ENTREPRENEURSHIP DEVELOPMENT IN UKRAINE: FACTORS AFFECTING SMALL AND MEDIUM BUSINESSES FORMATION ON THE REGIONAL LEVEL

by

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LIST OF ABBREVIATIONS

BMI Business Monitors International agency

SSSU State Statistical Service of Ukraine

WHO World Health Organization

SME Small and Medium Enterprises

R&D Research and Development

CHAPTER 1. INTRODUCTION

The topic of small and medium entrepreneurship has been an important part of Ukraine's effort to build an economically resilient and developed country. Small and medium-sized enterprises along with individual entrepreneurs are considered as the backbone of modern economies. The role of entrepreneurship in the process of national, regional and local development has been an important topic of empirical studies in recent years. Considering Ukraine's transition to a market economy, the idea of supporting and encouraging the development of small and medium enterprises and entrepreneurs (SMEs) has gained a very important part in the national development strategy. The Cabinet of Ministers of Ukraine in its National economic strategy for the period until 2030 mentions "economic freedom where the entrepreneur is the basis of the economy" and "development of entrepreneurship, innovation and talents" as among the government's main principles and values in economic policy.

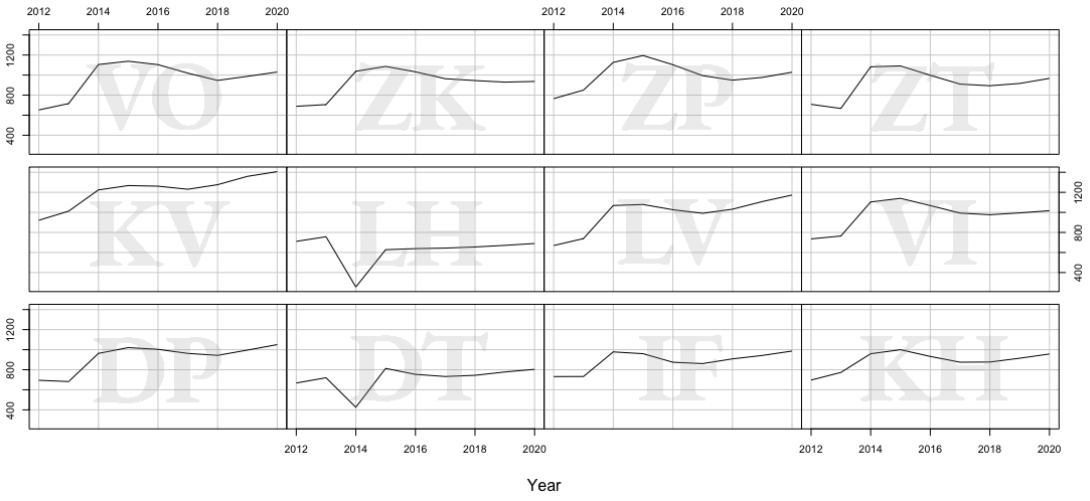
There have been studies conducted by Ukrainian scholars who explore the relationship between entrepreneurship and economic growth, particularly the role of small and medium businesses on economic development at the national and regional levels (Romanovskyi, 2013; Romaniuk, 2019). However, there have been few empirical studies that investigate what factors can influence the creation of small and medium enterprises on the regional level.

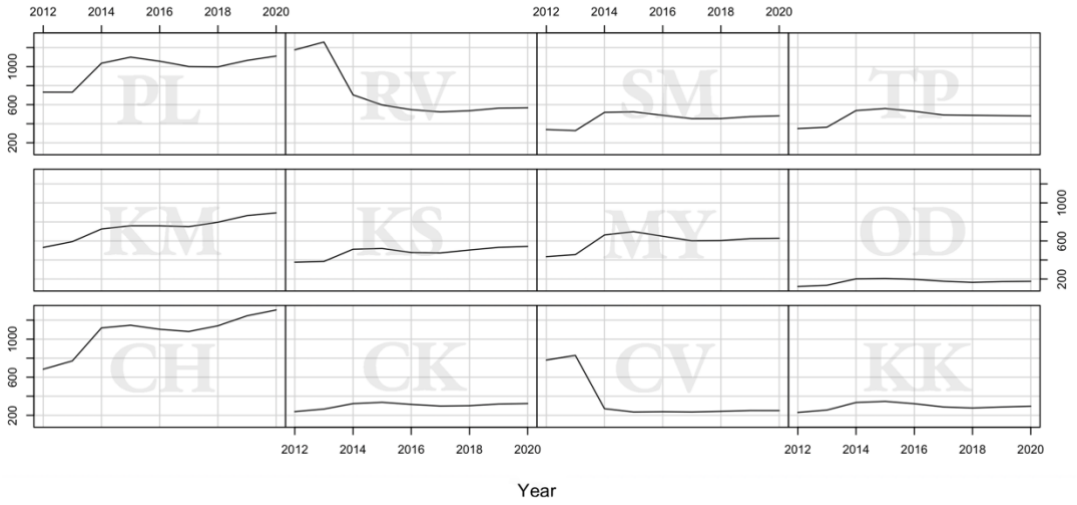
Understanding the exogenous factors that can have an effect on the number of entrepreneurs on the regional level is also important for owners of operating businesses as well as for potential entrepreneurs who are planning to start their businesses. On the regional and local levels, the central government is also implementing policies to encourage the creation of new businesses and support the existing ones. Since the start of the decentralization reform that gave more powers and responsibilities along with

financial resources to the regional and local governments, the topic of economic development has become an important part of local and regional governments' agenda. According to the analytical report "Problems and needs of Ukrainian small and medium-sized enterprises in the war conditions", small and medium businesses generated 60% of the national GDP, and provided about 7 million jobs and 40% of tax revenues in 2021. Thus, the support of SMEs has become an important pillar of national as well as regional governments' work in the economic development of the country.

In Figure 1, the data on the number of enterprises per 10 000 people in each region (codes for regions are available in Appendix A) is presented where certain trends can be observed. Firstly, in the period from 2012 to 2014, a rise in the number of SMEs in almost every region can be seen. This can be explained by the Global Financial Crisis of 2008 that was still affecting Ukraine's economy in 2010-2011 and from 2012 up to 2014 the economy started to recover. However, with the start of the war with russia and the annexation of Crimea, the economic situation worsened again. The effect was different for each region as seen in Figure 1.

Figure 1. Number of small and medium businesses per 10 000 people in 24 regions from 2012 to 2020





Source: SSSU

During the period from 2016 to 2020 in almost every region the number of entrepreneurs did not change drastically. Besides these macro-level shocks that are observed in the graph, there are other exogenous factors that can influence the development of entrepreneurship on the regional level.

Thus, this paper attempts to identify the set factors and find their effect on the number of enterprises and individual entrepreneurs through panel data analysis. The data is collected on Ukrainian regions from open resources for the period from 2012 to 2020. The analysis showed that variables on gross regional product, expenditures on research and development, and regions' revenue have statistically significant effects on the number of individual entrepreneurs while average monthly salary and expenditures on capital investment showed negative effects. Additionally, the effect of the variables was estimated separately for small and medium enterprises where only the number of large firms and salary have significant effects. Based on the findings of this analysis, recommendations that can be useful both for the business community and government institutions are provided. Insights and suggestions for future research in this area are also discussed.

CHAPTER 2. LITERATURE REVIEW

As this paper tries to explore the factors that can influence the entrepreneurial activity of regions in Ukraine, first it is important to decompose the concepts of "entrepreneurship". To identify the exogenous factors the effect of which will be determined, an overview of similar studies will be performed.

The topic of entrepreneurship has been widely studied in the economic literature that has produced numerous definitions of the term entrepreneur and entrepreneurship (Herbert & Link, 1989). Herbert and Link (1989) have identified at least twelve distinct themes in the economic literature where the definition of an entrepreneur ranges from "a person who assumes the risk associated with uncertainty", "an innovator" or "an industrial leader" to "the owner of an enterprise". Schumpeter (1911) linked entrepreneurship with economic development and economic cycles where the entrepreneur is an innovator who is engaged in the process of creative destruction. In the recent economic literature, entrepreneurship has been defined "as the act of generating and developing an idea for validation" (Prince et al., 2020).

The empirical studies that attempt to measure the development of entrepreneurship across countries or regions have introduced various definitions of the phenomenon as well. OECD defines entrepreneurship as a phenomenon related to entrepreneurial activity that is "the enterprising human action in pursuit of the generation of value, through the creation or expansion of economic activity, by identifying and exploiting new products, processes or markets" (Ahmad & Hoffman, 2008). This definition establishes the differentiation between entrepreneurial businesses and non-entrepreneurial that is closer to the Schumpeterian definition of entrepreneurship. As defined by Global Entrepreneurship Monitor, entrepreneurship is the act or process of starting a new business. The GEM emphasizes that the measurement of entrepreneurial activity should include not only those who have a functioning business but also those who are in the process of starting their own business. Gartner (1982) proposes the definition of

entrepreneurship that is understood as the process of creation of organizations. In this approach the entrepreneurship is seen as intricate process influenced by many factors where an individual has to undertake multiple tasks, e. g. find capital, organize the work process, find inventory, to create an organisation.

Even though there has been an abundance of different approaches to identifying the phenomenon of entrepreneurship in the economic literature, there has been a consensus on acknowledging the positive effect of entrepreneurial activity on national and regional economic development (Fritsch, 2013). J. Schumpeter in his "The Theory of Economic Development" (1911) was among the first scholars who linked the emergence of new dynamic entrepreneurs with the structural change in the economy and subsequent growth. Further empirical studies conducted since then reveal that entrepreneurial activity is positively related to the growth rate in regions (Acs and Armingnton, 2004), leads to overall productivity increase (M. Fritsch, 2013) and employment development (D. Birch, 1979). The "variety, competition, selection and also imitation" (Wennekers & Thurik, 1999) associated with entrepreneurial activity contribute to the development of the productive potential of national and regional economies which is achieved "by replacement or displacement of obsolete firms, by higher productivity and by the expansion of new niches and industries".

An empirical study conducted by Rico and Cabrer-Borrás (2019) also showed that entrepreneurship which is understood as the creation of firms "has a positive effect on productive efficiency and can explain the differences in the economic growth of the regions". Thus, entrepreneurship as a phenomenon that is understood in a variety of its definitions is one of the driving forces in economic development on both national and regional levels. Having established the working definition of the term entrepreneurship and discussed its relevance and importance for the economy, it is now important to specify the factors that determine the development of entrepreneurship.

The factors that have an impact on the rate of firm creation can range from specific psychological traits of people who decide to start a business, cultural and institutional frameworks, availability of resources, technological advances, industry-specific conditions, etc. In this paper, there is also a differentiation between endogenous and exogenous factors that affect entrepreneurial activity (Gnyawali & Fogel, 1994). Specifically, this paper will focus on exogenous factors that are derived from the environment and are caused by external agents, other people, or the socio-cultural norms and institutions where the entrepreneurial activity originates (Civera et al., 2020). Considering organizational theory's environmental determinism approach, these factors can also be described as "environmental variables" (Gartner, 1985), characteristics that are relatively fixed and are imposed on firms from outside. Thus, this paper will focus on macro-level or region-specific factors that can shape the level of entrepreneurship. It should be noted that these factors do not produce a higher number of firms per se. However, the environment in which these favorable conditions are present may generate a higher level of entrepreneurial activity (Holcombe, 2003).

Fritsch (2013) argues that it is crucial to investigate the region-specific characteristics as "new businesses emerge from the regional context and are shaped by regional conditions". Particularly, the availability of supportive infrastructure for starting a business, the number and size of actors, the quality of the workforce, and the location of a region can determine the difference in the number of new firms created and their quality across regions (Fritsch, 2013) The institutional framework has proven to be an important indicator to determine the differences in entrepreneurial activity (Hall & Sobel, 2008; Wennekers & Thurik, 1999; Baumol, 1990). Gnyawali and Fogel (1994) identify five dimensions of environmental conditions that were empirically studied or mentioned in the existing literature:

- government policies and procedures (presence of bankruptcy laws, entry barriers, requirements for registration and licensing, rules and regulations, counseling and support services);

- socioeconomic conditions (public attitude toward entrepreneurship, availability of experienced entrepreneurs as successful role models, existence of persons with entrepreneurial characteristics);
- entrepreneurial and business skills (business, technical and vocational training programs, business education, availability of information);
- financial support to businesses (availability of low-cost loans, venture capital);
- non-financial support to businesses (support services, networks of entrepreneurs, government spending on research and development, incubators, etc.).

In this paper, the focus of the study will be on government policies and procedures as well as non-financial support to businesses, particularly on regional governments' supportive services and spending on R&D.

There are also empirical studies that investigate different institutional conditions that can have an impact on the rate of firm creation that is a proxy of entrepreneurship development in regions or communities. Quantitative and qualitative methods are employed in these studies.

Jabłońska (2020) analyzed data on Polish and Czech municipalities' registered enterprises of the SME over 20 years. Through panel data analysis they concluded that there is an effect of the municipal revenue, average gross monthly salary, R&D expenditure on the rate of entrepreneurship in different regions. In the study, each of these factors is different across regions and municipalities and has a significant effect on the number of active enterprises registered in regions. The panel data analysis of Spanish regions suggests that formal institutions, particularly government policies and market openness, influence the level of entrepreneurial activity (Alvarez, Urbano, et al., 2011). Additionally, a presence of entrepreneurial support services, as well as actively engaged research universities, are conditions that reflect the successful establishment of an entrepreneurial culture (Feldman, 2001).

Civera et al. (2021) state that variations in firm birth rates are mainly explained by GDP per capita, unemployment, establishment size, and human capital. Also, an environment that is dominated by large companies is negatively related to the rate of business creation (Civera et al., 2021).

The topic of entrepreneurship has received considerable attention in the economic literature. However, there has been a lack of quantitative studies that can determine the effect of regional factors' influence on the formation of new enterprises. Thus, this paper aims at contributing to the existing research by analyzing the effect of exogenous factors such as governments' policy and institutions, its revenue, expenditure on R&D, capital investment, average gross salary, as well as the presence of large firms on the number of active SME. The analysis will be based on the data obtained on Ukrainian regions from 2012 to 2020. The objective of this paper is to provide some evidence for business community on possible challenges and opportunities that can arise from the exogeneous factors. Additionally, this study is aimed at finding the insights for the regional governments to better understand the dynamics of new firms' creation and design policies accordingly. However, there are certain limitations of the study that should be mentioned. The distinction between different types, sizes of firms and industries that operate are disregarded in this paper. Moreover, it doesn't investigate whether these factors influence the quality of business formed, there is no distinction between productive, unproductive, or destructive entrepreneurial activity (Baumol, 1990).

CHAPTER 3. METHODOLOGY

The methodology of this study is partly developed based on similar studies conducted in other countries (Jablonska, 2020; Rico & Cabrer-Borrás, 2019; Civera et al., 2020; Alvarez, Urbano, et al., 2011). Jablonska (2020), Rico & Cabrer-Borrás (2019) use panel data analysis to examine the relationships while Civera et al.(2020) employed a logit model to estimate the probabilities of events and determine their relative influence or weight (Civera et al, 2020).

In this paper, the panel data regression is used to analyze the effect of the determining factors on the development of entrepreneurship in 24 regions of Ukraine over 8 years (2012-2020). The choice of regression using panel data is based on certain advantages of this analysis that are related to the main objectives of this study. First, due to the presence (usually) of a greater number of degrees of freedom and sample variability, the econometric parameters of panel data analysis are more efficient compared to simple cross-section data (Hsiao, 2006). The longitudinal data allows to generate more accurate predictions for individual outcomes, uncover dynamic relationships between variables and analyze change over time (Hsiao, 2006; Prior, 2018; Andreß, 2017).

Secondly, the panel data analysis helps to obtain consistent estimators in the case of the omitted variable problem (Wooldridge, 1999). It may mitigate omitted variable bias when there is no information on variables that correlate with both the regressors of interest and the independent variable (Hsiao, 2006). This study is especially susceptible to the problem of omitted variables as there is a great extent of factors that cannot be measured and included as explanatory variables. Thus, using panel data analysis should be used to study the effect of factors.

Since entrepreneurship in this study is defined as "the creation of organizations" (Gartner, 1988; Civera et al., 2020), the yearly number of active firms in each region will be used as the dependent variable. Wennekers and Thurik (1999) for practical purposes

suggest that "the number of real entrepreneurs would approach the level of entrepreneurial activity more closely". Additionally, the models with dependent variables on the number of enterprises and individual entrepreneurs will be analyzed to see whether there is a difference in the effects of explanatory variables.

A literature review of similar empirical studies and theoretical frameworks was done to identify the factors that can potentially have an effect on entrepreneurship development in Ukrainian regions. Explanatory variables that are used in the model are policy, institutions, average monthly salary, the total yearly revenue of regions, the number of large companies (with more than 250 workers), region's total expenses on research and development and expenditures on capital investment. It is important to note that the list of chosen explanatory variables in this paper is not complete and is open to modification. The analysis was based on factors that are of financial nature and potentially can foster or suppress entrepreneurial activity in regions. The availability of data as well as time horizon also played an important role in the process of selection of factors.

The variable *Policy* contains information on regional governments' policies and programs that are aimed at promoting and supporting entrepreneurial activity. This factor is highlighted in relevant academic papers. Holcombe (2003) states that "government policies can have a major effect on the amount of entrepreneurship that takes place" and provide stable economic conditions as well as protect property rights that will foster new business creation. Gnyawali and Fogel (1994) also conclude that business assistance (e.g. training programs, consulting services, tax exemptions, or subsidies) has shown to be an important factor in helping develop entrepreneurship in regions.

GEM in its National Expert Survey (NES) outlines two dimensions of the government's role in the support of entrepreneurs. The first one is government policy which asks whether decisions promote business creation and whether new firms are burdened by tax and regulation. The second dimension of the GEM survey is related to the availability of quality government entrepreneurial programs. Thus, the variable *Policy*

is determined in terms of the presence of the two dimensions in regional governments' decision-making and presented as a dummy variable where 1 indicates that the regional government implements policies and programs that support entrepreneurial activity, 0 if not.

The variable describing regions' total yearly revenue is taken from a similar study conducted in Polish and Czech municipalities (Jablonska, 2020). The results of the analysis show different effects of the variable on the rate of business creation in the two countries. Jablonska (2020) found that municipalities' total yearly revenue has a positive effect on the rate of entrepreneurial activity in Polish communities while in Czech regions the effect was negative. Thus, due to the presence of conflicting views on the relevance of regions' regional product per capita to entrepreneurship development, this variable will be included in this paper.

The region's average gross salary is another variable that is statistically significant but may have a different effect on the dependent variable. Jablonska (2020) found that in communities in the Czech Republic the salary's impact on the rate of new business formation is positive while in Polish municipalities the effect is the opposite. The authors conclude that "running one's own business at a certain level of remuneration in the economy is not attractive, therefore, the level of remuneration for these regions (saturated with a large number of micro-enterprises) had a negative impact on the creation of new companies" (Jablonska, 2020). Grilo and Thurik (2004) also emphasize the importance of the wage level relative to self-employment income in shaping entrepreneurial activity.

The number of large firms in the region is also included in the model as it can also affect the number of firms that are created in regions. Civera et al. (2021) found that "a high percentage of large companies decreases the likelihood of business creation". This effect is explained by the fact that large firms are more likely to create stable job opportunities for people in communities which makes the prospect of creating small and

medium businesses less appealing. Additionally, in terms of getting an adequate level of remuneration from entrepreneurial activity, employment in large firms can be more advantageous.

Lastly, the variable describing the share of the region's expenditure on research and development (R&D) in total is also included in the econometric model. Civera et al. (2021) use the variable as the proxy for business training. As argued by Gnyawali & Fogel (1994) that higher levels of investment in human capital by local governments are positively related to the rate of entrepreneurial activity. Audretsch and Link (2019) conclude that R&D investments by the public sector provide "knowledge spillovers" that prove to increase the probability and performance of new companies. Capital investment expenditures were also included in the model to analyze the effect (if any is present) of the private sector's expenditures on business development.

Thus, the basic unobserved effects model is written:

$$\boldsymbol{Total\_SME_{it} = \beta_0 + \beta_6 Large\_Firms_{it} + \beta_1 Policy_{it} + \beta_2 Institution_{it} + \beta_3 log(Revenue_{it}) + \beta_4 log(R\&D_{it}) + \beta_5 log(Salary_{it}) + \beta_7 log(CapInv_{it}) + \beta_8 log(GRP_{it}) + \beta_9 log(Population_{it}) + v_{it}}$$

i =1, 2, …24, t = 1, 2, …8

Where:

$v_{it} = a_i + u_{it}$

- a_i is an unobserved effect or unobserved heterogeneity.
- u_{it} is an idiosyncratic error.

The following independent variables are used in the model:

- *Policy* is a dummy variable where 1 indicates that a regional government implements policies and programs that support entrepreneurial activity, 0 if not.
- *Institution* is a dummy variable where 1 indicates that the regional government has functioning institutions that are responsible for support of the development of entrepreneurship activity, 0 if not.
- *Salary is* the average gross monthly salary in UAH.
- *CapInv* is the total expenditures on capital investment in UAH.
- *Revenue* is the total yearly income of regions in UAH.
- *R&D* is the region's total expenses on research and development in UAH.
- *GRP* is the total yearly gross regional product in UAH.
- *Large_Firms* is the number of large companies (with more than 250 workers).
- *Population* is the total number of people living in a region.

The dependent variables are:

- *Total_SME* is the number of active enterprises and individual entrepreneurs in each region.
- *IndvEntr is* the number of active individual entrepreneurs that are registered in each region.
- *Enterprises is* the number of active enterprises that are registered as legal entities in each region.

The linear-log model will be estimated as the goal of this study is to find how the change in identified factors can influence the dependent variables, the total number of SMEs as well as the number of individual entrepreneurs and enterprises. Instead of specifying whether the model is the random or fixed effect model is used as further statistical tests are needed to be performed to determine the best fitting model (Wooldridge, 1999). Thus, three types of regression for panel data will be analyzed:

- Pooled OLS

- Random Effects
- Fixed Effects

The pooled OLS is also estimated as the assumption of the presence of the unobserved effect may not hold. The best-fitted model will be determined by the set of tests that will be performed after the data collection. The Breusch-Pagan Lagrange multiplier (LM) test will be performed to determine between pooled OLS or random effects. Lastly, to specify the effect of the model the Hausman test is needed where the null hypothesis is that the covariance between independent variables and alpha is zero. If this holds, then the random effects is preferred over the fixed effects model. The presence of heteroskedasticity will be checked by the Breusch-Pagan test. The Breusch-Godfrey/Wooldridge test will be also performed to check for serial correlation in the panel model. The presence of heteroskedasticity, as well as serial correlation, can make regression results unreliable. Thus, depending on whether both heteroskedasticity and autocorrelation are present or only one phenomenon is observed the standard errors should be adjusted to have more grounded regression results.

CHAPTER 4. DATA

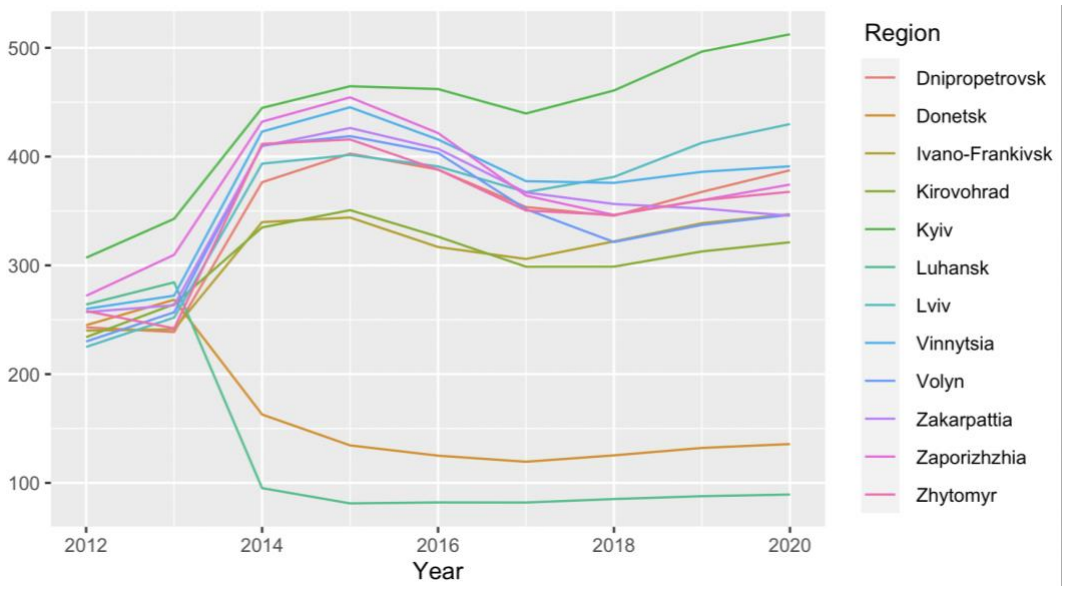
The data on 24 regions over the 10-year period was mainly collected from the State Statistical Service, the regional governments' open resources, the Ministry of Regional Development, the Ministry of Finance, National Bank of Ukraine. It should be noted that some data was collected manually from available publications while other data was available in a well-organized manner.

The dependent variable, entrepreneurial activity was collected in different ways. It is important to mention that this paper aims to explore entrepreneurial activity, particularly the development of small and medium businesses. In Ukraine, entrepreneurship is defined as "a direct, independent, systematic, at one's own risk, of making products, the performance of work, provision of services for profit, which is carried out by individuals and legal entities registered as subjects of entrepreneurial activity following the procedure established by law". Thus, enterprises of different forms and individuals that are registered as entrepreneurs are considered as main subjects of entrepreneurial activity in this paper. It is also important to mention that enterprises in Ukraine are classified according to the type of activity, form of ownership, and size. In this study, the latter categorization is applied as it is important to distinguish between large and small & medium businesses for the analysis. There are 4 types of enterprises according to the law "On accounting and financial reporting in Ukraine":

- Microenterprises have an average number of employees of up to 10 people. Annual income does not exceed 700 000 euros while the value of assets does not exceed 350 000 euros.
- Small enterprises have net income per year that does not exceed 8 million euros yet not less than 700 000. The total value of assets is from 350 000 to 4 million euros and the number of employees can be from 10 to 50 people.

- Medium enterprises are the ones that don't fall into the categories of small and large enterprises. Usually, such organisations employ from 50 to 250 people and have a net income between 8 and 40 million euros.
- Large enterprises are defined as ones that have more than 250 employees where the value of assets exceeds 20 million euros, and the net annual profit cannot be less than 40 million euros. Calculations are performed in national currency at the current exchange rate of the National Bank at the time of the analysis.

Figure 2. The number of individual entrepreneurs per 10 000 people in 12 regions from 2012 to 2020



Source: SSSU

The data on the number of small, micro and medium enterprises in all 24 regions from 2012 to 2020 was collected from the State Statistical Service. Then the total number of firms of small, micro and medium sizes by region for each year was calculated. This data on enterprises for all regions is available from 2012 to 2020. For the individual entrepreneurs, the data was also obtained from the database of the State Statistical Service

of Ukraine which is available from 2013 to 2020. The data on the number of individual entrepreneurs from 2012 to 2013 was obtained from the statistical publication "Activity of Business Entities" (2013). It is important to take a closer look at and explore how the number of SMEs changed through the period analyzed and in each region. Table 1 shows the descriptive statistics of the variable numbers of small and medium businesses per 10 000 people in each region from 2012 to 2020. The regions with the highest average number of SMEs per 10 000 people are Kharkiv, Kyiv, Odesa, Mykolaiv, Dnipropetrovsk, Zaporizhzhia, Khmelnytskyi, and surprisingly Chernivtsi. The data on Donetsk and Luhansk oblasts excludes the temporarily occupied territories. These regions had severely suffered from the war with russia that began in 2014 as their population decreased and overall social and economic situation deteriorated. In these regions, the standard deviations (SD) of the number of SMEs are also higher than the average SD in other regions. The war also has had an impact on other regions as there was influx of internally displaced peoples (IDPs) from Donetsk, Luhansk and Crimea regions since 2014 as well as some business relocated their operations to more safe regions. Also, the data on the Autonomous Republic of Crimea which has been occupied since 2014 is not included in this analysis.

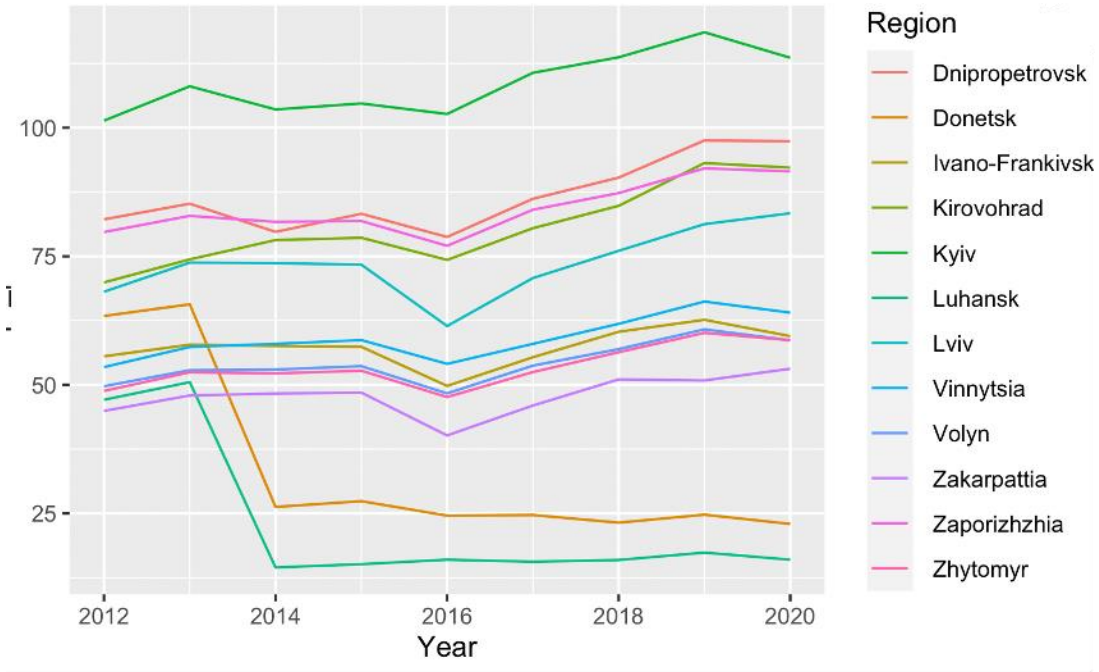
Table 1. Descriptive statistics of the variable on small and medium businesses (*Total_SME*) per 10 000 people in each region from 2012 to 2020.

Region	**Min**	**Max**	**Median**	**Mean**	**SD**
Cherkasy	333	476	431	424	48
Chernihiv	309	426	390	385	38
Chernivtsi	356	525	481	468	58
Dnipropetrovsk	324	486	456	432	63
Donetsk	144	334	159	195	73
Ivano-Frankivsk	296	406	382	368	43
Kharkiv	413	630	585	562	81
Kherson	340	481	443	429	45
Khmelnytskyi	350	511	482	459	61
Kirovohrad	304	429	401	385	40
Kyiv	408	626	565	545	72
Luhansk	96	335	105	151	98

Region	Min	Max	Median	Mean	SD
Lviv	293	513	457	435	75
Mykolaiv	399	501	483	475	33
Odessa	428	585	550	532	50
Poltava	341	482	435	427	47
Rivne	269	381	344	339	37
Sumy	254	409	375	362	51
Ternopil	264	419	363	355	50
Vinnytsia	313	504	452	431	66
Volyn	280	472	405	396	66
Zakarpattia	302	475	407	402	60
Zaporizhzhia	352	536	452	455	58
Zhytomyr	295	469	420	402	62

Source: SSSU

Figure 3. The number of small and medium enterprises per 10 000 people in 12 regions from 2012 to 2020



Source: SSSU

As one of the goals of this paper is to see whether there is a difference in the effects of explanatory variables on different types of small and medium businesses, the data on the number of enterprises and individual entrepreneurs were obtained as well. As observed in Figures 3 and 4 where only data for 12 regions is depicted (the data on the other 12 regions is in Appendix B), certain similar as well as differing trends are present. The number of individual entrepreneurs was increasing since 2012 as the whole economy of recovering from the 2008 crisis and reached its peak in 2014. The number of enterprises was also slightly increasing or remained almost on the same level from 2012 up to 2015 (2013 was also a year of fluctuations for some regions) then from 2015 to 2016 fell in numbers and again increased from 2016 up until 2019 (in 2020 the impact of COVID-19 can be observed).

Policy is a dummy variable where 1 indicates that a regional government implements policies and programs that support entrepreneurial activity, 0 if not. The information on regions' policies that address the development of small and medium entrepreneurs was collected using official databases of regional governments' decisions of the 6th (2010-2015) and 7th (2015-2020) convocations as well as of the 5th convocation (2005-2010). On the national government level, the law "On the development and state support of small and medium-sized enterprises in Ukraine" was adopted in 2012. This law mentions that regional and local governments are responsible for "developing projects of regional and local programs for the development of small and medium-sized enterprises, ensuring their implementation taking into account national priorities, national and regional, socio-economic, ecological, cultural and other features, monitoring the implementation of such programs".

The regional councils or state administrations' websites were used to find the programs for each year. Mostly regional governments had programs adopted for 2 years, while there were few regions where programs covered up to 5 years. Thus, each year that was mentioned in the program meant that certain actions aimed at supporting the

development of entrepreneurship were implemented on the part of the regional government.

Institutions is another variable that addresses the regional governments' role in supporting the development of entrepreneurship. The availability of separate institutions that provide support to businesses is also a part of the national strategy for SME development. The creation of these organizations is a part of regional governments' responsibilities.

The data on the variable *Salary* was obtained from the State Statistical Service of Ukraine. This variable is collected by the Ministry of Finance of Ukraine for each region and represents the average gross monthly wages of regular employees by region in UAH. In Table 2 the basic descriptive statistics of the variable are presented. The highest average monthly salaries are in Donetsk, Dnipropetrovsk, Kyiv, Mykolaiv, and Zaporizhzhia regions. The lowest wages can be found in Volyn, Chernihiv, Kherson, Chernivtsi, and Ternopil regions.

Table 2. Descriptive statistics of the variable Salary for each region from 2012 to 2020

Region	Min	Max	Median	Mean	SD
Cherkasy	1835	9797	3360	4697	2860
Chernihiv	1711	9328	3295	4423	2691
Chernivtsi	1772	9166	3050	4352	2655
Dnipropetrovsk	2369	11681	4366	5722	3331
Donetsk	2549	12647	4980	6318	3604
Ivano-Frankivsk	1927	9980	3402	4751	2876
Kharkiv	2060	9968	3697	4948	2826
Kherson	1733	9354	3123	4424	2725
Khmelnytskyi	1786	9872	3371	4641	2852
Kirovohrad	1815	9603	3282	4542	2744
Kyiv	2295	11887	4153	5783	3461
Luhansk	2271	10182	3427	5002	2670
Lviv	1941	10299	3646	4971	3019
Mykolaiv	2122	11414	3984	5360	3230
Odessa	2046	10336	3897	5095	2961
Poltava	2102	10819	3783	5236	3145

Region	Min	Max	Median	Mean	SD
Rivne	1960	10254	3573	4842	2899
Sumy	1866	9785	3449	4667	2789
Ternopil	1659	9384	2994	4316	2769
Vinnytsia	1782	10297	3396	4805	3070
Volyn	1692	9256	3291	4523	2777
Zakarpattia	1846	10193	3381	4824	3087
Zaporizhzhia	2187	11556	4200	5564	3337
Zhytomyr	1785	9571	3271	4557	2798

Source: Ministry of Finance of Ukraine

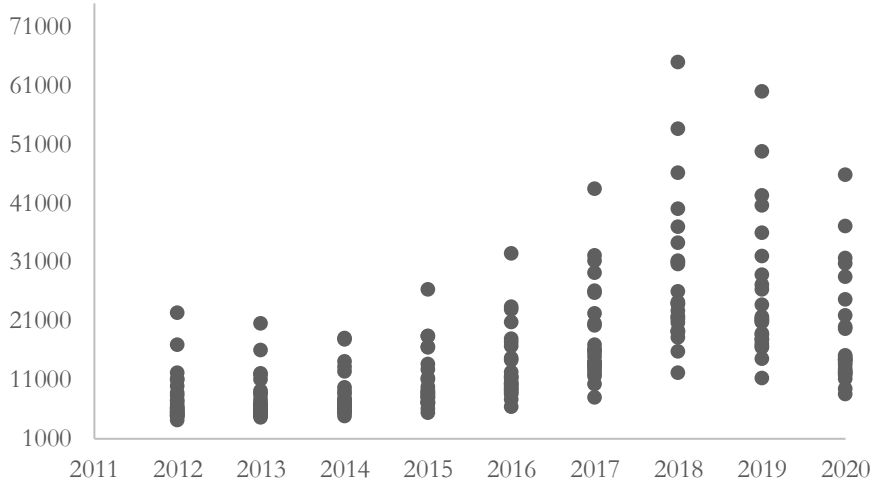
Variable Revenue is the total yearly income of regions in UAH. The source of this data is the Ministry of Finance Statistical Publication "Budget of Ukraine". This variable includes taxes on revenue, income, market value increase, rent and fees for other natural resources use, domestic taxes on goods and services, and local taxes and fees. Local budgets also include non-tax revenues (property and entrepreneurial activity income, fee for administrative services, receipts from equity investments in localities infrastructure development, own-source revenues of budgetary institutions), special funds, revenues from capital transactions, official transfers from the European Union, foreign governments, international organizations, donor agencies.

It is important to mention that regions' structure and amount of revenue drastically changed over the 10-year period that is analyzed in this study. The most important change happened when the government launched a decentralization reform in 2014 that aimed at providing local bodies more responsibilities over their communities and improving their operational efficiency to provide better services to citizens.

Prior to the reform, there was a significant regional disparity as, for example, in 2014 only 6 regions in Ukraine were self-sufficient while the rest of the regions were heavily dependent on transfers from the national government. The communities were given a chance to voluntarily consolidate and form amalgamated territorial communities to get the powers and resources previously vested in cities of regional importance.

The financial decentralization started in 2015 provided local governments with a larger source of revenue that was supposed to increase their economic capacities. Thus, the ATC budgets now receive 60% of the personal income as well as a single tax, property tax (real estate, land, vehicles), corporate and communal financial institution income tax. In Figure 1, the scatter plot of regions' total revenue from 2012 to 2020 shows how substantially regions' income changed from 2015.

Figure 4. Regions' total yearly revenue in millions UAH, 2012-2020



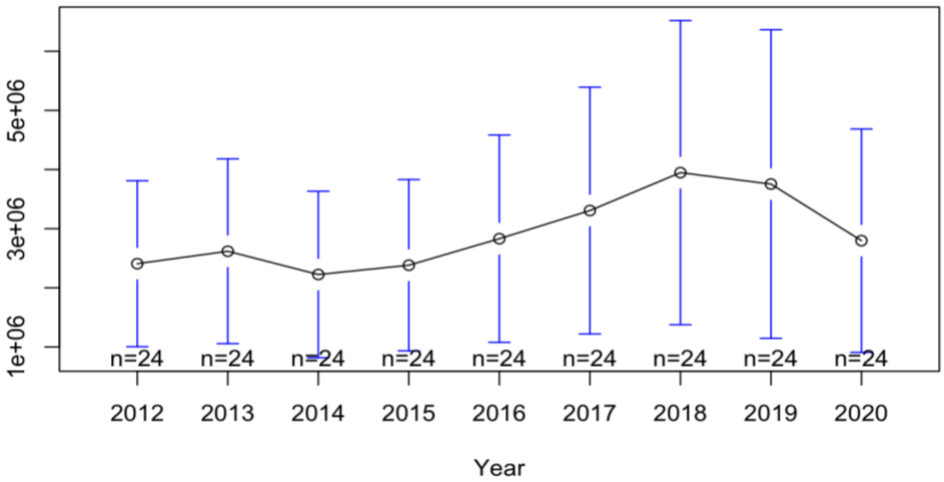
Source: Ministry of Finance's Statistical Publication "Budget of Ukraine"

Data on capital investment for each region was also included in the model as a variable that captures businesses' long-term growth strategies and development plans. Higher levels of capital investment indicate that businesses are dedicated to increasing productivity, gaining a competitive advantage in the market, and ensuring the efficiency of their operations. In the analyzed literature the variable on capital investment is not included in the models. This variable will be included in this analysis as an attempt to identify additional factors that can have an impact on the number of active SMEs in regions. As stated in SSSU, capital investment is "costs for the acquisition or production (creation) of tangible and intangible non-current assets". Investments in residential and

non-residential buildings, engineering structures, machines, equipment and inventory, vehicles, land, and long-term biological assets of livestock and crop production are considered investments in tangible assets. Investments in intangible assets include investments in the acquisition or self-creation of rights to use natural resources and property, software and databases, rights to commercial designations, industrial property objects, copyright and related rights, patents, licenses, concessions, etc. The data on capital investments are counted by enterprise-legal entities according to their main type of economic activity and legal address.

Variable R&D is the region's total expenses on research and development per capita in UAH. This data was collected from the Statistical collection "Scientific and innovative activity in Ukraine" in the part of "Financing costs for carrying out research and development by region". In Figure 6, the heterogeneity across years of regions' expenses on research and development (R&D) from 2012 to 2020 is presented where dots represent means and a 95% confidence interval around the means is drawn. The mean expenses on research and development per 10 000 people in regions fell in 2014 and then began to increase up to 2018.

Figure 5. Heterogeneity across years of regions' expenses on research and development (R&D) from 2012 to 2020. Bars indicate 95% confidence intervals

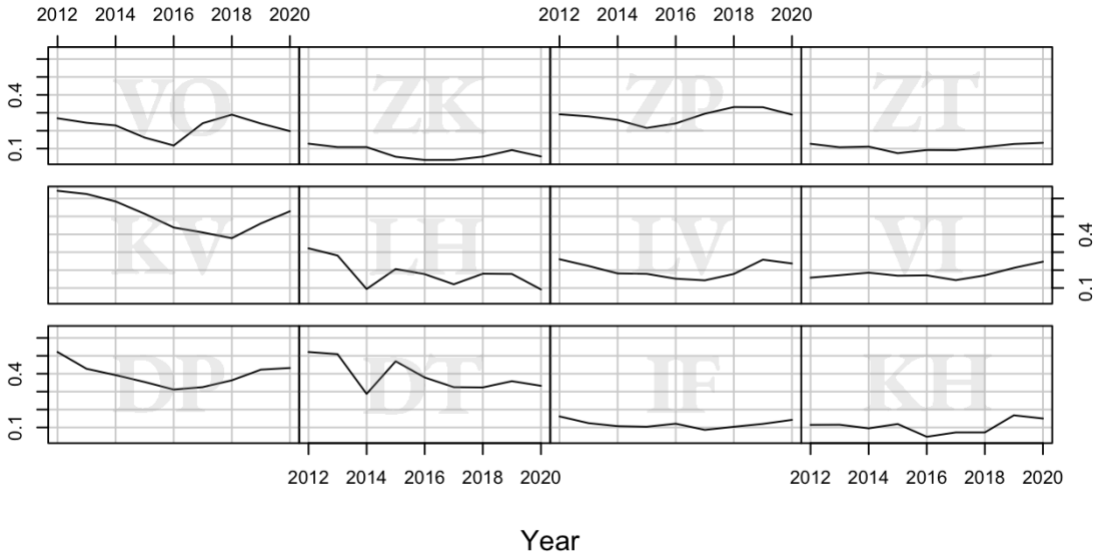


Source: SSSU

Gross regional product (GRP) is the general indicator that characterizes the level of development of the region's economy and is defined as the sum of the gross value added of all types of economic activity, including net taxes on products. The GRP is presented in the total yearly amount and Ukrainian currency.

Large_Firms is the number of active large enterprises with more than 250 workers in regions. Figure 3 shows how the number of large enterprises that was adjusted for the size of the population changed over 10 years in each region. In some regions, the number of large firms stayed constant and didn't change drastically while in others fluctuations in the number are observed. In some regions, similar trends that are detected in the total number of SMEs can be seen (e.g., Donetsk, Luhansk, Zaporizhzhia, Volyn oblasts). In the period from 2013 to 2015, there are the most noticeable decline in the number of big enterprises which was also the case for small businesses. However, the period leading to 2013 was less turbulent for large firms than it was for SMEs.

Figure 6. Number of large firms per 10 000 people in 12 regions from 2012 to 2020



Source: SSSU

There are certain limitations and gaps in data that should be addressed. The dependent variable which is a sum of the number of enterprises and individual entrepreneurs may misrepresent the real situation with entrepreneurial activity in Ukrainian regions. Firstly, individual entrepreneurs may not always conduct entrepreneurial activity and can be employed as usual full-time personnel by enterprises. Due to the simplified system of taxation that is available for certain groups of individual entrepreneurs and as the one way to avoid paying taxes for personnel, firms may opt to contract individual entrepreneurs as full-time workers (Yavorskyi, 2020). By not officially registering them as employees, firms do not pay a single social contribution tax whereas employees pay fewer taxes. Companies may abuse the system of simplified taxation and create situations where individual entrepreneurs act as usual employees and do not engage in entrepreneurial activity.

Secondly, Yavorskyi (2020) also mentions another scheme that is used for tax avoidance when a business uses "employees registered as individual entrepreneurs as a way to increase the turnover of the company and avoid the general taxation system". In this case, individual entrepreneurs who work at the business acts as a seller of services to customers that allows them to avoid paying VAT and income tax. Thus, such practices may exaggerate substantially the number of individual entrepreneurs. It can also be the case where in some regions these tax avoidance practices can be more prevalent than in other regions hence creating a very distorted picture of entrepreneurial activity. However, there is no possible way to estimate how many individual entrepreneurs are actually a part of such schemes as well as to find data that accounts for such phenomena. Another problem with the data is informal entrepreneurship and individual economic activity without registration. The Ministry of Economy of Ukraine estimated that in 2020 the shadow economy amounted to 32% of the country's GDP. Thus, the interpretation of the results of this study should acknowledge these inconsistencies in the data.

Another variable that also should be addressed in this section is Salary. The data on average gross monthly is calculated by summing up all salaries in a company and dividing

it by the number of employees. Generally, the data can be skewed, for example, if companies pay very high salaries to management or senior staff and have other employees being severely underpaid. This kind of situation skews the average salary to higher numbers. However, the main problem with the data is very similar to the one with the number of individual enterprises. Again, to avoid paying taxes, enterprises may use the scheme called "salary in envelopes" where part of an employee's remuneration is paid officially (usually, it is equal to minimum wage) and another part is paid in cash. According to the survey conducted by Razumkov Centre in 2019, 62% of Ukrainians work officially and receive only an official salary, 16.6% of those officially employed receive additional wages in "envelopes" while 20% of respondents work without official registration on the basis of a verbal agreement. Thus, the salary of more than a third of the population is only partially represented in the statistical data.

CHAPTER 5. RESULTS

5.1. Model specification. Pooled OLS, Random and Fixed effects

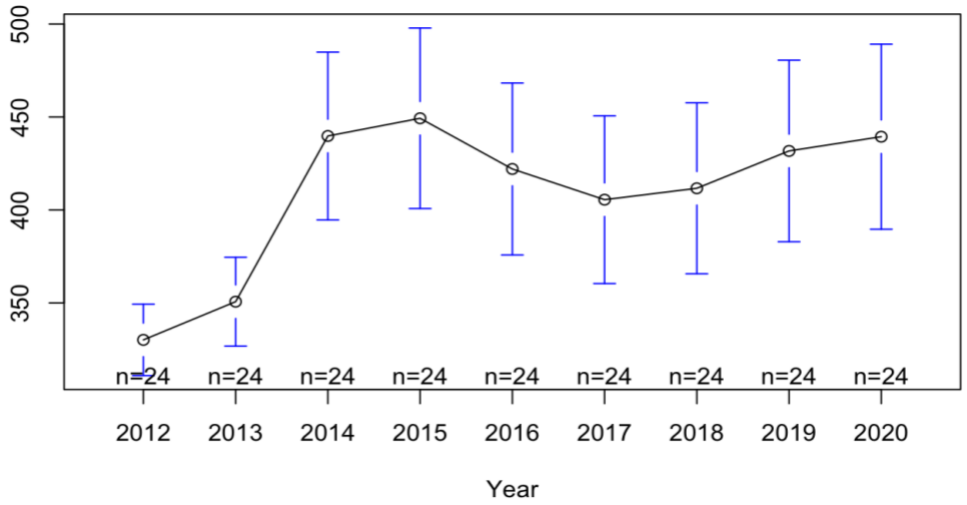
The panel data analysis was chosen in this study as it enables the analysis to control for individual heterogeneity, meaning to oversee the factors that cannot be observed or measured. Before proceeding to the discussion of the results, it is important to correctly identify which model should be used in this analysis. Thus, 3 models, pooled OLS, fixed and random effects were performed for different dependent variables, the total numbers of SMEs, individual entrepreneurs and enterprises, and then the results of additional diagnostic tests were compared.

As the aim is to analyze what factors influence the dependent variables, the total number of SMEs as well as the number of individual entrepreneurs and enterprises in Ukrainian regions are presented in actual numbers and are not log-transformed. The explanatory variables were collected in actual numbers and were transformed into logarithmic forms in the model to deal with the skewness of the original data. In Figures 4 and 5, the heterogeneity across years for variables of the total number of SMEs and enterprises per 10 000 people respectively are presented. Again, the dots identify means and bars indicate 95% confidence intervals around the means. Visual inspection of the graphs suggests the presence of heterogeneity in the data where means are heterogeneous across years.

Having specified the md, pooled OLS, the fixed and random effects models with *Total_SME* as the dependent variable were tested and the results are presented in Table 3. The decision on the best-fit model in this case is based on the results of additional tests. The Hausman test is performed to decide between random and fixed effects estimators. The null hypothesis of the test states that individual errors are correlated with the regressors which means that the random effects are present. The test yields a p-value

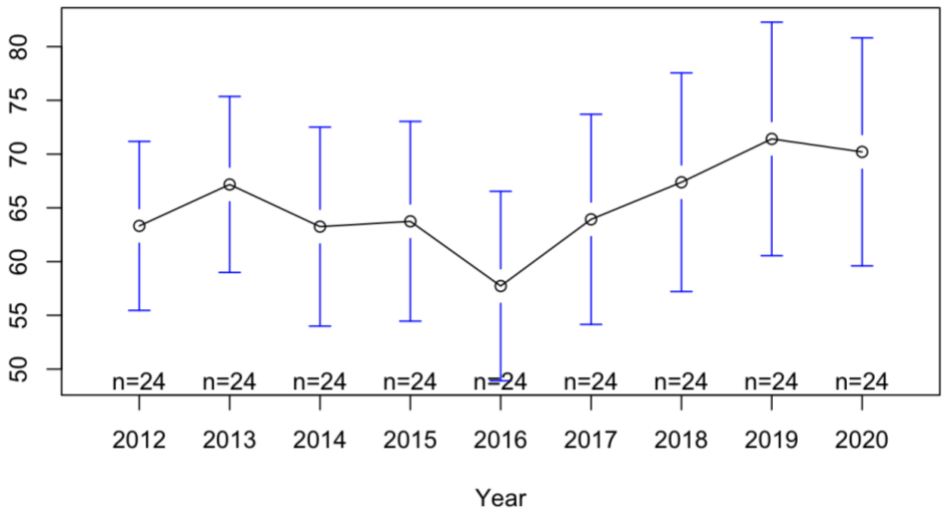
of 0.9126 which is large enough to reject the null hypothesis. Thus, the results indicate that the random effects are observable.

Figure 7. Heterogeneity across years of the number of SMEs per 10 000 people from 2012 to 2020. Bars indicate 95% confidence intervals



Source: SSSU

Figure 8. Heterogeneity across years of enterprises per 10 000 people from 2012 to 2020. Bars indicate 95% confidence intervals



Source: SSSU

Second, having identified that random effect is preferred to fixed effect, it is now important to test whether pooled OLS or random effect is a better fit in this case. The Breusch-Pagan Lagrange multiplier (LM) test is used to compare the models where the null hypothesis is that the variance across entities is zero indicating that pooled a simple OLS regression is preferred. The low p-value for the test shows that the hypothesis can be rejected. Thus, the random effect estimators are preferred in the model with the dependent variable *Total_SME*.

Pooled OLS, random and fixed effects models were tested for the variables *Enterprises* and *IndvEntr* as dependent variables. The Hausman test for the model with dependent variable *IndvEntr* indicates that the random effects estimators should be used. However, for the model with the number of enterprises as the dependent variable, the Hausman test shows that the fixed effects model is preferable. The Breusch-Pagan Lagrange multiplier (LM) test for both models shows that pooled OLS is not applicable. The results of fixed and random effects models are presented in Table 4 where the preferred models for each variable are in bold.

As the Hausman test showed that for the model with the variable Enterprises as dependent, the fixed effect estimators are the most suitable, the test for time-fixed effects, Lagrange Multiplier Test, was also performed. The null hypothesis is that there are no time-fixed effects observed. The test produced a p-value small enough to reject the null hypothesis indicating that the time-fixed effects should be used. Thus, in Table 4 the parameter estimates of the model that include time-fixed effects are also included in bold.

Additional tests for heteroskedasticity and serial correlation of residuals should be performed to have more reliable estimators to proceed to the discussion of the results of the analysis. The models were tested for heteroskedasticity with the Breusch-Pagan test where the null hypothesis is homoskedasticity is present in the model. The results for all three models produce a p-value small enough to reject the null hypothesis. Thus, detected heteroskedasticity indicates that the results of the models might be not reliable.

The Breusch-Godfrey/Wooldridge test for serial correlation in panel models was performed on all three models that showed evidence of serial autocorrelation which as well as the presence of heteroskedasticity makes estimated results unreliable. Additionally, the presence of autocorrelation makes invalid the usual standard errors as well as heteroskedasticity-consistent ones. Thus, in the case when both heteroskedasticity and serial correlation are present heteroskedasticity and autocorrelation-consistent (HAC) standard errors need to be used.

In Table 5, the coefficients that were estimated with heteroskedasticity and autocorrelation-consistent (HAC) standard errors are presented. The coefficients' standard errors changed while the effects remained unaltered which caused some variables to become less or more significant. Overall, mainly all the parameter estimates of independent variables remained significant even using HAC consistent standard errors. For the model with the variable Enterprises as dependent, the HAC consistent standard errors were applied and the statistical significance of some variables changed. The standard errors of the variable Revenue changed substantially that lead to the loss of statistical significance. Results of all the regression are presented in Tables 3, 4, and 5 and can be compared to each other.

Table 3. Results of the Pooled OLS, Random and Fixed Effects regression models with *Total_SME* as dependent variable (preferred model is in bold)

	Dependent variable:		
	Total_SME		
	Fixed effects	**Random effects**	Pooled OLS
	(1)	**(2)**	(3)
Large_firms	180.1*	**7.2**	-203.1*
	(107.5)	**(103.5)**	(110.6)
log(Salary)	-39,831.0***	**-38,298.1*** **	-43,127.1***
	(4,950.0)	**(4,408.2)**	(4,411.8)
Policy	-1,608.4	**-459.7**	3,737.9
	(2,021.5)	**(2,278.7)**	(2,796.2)
Institution	-729.4	**-1,230.9**	-2,433.0
	(2,155.2)	**(2,358.7)**	(2,700.4)
log(CapInv)	-12,636.5***	**-11,513.8*** **	-4,810.1
	(3,426.2)	**(3,760.5)**	(4,372.4)
log(GRP)	65,542.5***	**51,569.2*** **	30,219.7***
	(6,220.5)	**(5,947.1)**	(6,121.6)
log(RD)	2,337.0	**6,163.5*** **	8,093.6***
	(1,841.3)	**(1,280.7)**	(992.6)
log(Revenue)	1,061.9	**8,352.0* **	26,756.9***
	(4,062.3)	**(4,318.2)**	(5,147.0)
log(Population)	56,918.7	**3,622.5**	9,982.9**
	(56,646.9)	**(5,708.2)**	(4,571.8)
Constant		**-986,419.1*** **	-1,121,702.0***
		(72,056.6)	(62,226.6)
Observations	214	**214**	214
R^2	0.6	**0.7**	0.8
Adjusted R^2	0.5	**0.7**	0.8
F Statistic	27.4*** (df = 9; 181)	**561.1*** **	127.0*** (df = 9; 204)
Note:			*p**p***p<0.01

Table 4. Results of the Random and Fixed Effects regression models for *IndvEntr* and *Enterprises* as dependent variables (preferred model is in bold)

	Dependent variable:				
	IndvEntr		**Enterprises**		
	Fixed effects	**Random effects**	Fixed effects	Random effects	**Time fixed effects**
Large_firms	-12.838	**-122.476**	192.897***	162.897***	**174.773*** **
	(101.829)	**(95.716)**	(11.861)	(12.929)	**(12.237)**
log(Salary)	-38,780.540***	**-34,834.740*** **	-1,050.502*	-1,901.397***	**-8,764.267*** **
	(4,689.195)	**(4,041.256)**	(546.179)	(563.076)	**(2,431.653)**
Policy	-1,697.449	**-715.549**	89.007	234.070	**40.829**
	(1,914.997)	**(2,141.097)**	(223.051)	(257.853)	**(212.779)**
Institution	-1,106.112	**-1,240.842**	376.723	310.316	**338.618**
	(2,041.673)	**(2,203.366)**	(237.806)	(272.577)	**(213.697)**
log(GRP)	63,314.100***	**45,451.950*** **	2,228.381***	2,968.737***	**1,607.943**
	(5,892.747)	**(5,463.402)**	(686.364)	(756.024)	**(1,034.599)**
log(RD)	2,210.734	**4,886.431*** **	126.296	775.593***	**87.870**
	(1,744.325)	**(1,136.629)**	(203.172)	(198.291)	**(192.994)**
log(CapInv)	-12,391.500***	**-11,422.200*** **	-244.977	-148.112	**337.979**
	(3,245.706)	**(3,517.283)**	(378.047)	(432.404)	**(389.671)**
log(Revenue)	626.206	**9,503.530** **	435.656	188.314	**2,537.331** **
	(3,848.267)	**(4,042.293)**	(448.231)	(500.239)	**(1,121.938)**
log(Population)	46,052.280	**2,941.986**	10,866.400*	3,277.425***	**13,721.590** **
	(53,662.560)	**(5,042.733)**	(6,250.404)	(1,081.448)	**(5,862.678)**
Constant		**-868,372.400*** **		-111,257.500***	
		(63,910.790)		(14,206.240)	
Observations	214	**214**	214	214	**214**
R^2	0.543	**0.705**	0.787	0.785	**0.816**
Adjusted R^2	0.462	**0.692**	0.750	0.775	**0.773**
F Statistic	23.884*** (df = 9; 181)	**486.019*** **	74.505*** (df = 9; 181)	743.178***	**85.201*** ** **(df = 9; 173)**

Note: *p**p***p<0.01

Table 5. Regression results for all three models with Heteroskedasticity and Serial Correlation (HAC) Consistent Coefficients

	Dependent variable:		
	Total_SME	IndvEntr	Enterprises
	Random effects	Random effects	Time Fixed effects
	(1)	(2)	(3)
Large_firms	7.2	-122.5	174.8***
	(242.0)	(228.6)	(38.2)
log(Salary)	-38,298.1***	-34,834.7***	-8,764.3***
	(6,398.7)	(6,130.6)	(3,009.9)
Policy	-459.7	-715.5	40.8
	(1,770.1)	(1,724.1)	(179.7)
Institution	-1,230.9	-1,240.8	338.6
	(2,275.5)	(2,058.6)	(236.4)
log(GRP)	51,569.2***	45,452.0***	1,607.9
	(10,022.6)	(9,821.7)	(1,284.7)
log(RD)	6,163.5***	4,886.4**	87.9
	(2,332.1)	(2,140.3)	(391.0)
log(CapInv)	-11,513.8**	-11,422.2***	338.0
	(4,566.2)	(4,200.1)	(443.2)
log(Revenue)	8,352.0***	9,503.5***	2,537.3
	(2,562.3)	(2,685.3)	(1,673.7)
log(Population)	3,622.5	2,942.0	13,721.6*
	(13,766.8)	(11,354.4)	(7,224.2)
Constant	-986,419.1***	-868,372.4***	
	(210,838.6)	(182,356.3)	
Note:			*p**p***p<0.01

5.2. Discussion of results

After running all the tests, the results of the panel data analysis are presented in Table 5 where heteroskedasticity and serial correlation consistent coefficients are presented for the variables *Total_SME*, *IndvEntr and Enterprises*. The results of the regression are somewhat similar for models with the total number of SMEs and only the number of individual entrepreneurs as dependent variables. In the model with Enterprises as the predicted variable, there are few regressors that are statistically significant. Variables Policy and Institutions showed no statistical significance in all models hence these variables will not be discussed in this chapter.

The only variable that showed a significant influence on dependent variables in all three estimated models is Salary. Firstly, the coefficient of the independent variable Salary is significant at the .05 level in all the models and has a negative effect on dependent variables. For models with the variable *IndvEntr* where random effects regression is used when Salary increases across time and between regions by 1 percentage point, the number of individual entrepreneurs decreases by 348 units on average, all other things being constant. For the model with *Enterprises* where fixed effects are more suitable, when the average monthly salary increases by 10 percentage points, the number of enterprises decreases over time, on average per region, by 105 units, other things equal. These findings are consistent with the results of other studies that were analyzed in the previous chapters. In Jablonska (2020), Czech communities' salary impact on the rate of new business formation is positive while in Polish municipalities effect is the opposite. In the case of Ukrainian regions salary effect is negative and is stronger when the total number of enterprises and individual entrepreneurs is included as the dependent variable.

Thus, higher levels of remuneration in Ukraine may work as a disincentive for starting a business. It should be noted that further analysis individual level of the effect of salary on persons' willingness to start a business individual level is needed to make conclusions and provide an explanation of why this phenomenon is observed. Nevertheless, based

on the findings of this study, it can be concluded that the average monthly salary indeed can have an effect on the number of entrepreneurs in the region.

The coefficient of an explanatory variable Gross Regional Product is statistically significant at the .001 level in the models with *IndvEntr* and *Total_SME* as dependent variables. For example, in the model with the total number of SMEs, when *GRP* changes across time and between regions by 1 percentage point, on average the number of businesses increases by 515 units, ceteris paribus. Using the lagged form of the variable also shows the positive influence on the dependent variable. The statistical significance of the variable GRP in the analysis concurs with the findings of other studies. However, the effect of GRP on the dependent variable is different. In Civera et al., (2021) the variable GDP is a proxy of the extent of economic growth of each region in Spain. The decrease in GDP per capita makes it more likely that certain community has an above-average number of businesses created. Thus, their study concludes that there is a negative relationship between economic development and the business creation rate (Civera et al., 2021).

This discrepancy in the results found in Ukrainian and Spanish regions can be explained by the overall state of the economy in both countries. Spain has an advanced economy and is the fifth-largest economy by GDP per capita in European Union while Ukraine has still an emerging developing economy. States with low levels of income (GDP) have proven to have high entrepreneurial activity compared to countries with high levels of income (Civera et al., 2021, Minniti, 2009).

In the models with *Total_SME* and *IndvEntr*, the coefficients of the independent variables *R&D, Revenue*, and *CapInv* have a significant influence on the dependent variables. The parameter estimates of *R&D* and *Revenue* variables show a strong positive effect on the dependent variables. For example, when revenue changes across time and between regions by 1 percentage point, on average the number of SMEs increases by 83 units, keeping all other variables constant. For the variable R&D, there have been similar

findings in other studies. Jablonska (2020) found that both in Polish and Czech communities there is strong evidence of the positive influence of regions' research and development expenditures on the rate of business creation. Moreover, the results of the same study showed that the regions' total yearly revenue has a statistically significant influence on the dependent variable. Civera et al. (2021) also found that in Spanish communities R&D expenditure proved to have a statistically significant positive effect on the firm creation rate.

The parameter estimates of the explanatory variable on the regions' capital investment are also statistically significant and have a negative influence in the models with *Total_SME* and *IndvEntr* as the dependent variables. Using the lagged form of the variable CapInv produced coefficient that is negative as well. Thus, with the increase in capital investment expenditures across time and between regions by 1 percentage point, on average the number of individual entrepreneurs decreases by 114 units, keeping all other things equal. This variable was included as the indicator of the overall level of development and long-term growth of businesses in regions. Thus, entrepreneurs or companies that invest in their company's growth and development and thus expand their share in the market can disincentivize the entrance of new firms (Jamieson et al., 2012).

For the model with *Enterprises* as the predicted variable, the number of large firms as well as average monthly salary has strong positive statistical significance. When the number of large firms increases by one unit, the number of enterprises increases over time, on average per region, by 193 units, other things equal. However, these results are different from what was found in related studies in other countries. For example, Civera et al. (2021) showed that the presence of large companies decreases the probability of business creation. These findings may be explained by the fact that in the Ukrainian regions, large firms do not constitute a big portion of the region's economy and may foster the development of SMEs. As argued by Jamieson et al. (2012) large businesses can be highly important in stimulating SME growth in different ways. Large firms can work with SMEs and provide guaranteed revenue streams that can help to develop

growth strategies as well as support the improvement of their operations and work processes. Another way large organizations can stimulate the growth of small and medium businesses is by training future entrepreneurs who in turn may set up their SMEs (Jamieson et al., 2012).

CHAPTER 6. CONCLUSIONS AND RECOMMENDATIONS

The analysis showed that there are certain factors that can affect entrepreneurial activity on the regional level. Variables on the region's total expenditure on research and development (R&D), total yearly gross regional product (GRP) and revenue show a positive significant effect on the number of SMEs in observed Ukrainian regions over the period from 2012 to 2020. On the other hand, the average gross monthly salary and expenditures on capital investment have a significantly negative influence on the dependent variable. Additionally, the variables that represent the number of enterprises and individual entrepreneurs were studied separately to analyze the effects of identified factors on these two groups. The results showed that for enterprises the variables on the number of large firms as well as population size have a statistically significant positive effect while the average monthly salary has an opposite effect. The analysis can have practical recommendations for the business community as well as government policy.

The results of this study can show useful insights for already functioning small and medium enterprises as well as for potential entrepreneurs who are planning to start their businesses. Firstly, the results may help entrepreneurs to identify factors that can strategically influence the operation of their small and medium businesses and anticipate certain actions to counter the negative effects. As the analysis showed, the number of small and medium enterprises is positively correlated with the revenue in a region. Thus, for already functioning businesses economic growth and the increase in R&D expenditures can be indicators of a potential rise in the number of other SMEs in a region that may have different implications for enterprises, depending on their type. For example, firms or individual entrepreneurs that mainly provide business-to-business (B2B) services can potentially benefit from the situation of an increasing number of other SMEs in the region and expand their outreach. On the other hand, the growing number of small and medium businesses in a region can create higher levels of competition and pose serious challenges to business operations in a region.

The findings on the effect of capital investment can also be useful for entrepreneurs in countervailing potential competition from the increase in the number of active businesses in a region. As the regression results showed that higher capital investment expenditures suggest a decrease in the number of SMEs. It should be pointed out that more research in this area is needed to explain this phenomenon.

For those who want to start their small business, the results of this analysis can help to indicate regions where they can have favorable conditions for their business to operate. The effect of the variable Salary that was observed in the sample can infer some useful trends for owners of SMEs. The factor and its subsequent effect that can influence future entrepreneurs' decisions depends greatly on the type of venture they would like to establish. For example, if their enterprise is oriented towards the production and distribution of goods, then they can consider regions with overall low economic development, meaning that the region's gross regional product is below the average, and where salary is smaller than the average around the country. This combination ensures that labor costs are not very high and the number of other businesses in a region is low providing a less competitive environment. For example, Kherson or Rivne oblasts can be considered viable options in this case.

For the enterprises, the regression results showed that on average the number of large firms has a positive influence on the number of enterprises in a region. The parameter estimates of the variable Salary are statistically significant as well and have a negative effect on the dependent variable. These findings on the effect of the number of large firms can be useful for enterprise owners in understanding the dynamics of competition from the rise of large firms or the increase of wages in the region. The potential challenges that can be

The results of this analysis can provide recommendations for the government and can be used in the process of developing policies that target the development of entrepreneurship. It is in the government's highest interest to have large levels of

entrepreneurial activity as it stimulates the economy, generates revenue, creates employment opportunities, and is considered one of the most important factors of economic growth. As this analysis showed, it makes sense to analyze factors and their effects separately for enterprises and individual entrepreneurs. Something that has a significant effect on enterprises may be irrelevant for individual entrepreneurs and vice versa. This observation can be considered by national as well as regional governments when developing policies that are aimed to promote entrepreneurial activity and support existing businesses.

The fact that the gross regional product of a region has a significantly positive effect on the number of SMEs can also be used by regional governments in designing policies and activities to stimulate the growth of entrepreneurship. Firstly, the government can work on boosting the levels of the regional product by supporting the growth of existing businesses. Moreover, the overall improvement of economic conditions in a region can be conducive to the creation of new businesses. Additionally, the study showed that the presence of large firms is also positively correlated with higher numbers of enterprises which can be an interesting insight for the national and regional governments. Large firms can improve the economic situation for local citizens (people become employed and get higher wages) that in turn can create conditions for others to start their own businesses that will be providing services and goods for those employed in large firms or directly work as suppliers for big firms. Governments can work on creating favorable conditions for large businesses and hence stimulate the development of SMEs.

This paper is an attempt to show some relevance in trying to answer the question of what exogenous factors can have an impact on the formation of small and medium businesses in regions. Considering the gaps and limitations of the data that was used in this study, the availability of more accurate data can help to improve this analysis. Firstly, this analysis can also be conducted to investigate the relationships on local levels (big cities or small communities). Secondly, the factors used in this study as well as other variables such as the unemployment rate, and social benefits can be used to expand the

topic of research. It is also important to mention that variables on regional governments' policies and institutions that are aimed at promoting entrepreneurial activity showed no statistical significance. In the literature related to the topic, these variables showed a significant positive effect on entrepreneurship growth. In the case of this study, this discrepancy can be potentially linked to the unsuitable measuring of the variables. Thus, in future studies, regional governments' policies and institutions can be defined differently, for example, by analyzing certain policies and their effects more substantially. Additionally, future work in this area can investigate the effects of these factors on different industries, types of enterprises and stages of their development. This type of research can open new insights and also be useful both for the business community and public policy.

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APPENDIX A

Table. Codes of each region

Region	**Code**
Cherkasy	CK
Chernihiv	CH
Chernivtsi	CV
Dnipropetrovsk	DP
Donetsk	DT
Ivano-Frankivsk	IF
Kharkiv	KK
Kherson	KS
Khmelnytskyi	KM
Kirovohrad	KH
Kyiv	KV
Luhansk	LH
Lviv	LV
Mykolaiv	MY
Odessa	OD
Poltava	PL
Rivne	RV
Sumy	SM
Ternopil	TP

Vinnytsia	VI
Volyn	VO
Zakarpattia	ZK
Zaporizhzhia	ZP
Zhytomyr	ZT

APPENDIX B

Figure 1. The number of individual entrepreneurs per 10 000 people in 12 regions from 2012 to 2020

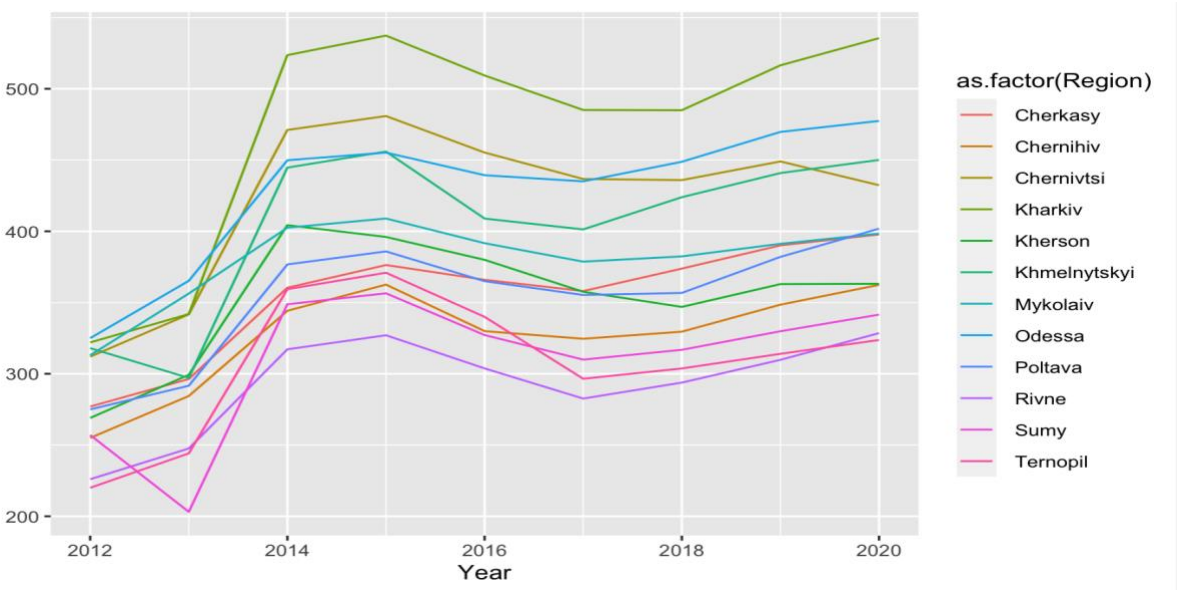

Figure 2. The number of small and medium enterprises per 10 000 people in 12 regions from 2012 to 2020