperation, and networks may have a substantial effect on contemporary shared relationships as well. For example, the network might enhance the prospects for cooperation for some users while hindering them for others, or exacerbate inefficiencies in sharing in different ways. Gaining insight into the characteristics of socio-technical networks that enable sharing is crucial for the development of effective and widespread sharing systems. However, there is a scarcity of research that have investigated the collective impact of technological specifications that regulate social interactions and the behavior of individuals involved in sharing resources via networks. Trust is crucial for developing and maintaining positive interpersonal relationships, promoting civic participation, ensuring fair access to resources, addressing health inequalities, and encouraging collaboration among community members and local authorities. These factors are essential for the efficient functioning of society. Robust social networks and a high level of community trust may enhance the exchange of resources and knowledge, therefore bolstering entrepreneurial endeavors [44].

Hypothesis 2: The occurrence of social capital positively impacts the quantity of businesses within municipalities.

Entrepreneurship in the tourist sector is crucial for the economic growth of nations and their local areas. Furthermore, it is widely recognized as a means of promoting economic growth in disadvantaged and vulnerable areas, prompting several nations to actively support the establishment of this sector in underdeveloped regions [45]. Hence, the scientific community has recognized the significance of tourism entrepreneurship, leading to a surge in literature dedicated to this field of study. This literature encompasses a diverse range of topics that are applicable to different sectors within the tourism industry.

Undoubtedly, professionals in the area have thoroughly evaluated the difficulties that sustainability presents to tourist entrepreneurship. At now, there is a growing body of literature that examines the convergence of knowledge from business, sustainability, and tourism. Tourism has the potential to provide economic possibilities in the hotel, retail, and allied service sectors, hence promoting entrepreneurship [46].

Hypothesis 3: Municipalities exhibiting a higher degree of tourist activity have a correspondingly larger quantity of firms.

Agglomeration economies refer to the increased productivity and reduced costs that occur when industries and enterprises cluster together in a certain geographic area. This notion was first introduced by economist Alfred Marshall in the 19th century [47]. Marshall noted that certain sectors had a tendency to cluster in specific geographic areas, suggesting that being close to one another has its benefits. The benefits were defined by three essential components: a nearby proficient workforce, local dissemination of information, and local connections in the supply chain. The concept of agglomeration economies was further investigated in the Sheffield cluster, revealing that firms often located themselves in close proximity to their customers or suppliers in order to save transportation expenses. Agglomeration economies facilitate company establishment by providing close proximity to suppliers, consumers, and a highly qualified workforce, resulting in reduced operating expenses and increased encouragement for entrepreneurial endeavors [48].

Hypothesis 4: A municipality's number of firms is positively correlated with agglomeration effects.

III. DATA AND SOURCES

Data Sources

Linear reversion model was constructed by use of least squares approach to validate the majority of the assumptions. It provides unbiased and efficient estimators as long as the expectations of the Standard Linear Reversion Model are satisfied. Analyzed were all metropolises in the nation. The study primarily relied on data from the Local Data Bank, supplemented by data gathered from Google. Additionally, some dummy constants were developed depending on the specified criteria. Examining tourism municipalities posed a significant challenge. To generate an explanatory variable, it was essential to manually copy the findings from the Google webpage for each observation. However, all efforts to get the data automatically were hindered by the program.

Simultaneously, when transferring the findings, the method of data representation has shifted from precise data to using ranges denoted as “from – to”. The modification was implemented after the data for the primary unusual observations had already been sent to the database. Unfortunately, the existing method of data display does not allow for the creation of a comparable database. According to the data analysis, 10 out of the 20 recordings with high scores for the number of businesses per 10,000 people in the nation are tourist destinations. They selected very large ethics for the descriptive variable. Thus, to ensure organizational accuracy, logarithmic variables were included into the regression model, resulting in an improvement in the fitting quality. Tests were done to assess the accuracy of the network specification (RESET test) and to determine whether the variance of the random error is homoscedastic using the Breusch-Pagan test. There is a connection among the human capital and tourist variable.

Regression

The valued model may be documented for the i^{th} reflection unit in the following manner: The equation represents the relationship between enterprises ($Firms_i$) and many factors including human capital ($HumanCapital_i$), social capital ($SocialCapital_i$), tourism ($Tourism_i$), agglomeration ($Agglomeration_i$), voivodship ($Voivodeship_j$), and an error term ($\in_i$). The coefficients β_1, β_2, β_3, and β_4 represent the impact of each factor on the number of initiatives. The quantity of “initiatives” that are listed in the REGON database for every 10,000 municipality residents is the dependent variable. The dependent variable's value was estimated using the following predictors: tourism, determined by the number of Google search results for names of municipality per resident and its inclusion or exclusion within the agglomeration surrounding the voivodship capital; social capital, denoted as the relations in the metropolis per 10,000 residents; and human capital, expressed as the proportion of participants with a high knowledge in minicipalities. The remaining components of the proposed model are understood in the following manner:

$$In(Firms_i) = \beta_0 + \beta_1 In(HumanCapital_i) + \beta_2 In(SocialCapital_i) \quad (1)$$

$$+\beta_3 In(Tourism_i) + \beta_4 Agglomeration_i + \sum_{j=1}^{n} y_j Voivodeship_j + \in_i \quad (2)$$

IV.RESULTS AND DISCUSSION

According to **Table 1**, the regular number of firms per 10,000 residents in Poland is 778, which illustrates a highly right-skewed distribution of the dependent variable, with the majority of observations (municipalities) concerted towards the lower end of the distribution. **Fig. 1** illustrates the circulation of the dependent variable, while **Table 1** displays its characteristics. Out of the total of 2458 municipalities, which accounts for 99% of the explanations, the number of enumerated firms does not surpass 2,000 per 10,000 population.

Table 1. No. of Companies in Municipality and Characteristics of Variable Circulation

Variables	Mean	Standard Deviation	Skewness	P = 50	Minimum	Maximum	N
Firms	778.3	343.7	5.1	708.5	283.2	7691.5	2477

Simultaneously, a limited number of explanations deviate significantly from the mean of the circulation. The municipalities shown in **Table 2** below have extreme values within this range. The towns that are well-known centers of mountain (Zakopane, Karpacz) and coastal tourist (Władysławowo, Mielno, Międzyzdroje, Jastarnia, Rewal, Krynica Morska, Łeba) tourism are among the main anomalous observations. The municipalities that make up an agglomeration, particularly Poznań and Warsaw, fall into another group. Poland's two metropolises with the largest percentage of residents with postsecondary knowledge are Sopot and Podkowa Leśna, which are part of an agglomeration. Podkowa Leśna`s high score presents a compelling argument. The town is characterized by a notable degree of enterprise, albeit in the absence of available investment sites. Interviews done in Podkowa Le´sna revealed that the primary competency of this municipality is its ability to recruit “highly valuable” inhabitants.

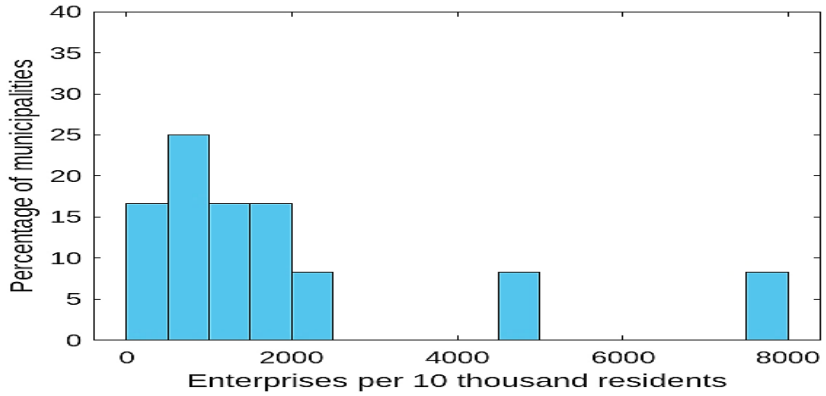

Fig 1. Distinct Circulation of the Number of Firms in The Municipality. Source: Self-Generated.

Numerous corporate presidents, entertainers, and artists who associate themselves with this town dwell there and thereby contribute financially via tax payments. The case of Podkowa Le´sna highlights the crucial factor in determining the municipality chosen by high-value taxpayers, which questions what influences the decisions to reside there.

Table 2. No. of Businesses in The Municipality Highlighting Any Unusual or Abnormal Findings

Municipality	No. of firms per 10,000 individuals	Municipality type
Karpacz	7690	Tourists (mountains)
Krynica Morska	3586	Tourists (sea)
Puszczykowo	2001	Agglomeration (near Poznah)
Tamowo Podgome	2045	Agglomeration (near Poznah)
Rewal	3526	Tourist (sea)
Michalowice	2058	Agglomeration (near Warsaw)
Leba	3480	``
Zakopane	2087	``
Jastarnia	2957	Tourist (sea)
Mielno	2855	Tourist (sea)
Suchy Las	2156	Agglomeration (near Poznah)
Lomianki	2165	Agglomeration (near Warsaw)
Ustronie Morskie	2718	
Warsaw	2209	Agglomeration
Lesznowola	2703	Agglomeration (Warsaw)
Podkowa Lesna	2252	``
Miedzyzdroje	2699	Tourist (sea)
Sopot	2305	``
Dziwnow	2318	``
Wladyslawowo	2406	``

Figs. 2 – 4 demonstrate the circulation of three distinct variables: social capital, tourism, and human capital. **Table 3** displays the circulation constraints for the variables mentioned previously.

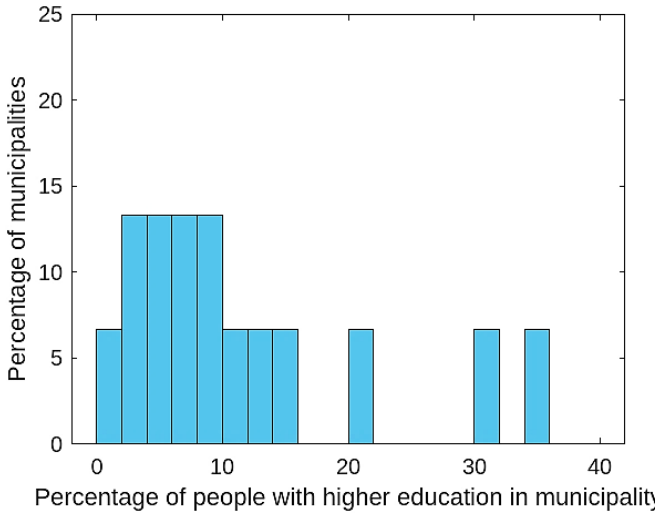

Fig 2. The Circulation of The Variable "Human Capital." Source: self-generated.

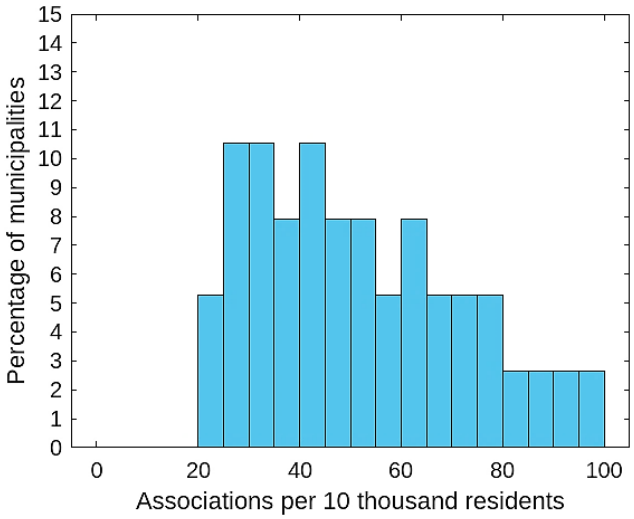

Fig 3. The Circulation of The Variable "Social Capital." Source: Self-Generated.

The Figures (**Figs. 2 – 4**) clearly demonstrate that social capital, human capital, and tourism have distributions that are skewed to the right, with a large tail on the right side and a majority of observations clustered around the lowest (and center) value of the circulation.

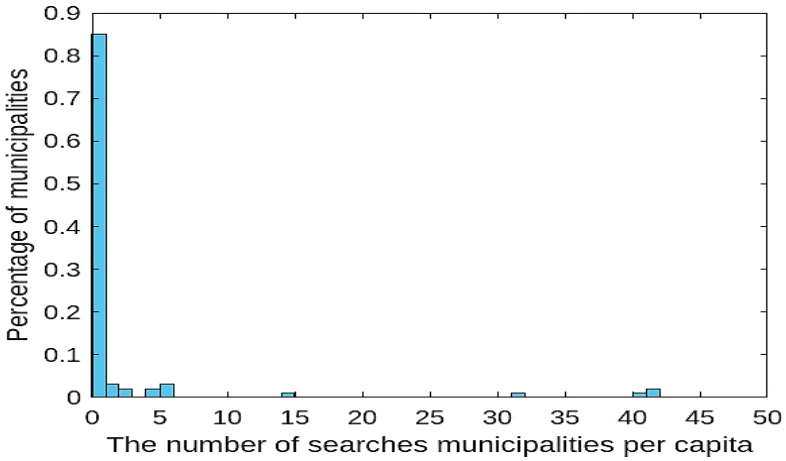

Fig 4. The Circulation of Variables Related to Tourism. Source: Self-Generated.

This is further supported by the affirmative ethics of the skewness constant indicated in **Table 3**. Tourist municipalities such as Białowie˙za or Mielno typically exhibit unusual patterns of having a high number of associations in proportion to their population. In some communities, the organizations not only maintain the legacy of the "small homeland," but also fulfill responsibilities assigned by the metropolis, particularly in managing tourist traffic. This variable is mostly influenced by communities linked to mountain tourist rather than beach tourism. The second conspicuous category consists of communities with a significant amount of human capital like Warsaw or Sopot.

Table 3. Distribution Characteristics For Social Capital, Human Capital and Tourism

Variable	SD	Average	Median	Skewness	Max	Min	N
Human capital	3.145	5.244	4.106	2.3643	33.531	1.613	2478
Tourism	1.5549	0.71549	0.40327	14.885	45.318	0.00744	2478
Social capital	10.398	29.856	28.525	1.2565	105.22	6.995	2478

According on whether the municipality is a part of an agglomeration or not, **Table 4**, which is shown below, displays the conditional parameters of the described variable's distributions. As demonstrated by the data presented in **Table 4**,

agglomeration-affiliated metropolises have significantly higher rates of entrepreneurship than non-agglomeration-affiliated metropolises.

Table 4. Dependent Variable's Distributions with Respect to Agglomeration

Variables	SD	Average	Median	Skewness	Max	Min	N
Agglomeration	373.81	1051.4	979.26	1.6687	3588	428.25	402
	311.02	725.39	672.29	7.2847	7691.5	283.15	2076

The average number of enumerated firms for the first group of metropolises is 1051, whilst the average for the second group is 725. The relation among the dependent variable and the continuous independent component is shown in **Figs. 5 – 7**. The linear link mong entrepreneurship and human capital is evident from the two-variable correlations given, as seen in **Fig. 5**.

Table 5. Estimates of Model Constraints For Logarithms, Namely The Non-Standardized Constants

Source	df	SS	MS		Number of obs = 2478	
aglomeracja	0.0107977	0.1294518	11.98	0.0001	0.108278	0.150626
_cons	0.0434177	5.824715	134.16	0.000	5.739576	5.909854
In_turystyka	0.0037002	0.0207121	5.60	0.000	0.0134563	0.0279679
Wielkopolskie	0.0202305	-0.072992	-3.61	0.000	-0.1126627	-0.0333213
hel	0.1771875	0.3055209	1.72	0.85	-0.0419316	0.6529734
warminskomazurskie	0.0232286	-0.3060869	-13.18	0.000	-0.3516366	-0.2605372
Krynica_morska	0.1777555	0.9267026	5.21	0.000	0.5781364	1.275269
swietokrzyskie	0.0239911	-0.379606	-15.82	0.000	-0.4266509	-0.3325611
karpacz	0.1769733	1.63965	9.26	0.000	1.292618	1.986683
slaskie	0.0217404	-0.175176	-8.06	0.000	-0.2178074	-0.1325445
dolnoslaskie	0.02135	-0.0489085	-2.29	0.022	-0.0907743	-0.0070427
pomorskie	0.0229874	-0.0885853	-3.85	0.000	-0.133662	-0.0435086
kujawskopomorskie	0.022178	-0.1929891	-8.70	0.000	-0.2364785	-0.1494996
podlaskie	0.0231601	-0.408201	-17.63	0.000	-0.4536164	-0.3627856
lodzkie	0.0211859	-0.2436181	-11.50	0.000	-0.2851622	-0.2020739
podkarpackie	0.0216074	-0.437788	-20.26	0.000	-0.4801585	-0.3954174
lubelskie	0.0204643	-0.4391659	-21.46	0.000	-0.479295	-0.3990368
opolskie	0.0266379	-0.1957349	-7.35	0.000	-0.24797	-0.1434998
lubuskie	0.0258805	-0.1547316	-5.98	0.000	-0.2054815	-0.1039817
mazowieckie	0.0193644	-0.2285004	-11.80	0.000	-0.2664726	-0.1905282
malopolskie	0.0211241	-0.1908125	-9.03	0.000	-0.2322354	-0.1493896

The connections among the other parameters, namely entrepreneurship and social capital, seem to be less evident based on **Fig. 6** and **7**. All three figures exhibit anomalous observations that are significantly different from the other surveillance units. Converting all constant variables in the framework to logarithms has resulted in a substantial statistical link between the independent variables and entrepreneurship, with the exception of the Hel observation see to **Table 5**.

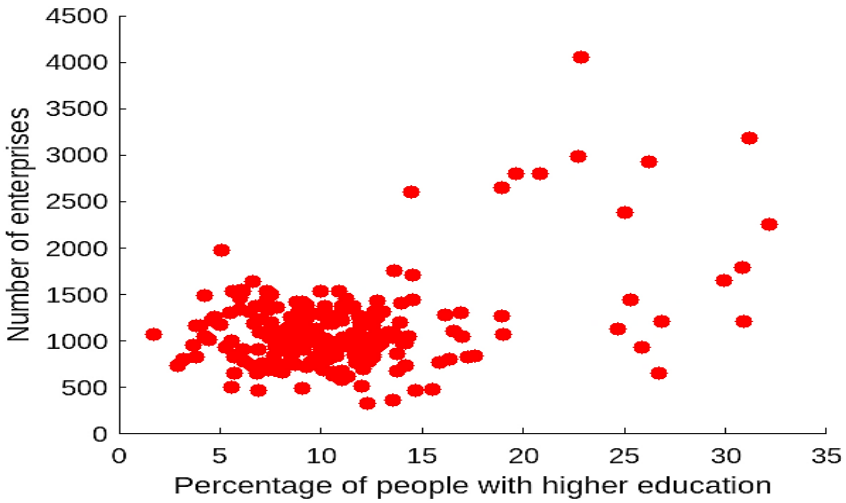

Fig 5. Correlation Between Human Assets Level and the Number of Companies in a Municipality.

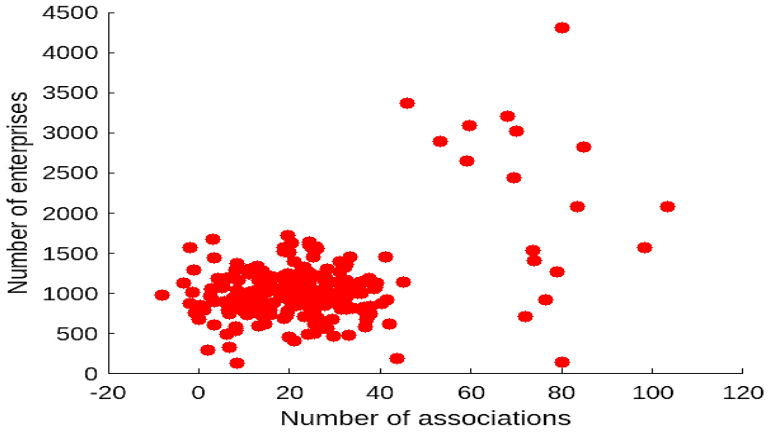

Fig 6. Correlation Between the Number of Firms in A Metropolis and its Social Capital.

An increase of 1% in social capital levels in a metropolis leads to a corresponding surge of 0.07% in the number of enumerated firms. The estimated value for the assortment variable is 0.14. Therefore, a transition of this variable from 0 to 1 will result in a 14% augmentation in the quantity of businesses officially recorded in a certain municipality. The reference category for comparisons in the variable of voivodeship is the Zachodniopomorskie voivodeship, which is characterized by the highest entrepreneurship constant. The negative coefficient estimates for specific voivodeships demonstrate how the other voivodeships' levels of entrepreneurship differ negatively from it. With a 44% difference, the Lubelskie and Podkarpackie voivodeships exhibit the most negative divergence from the level seen in the Zachodniopomorskie voivodeship. Conversely, the Dolno´sl ˛askie and Wielkopolskie voivodships have the smallest negative deviations, with a decrease of 5% and 7% respectively. In comparison to the Zachodniopomorskie voivodeship, the Mazowieckie voivodeship's number is especially striking, indicating a huge decline of 23%.

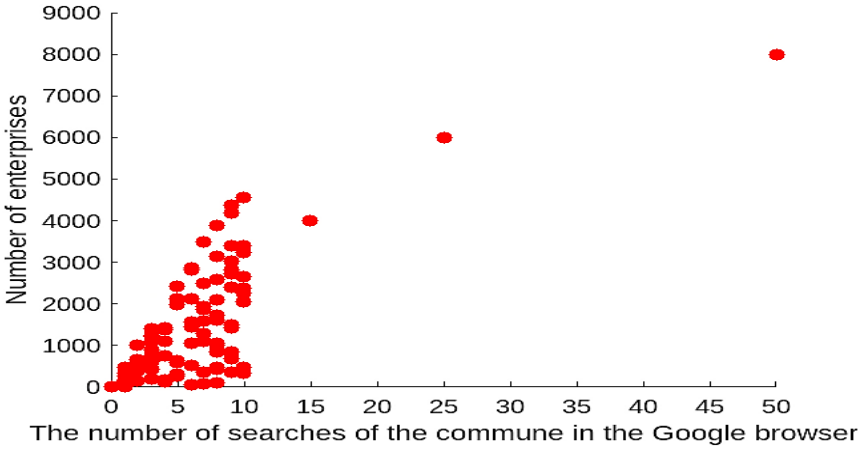

Fig 7. Quantity of Businesses Within A Metropolis in Connection to The Tourist Industry.

Two separate regions may be identified within the Mazowieckie voivodeship: the Warsaw agglomeration and the remaining portion, which is ascetically advanced relative to the rest of the nation. If the proportion of individuals with higher knowledge in the metropolis, known as human capital, grows by 1% compared to its starting value, there will be a corresponding 0.48% rise in the number of organizations in the municipality, which is equivalent to half a percent. Since human capital has a major effect on initiatives enumerated in the metropolis, the computed correlation is highly significant. However, the impact on tourism is far less pronounced. A 1% surge in the value of this constant is only linked to a 0.02% growth in the number of firms (equivalent to two hundredths of a percent). The conducted studies have verified an impactful and numerically substantial link among the number of firms per ten thousand people in a municipality and the factors of *H1* (human capital), *H2* (social capital), *H3* (tourism), and *H4* (agglomeration).

V. DISCUSSION

The results of this research provide important and new information on the variables affecting the degree of entrepreneurship in Polish local governments, with a focus on agglomeration, social capital, tourism, and human capital. The findings suggest that human capital is likely to have the greatest influence on the number of enumerated firms, with agglomeration effects following closely after. Social capital and tourism, while less influential, nonetheless have significant benefits.

Human Capital and Entrepreneurship

The robust positive link between entrepreneurship and human capital is in line with earlier study, which repeatedly emphasizes the significance of knowledge and skills in promoting entrepreneurial endeavors [49]. Researchers in the field of business have examined how human capital influences the results of entrepreneurship at many levels of study, including the person, group, and venture levels. For example, Davidsson and Honig [50] explored the link at the individual level, Tasheva and Hillman [51] at the group level, and Lee [52] at the venture level. Previous studies have extensively examined the varying effects of human capital and particular or task-related human capital. For instance, researchers such as Dickson, Solomon, and Weaver [53], Foucault [54] and Ghura et al. [55] have explored this topic. Hogendoorn et al. [56] conducted a recent meta-analysis, which revealed that task-related human capital has a significantly stronger association with entrepreneurial performance compared to general human capital. However, it is substantial to note that both correlations are considered to be small.

The idea of human capital has been the subject of ongoing discussion since its introduction in the field of economic development. Various economists diverge from this view by emphasizing the significance of human capital in business. Within the framework of Polish towns, the presence of a proficient workforce is likely to minimize the obstacles for new businesses to access the market, therefore enabling a greater rate of company establishment. This discovery implies that towns with greater levels of human capital are more capable of promoting entrepreneurship, which supports the assertions of Marvel and Lumpkin [57]. They argue that capitalizing in human capital is crucial for economic development and innovation. The term “human capital” is often linked to the characteristic of entrepreneurship. Individuals with exceptional potential are more inclined to identify and participate in exceptional possibilities for entrepreneurship [58]. Knowledge generation has the potential to result in improved solutions [59] that may enhance the expansion of a company. The presence of sufficient venture capital is crucial for supporting start-ups, especially in the field of finance. This is shown by the influence venture money has on the sales development of high-tech entrepreneurial firms. Moreover, the study's results align with the study done by Volkmann et al. [60], which demonstrated that cities with greater levels of human capital have stronger entrepreneurial ecosystems.

Agglomeration Effects

The prominent influence of agglomeration in fostering entrepreneurship is also consistent with the body of acquaintance in the sectors of urban economics and economic geography. In [61], the idea of agglomeration economies primarily revolves on static efficiency, namely economies of scale and the ability to access inputs and markets. According to Ojaleye and Narayanan [62], backward and forward links are often characterized in relation to derived or induced demand. The significance of these agglomeration benefits is decreasing in contemporary domestic and global competitiveness. With the decrease in costs associated with accessing distant markets, several firms now engage in early-stage exporting. As a result, sales made outside of their home state or province make up the bulk of their overall sales. Acquiring inputs from several places is increasingly the norm. Due to the effective provision of inputs from a distance, having them available at home no longer provides a significant competitive advantage.

Agglomeration is the process of enterprises gathering together in a certain geographical location. Agglomeration economics refer to the processes that lead to the spatial concentration of labor and companies. Agglomeration economies arise when several enterprises engaged in the production of identical or complementary items cluster together, resulting in beneficial external effects for these firms [63]. Agglomeration economies can be separated into two primary categories: urbanization economies, which result from the total density of economic activity in a particular area, and localization economies, which result from the concentration of industries [64]. Agglomeration economics, as emphasized by Artz, Kim, and Orazem [65], pertain to the advantages that companies and employees get when they are situated in close proximity to one another. The advantages of agglomeration economies may be succinctly described via three mechanisms: sharing, matching, and learning. Companies get advantages from the collaborative use of buildings, infrastructure, suppliers, and a workforce. Companies and employees may more effectively align their talents and requirements in a bigger or more specialized workforce.

Furthermore, bigger markets provide organizations with a greater opportunity to acquire knowledge about new technology and business processes [66]. Agglomeration impacts in Polish municipalities are most noticeable in metropolitan areas with a high concentration of economic activity. The results indicate that towns located inside agglomerations are prone to exhibit a greater concentration of businesses as a result of these benefits. This evidence suggests that being close to bigger markets and having existing firms nearby may provide a favorable environment for the development of new operations [67].

Social Capital and Tourism

Strong interpersonal connections, such as those within families, may create a kind of social capital known as bonding social capital. This type of social capital can influence an individual's cognitive dimension, shaping their values, beliefs, and level of trust, which in turn can impact their personal perspectives. Therefore, the values acquired by interacting with family or friends who are entrepreneurs would result in more positive judgments of the attractiveness or feasibility of starting a business. However, cognitive social capital, which is built on weak connections, may still lead to positive attitudes and beliefs towards a certain activity, such as starting a new business. Consequently, it would have a beneficial impact on the

way attractiveness and feasibility are regarded. The effect would be amplified when these weak connections originate from the individual's associations with certain networks, such as entrepreneurial promotion agencies or entrepreneurial networks. Individuals who are not entrepreneurs might establish contact with these types of companies via various means. For example, individuals may be notified by others of their presence and roles. Individuals who are not entrepreneurs may also find themselves compelled to create direct communication with these organizations for various reasons, such as fulfilling their job responsibilities within a company or due to their involvement in work related to one of these organizations.

The reduced impact of social capital on entrepreneurship reported in this study contradicts earlier studies that emphasized the significance of social networks, trust, and community involvement in promoting entrepreneurial endeavors [68]. A potential reason for this inconsistency may be the difficulties in measuring social capital, since quantifying social networks and their efficacy in facilitating company formation is typically a complex task. Nevertheless, the discovery that social capital continues to have a beneficial impact, although a lesser one, on entrepreneurship indicates that local networks and community support do have an influence, albeit it is not as significant as human capital or agglomeration. These findings align with the study conducted by Alghababsheh and Gallear [69], which indicates that while social capital is significant, its influence may be diminished by other variables such as the presence of trained workforce and economic infrastructure. Likewise, the influence of tourism on entrepreneurship, while existing, is not as potent as anticipated. The reason for this might be attributed to the cyclical and unpredictable characteristics of the tourist industry, which can result in less secure conditions for entrepreneurs [70]. In towns where tourism plays a prominent role in the economy, firms may be more vulnerable to external disruptions, which might make entrepreneurship less appealing compared to locations with more secure economic foundations.

VI. CONCLUSION

The results of this research determine the factors that determine the level of commerce in Polish metropolises. According to our regression analysis, human capital has the strongest effect on the quantity of registered firms; with 1% increase in higher education enrolment leading to 0.48% increase in the number of firms. This goes to show that the key to the promotion of entrepreneurship lies in an educated populace. Moreover, the level of social capital has a positive impact on commerce which means that with each 1% increase in social capital, there is a 0.07% increase in firms. This implies that active community organizations and associations are supportive of the development of the economy. On the other hand, tourism contributes a very small role with a decrease of 0.02% suggesting that though it may help increase local economy, it has a very minimal impact on the number of organizations. The research also shows that agglomeration is important because the economic clusters or municipalities have higher levels of entrepreneurial activity, which has increased the number of firms by 14%. This implies that the economic clusters offer a favourable ground for business development. These outliers like the municipalities with high values (because of tourism or because of high education levels) highlight the fact that there is a need for targeted policies. They enlighten policy choices and development approaches in territories to concentrate on building human capital, capitalising on neighbourhood externalities, and fostering social capital to support and sustain entrepreneurship.

CRediT Author Statement

The author reviewed the results and approved the final version of the manuscript.

Data Availability

The datasets generated during the current study are available from the corresponding author upon reasonable request.

Conflicts of Interests

The authors declare that they have no conflicts of interest regarding the publication of this paper.

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