WHY THERE ARE MORE ENTREPRENEURS-MANUFACTURERS IN ONE REGIONS AND LESS IN OTHERS: AN EMPIRICAL EVIDENCE

This article describes existence differences in the level of entrepreneurship in manufacturing industry among Russian regions with particular attention to European and Siberian territories of the country. I tested the hypothesis that regions are more entrepreneurial if they will contain more urbanization, higher shares of educated and young people and better transport infrastructure. I analyzed panel data for 80 regions for a time period since 2005 till 2011 years. The estimations showed that the existence of differences were predicted by variables: the share of young people, the rate of agglomeration, the share of people with tertiary education (specialist’s diploma), the transport infrastructure and the specialization of those territories. At that time, the share of employed population with tertiary education is not significant for European part of Russia and significant for Siberia. Thus, human capital is more important for Siberian entrepreneurs than transport infrastructure than in European part of Russia.

Keywords: entrepreneurship, panel data, regional economics, regional differentiation

Introduction

Economists become more interested in studies of entrepreneurship using modern research tools. For example, they use theories of microeconomics and industrial organization and test those theories by econometrics and statistics. Now we have many papers on economics of entrepreneurship in the US, Canada, and Western Europe with emphasis on a regional level. But it is not enough papers about Russia. It is important to admit that Russian entrepreneurship had already studied by scholars during 1990s. However at this time scientists were more interested in studies on the emergence of entrepreneurship. Thus we can read some interesting papers on this issues in [6, p. 365-376], [22, p. 269-280], [16, p. 125-137], [15, p. 487-497] and others. Also, we have a lot of articles related to other topics in entrepreneurship in Russian scientific journals.

Moreover, considerable contribution to Russian studies of entrepreneurship was made by participation of Russia in Global Entrepreneurship Monitor (GEM). In addition, results of GEM were published both in reports and scientific papers by Olga Verkhovskaya and Maria Dorohina, who are the members for GEM team in Russia [1, p. 33-60], [2, p. 68-99]. They analyze social, psychological and demographical features of entrepreneurship at the national level by surveying. We also have similar papers by Simeon Djankov and others in [10, p. 352-365], [11, p. 587-597]. This authors based their research on another survey than GEM team: it was done in Russia, and China and it included not only personal and psychological sides of self-employed or employed status but covered issues related to attitudes to corruption, rule of law and other social phenomena. Their surveys covered around 5000 people. However, the number of respondents in those researches are too low for analysis on a regional level.

Although the differences on the rate of entrepreneurship among regions have developed during the transition, it was shown in the paper [7, p. 4-55]. Now it is interesting to study relationships and variables which can explain the existence of such differences.

The structure of the paper is following.

At first I will describe definitions of entrepreneurship. Because the word “entrepreneurship” has not one definition, it is important to observe main approaches for defining the meaning of it for avoidance of inaccuracies in empirical pat of the paper and conclusions respectively.

Next, I will describe some theories that can explain differences on the rate of entrepreneurship
among regions. After that, the ways of testing of this theories and data will be considered.

In the end, I will analyze estimations. They are performed on a national level and for European part of Russia and Siberia. After that I will provide some conclusions and discussions.

1. Definitions and Measurements of Entrepreneurship

There are many definitions of the words “entrepreneur” and "entrepreneurship". And it is possible to write a lot for papers and books for finding better meanings for those words. Thus, I will depict only the most popular approaches for defining them.

Most of the classic authors in pursuit to define the most correct meaning of the word “entrepreneurship” began with developing the definition of “entrepreneur.” And this logic laid in my discussion too.

Usually we presume that Richard Cantillon was the first person who introduced the definitions "entrepreneur" and “entrepreneurship”. They were presented in his book “Essay on the Nature of Trade in General.” On his words, entrepreneur is a man who redistributes risks. He (or she) buys a good on a certain price and sells it at an uncertain price. At that time, he employs workers and pays them a fixed salary. And they, workers, don’t share most of the risks with the entrepreneur [9, p. 340]. Consequently, entrepreneurship is an activity on redistribution of risks, which usually includes buying goods at a certain price and selling them for a price that is defined by market transactions.

Jean-Baptiste Say described an entrepreneur as a manager. He said that an entrepreneur had been searching for an optimal combination of factors of production. The entrepreneur in Say’s opinion is the central figure in an economy of the state. Fact causes that he (or she) manages flows of resources which are necessary for producing goods [20, p. 21-174]. Thus, entrepreneurship is an activity that contains searching for an optimal combination of resources for producing goods. In addition, J.-B. Say said that it would require not only managerial skills, but also personal characteristics like abilities to be a leader.

Joseph Schumpeter described an entrepreneur as an innovator who permanently looking for an optimal combination of resources, technologies, ways for supplying of materials and delivering goods, which can be new for a market and this type of business [21, p. 21-174]. Thus, entrepreneurship is an activity of searching and launching something new: ways of producing goods and services, technologies, managerial decisions that lead to result as emergence of a new organization, that produces and sells a good until it is valuable for the consumer.

Hence, an entrepreneurship is an activity which presumes (1) buying factors of producing on a certain prices; (2) searching for optimal combination of them in convenience with new technologies; (3) producing of goods, which are differ from old compliments; (4) selling those goods for price and quantity which are defining during market transactions. And if more than one person participates in this activity, they will co-operate and organize, i. e. it will emerge elements of hierarchy and authority for economizing all costs. In other words, entrepreneurship is not a pool of random activities, but an organized activity of one or more persons.

Note that those definitions are pure theory. When a scholar has a deal with empirical research, it is difficult to find the right way for measuring of entrepreneurship. It caused by fact that it was extremely difficult to find the measurement that will fully measure an entrepreneurial activity. Thus, scholars usually choose measurement in accordance with purposes of their research.

For example, scientists, who research labor markets describes entrepreneurs as self-employed people and entrepreneurship is measured by rate of self-employment. At that time, many scholars suppose that this approach is not absolute unbiased and state that only owners of firms, who employs and manages are truly entrepreneurs. The other point of view based on Schumpeter’s ideas where entrepreneurs measures as a number of innovative firms [18, p. 51-64].

Thus, one measures entrepreneurship as a number of self-employed people or their share in employed population or total population. There are a lot of papers with this approach [14, p. 379-402], [17, p. 345-362].

Other authors measure entrepreneurship as number of employed population in start-ups. The criteria for identification the start-ups depends from methodology of statistical bodies. This data employed in papers [15, c. 623-663], [12, c. 2-51].

Entrepreneurship can be measured by surveys too. For example, this approach was used in Global Entrepreneurship Monitor. And now we have three large datasets on entrepreneurship in Russia: Global Entrepreneurship Monitor, Russia Longitudinal Monitoring Survey-Higher School of economics (RLMS) and Complex monitoring of life conditions in Russia by Rosstat. Those datasets cover personal characteristics that are important for being an entrepreneurship. But it is difficult to
work with those surveys on a regional level. For example in RLMS does not cover all regions of Russia. Complex monitoring of life conditions in Russia by Rosstat covers all regions, but it is not a panel data and contains fewer observations than RLMS.

In this paper, an entrepreneurship is measured by the share of employment in small enterprises in the industry to a total population in a region.

2. Theory and Data

Following variables might explain some differences in the rate of entrepreneurship among regions of Russia:

1. Agglomeration. It is believed that in places with factors of producing that were allocated at a lower price, with less competition on the market and with better protection of propriety and better institutional environment, chances to be an entrepreneur would be higher. But, in fact, it does not correspond with real experience. For example, in Moscow or Saint-Petersburg are all factor of producing that have the higher price than in other regions of Russia. At the same time, share of employed people in small enterprises in manufacturing industry higher than in poor territories with lower costs for the same business. It might be explained in the following way: more economically developed regions with bigger agglomerations are better for forming an entrepreneurial environment. It means easier access for communications between entrepreneurs which creates infrastructure for further exchanging ideas, know-hows, experience and, etc. Not surprisingly, cities are better for it. And it might be more valuable resource for entrepreneurs than lower costs of establishing an enterprise.

2. Education. Educational institutions are important for obtaining skills and knowledge which are the necessity for producing goods or services. In this case I will observe people who have only tertiary education. Because higher educational institutions do not give only applied skills but also give abilities to think in a logical manner. The latter is important for successful strategies: a person with tertiary education is more able to better understand causes of unknown problems, consequently, he (or she) will be more capable of finding right solution for those problems. This is also more important than simply doing some mechanical or routine work for business success. Education is measured by the share of people with tertiary education to all employed population.

3. Age. There are many papers (and scholars) that notes that age had been significant variable in occupational choice between self-employment (to be the entrepreneur) or employment [8, p. 269-287], [13, p. 623-663]. As a rule people became an entrepreneur at 30-40 years of age, i.e. they have education and reliable professional experience. Thus, in regions with a higher share of young and middle aged population should be a better background for entrepreneurship. At the same time, big cities have a higher share of a retired population — Russian migration is not high. Most of the retired people prefer live on places where they lived during all live. Consequently, it is possible, that in the big cities will be a lower rate of entrepreneurs. Thus, this issue will be tested in my estimations further. For this reason, I chose people aged 20–34. And measured this variable as a fraction of young people to all population.

4. The Specialization of the regional economy. The specialization of a regional economy is also significant of entrepreneurs. For example, territories with more developed agricultural sector are more suitable for self-employment. The same logic is true for the industrial sector. It is tested in paper [13, p. 625-663], [12, p. 2-31]. I measured this variable as the share of employed population in industry to all employed population in the region.

5. Transport infrastructure. Places with better transport infrastructure associates with lower costs of transportation of resources for producing and delivering goods, and for allocation equipment and, etc. I measured it as the sum of densities of railroads and automobile roads per 1000 kilometers squared of a region. I summed them because usually places with higher density of railroads have higher density of automobile roads. And, moreover, all those types of roads are important for entrepreneurs. Choosing between roads depends on features of business and other micro-characteristics. Thus, I used measurement on an aggregate level.

All datasets are panel which includes 80 regions. I excluded regions which are accounted with other territories together. So, the regions were excluded: Neneckij avtonomnij okrug (accounted by Arhangel’skaya oblast’), Hanty-Mansijskij avtonomnij okrug, Jamalo-Neneckij avtonomnij okrug (accounted by Tjumenskaya oblast’). Time period starts from 2005 year and ends in 2011 year.

The descriptive statistics for all variables is shown in Table 1.

Almost 1 % of Russian population employed in small enterprises. Meanwhile, this rate is a little bit higher in European part of the country and is less in Siberia. At that time, the standard deviation for this variable is much higher in Siberia. Thus, regions in this part of Russia are more differentiated by the rate of entrepreneurship in manufacturing industry than in European part of the state.
The share of urban population is almost the same among all regions of Russia and both for European part and Siberia. Note, it is a little bit higher in Siberia.

The mean for the share of the population with tertiary education at the national level is 24.73%. It is higher in European part of the country and is less in Siberia.

The mean for the share of employed population in manufacturing industry varies across regions. At the national level, it is equal to 15%, at the European part of Russia — 17%, and for Siberia — 11%. It might be explained by facts that the most of plants and manufacturing companies are allocated in European part of Russia. Meanwhile, Siberia has more mining companies than manufacturing plants and factories.

The mean for the density of infrastructure per 1000 km sq also varies. Average rate at the national level equals to 301 km sq per 1000 km sq. In European part of Russia, where the density of population is higher, it equals to 391.9 km sq, in Siberia, where the density of population is lower, it equals to 100.95 km sq.

The share of the population aged 20–34 years is higher in Siberia (25.3%), and it is less in European part of Russia (23.3%). At the national level, it equals to 23.9%. It is caused by the fact that in Siberia is less retired population because they prefer to relocate to territories with a warmer climate. At this time, many young people migrate there for higher salaries.

3. Results of Estimations

I estimated the dependence of the share of employed population in small enterprises from industry to five variables. The model is:

\[
\ln \frac{p_{emp}}{p_{tot}} = c + \beta_1 \ln agl + \beta_2 \ln ind + \\
+ \beta_3 \ln inf + \beta_4 \ln educ + \beta_5 \ln agr,
\]

Table 1

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>St. Dev</th>
<th>Mean</th>
<th>St. Dev</th>
<th>Mean</th>
<th>St. Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of employed population by small enterprises to all population of a region</td>
<td>0.01029</td>
<td>0.00590</td>
<td>0.01099</td>
<td>0.00649</td>
<td>0.00870</td>
<td>0.00383</td>
</tr>
<tr>
<td>Share of urban population in all population of a region</td>
<td>0.6891411</td>
<td>0.13110</td>
<td>0.6821896</td>
<td>0.12899</td>
<td>0.70443</td>
<td>0.13474</td>
</tr>
<tr>
<td>Share of employed population with tertiary education to all employed population</td>
<td>0.24730</td>
<td>0.05304</td>
<td>0.24993</td>
<td>0.05726</td>
<td>0.24155</td>
<td>0.04192</td>
</tr>
<tr>
<td>Share of employed population in industry</td>
<td>0.15228</td>
<td>0.06265</td>
<td>0.17069</td>
<td>0.05415</td>
<td>0.11198</td>
<td>0.06124</td>
</tr>
<tr>
<td>Density of infrastructure per 1000 km sq</td>
<td>301,02250</td>
<td>229,43350</td>
<td>391,97140</td>
<td>215,38960</td>
<td>100,93490</td>
<td>90,34081</td>
</tr>
<tr>
<td>Share of population aged 20–34 to all population of a region</td>
<td>0.23907</td>
<td>0.01628</td>
<td>0.23286</td>
<td>0.01425</td>
<td>0.25274</td>
<td>0.01138</td>
</tr>
</tbody>
</table>

1 Calculated by dividing data «Srednespisochnaya chislennost rabotnikov (bez vneshnih sovmestiteley) po vidu ekonomicheskoy deiatelnosti «Obrabatyvajushhie proizvodstva» ["The average number of workers (without external part-time workers) by the form economic activity "Processing productions"] from factbook «Maloe i srednee predpinitatelstvo v Rossi" ["Small and Average Business in Russia"] by data «Srednegodovaya chislennost naseleniya» ["Average annual population"] from factbook «Regiony Rossi. Socialno-ekonomicheskie pokazateli» ["Regions of Russia. Socio-economic indexes"].

2 «Regiony Rossi. Socialno-ekonomicheskie pokazateli" ["Regions of Russia. Socio-economic indexes"], table «Udelnyy ves gorodskogo i selskogo naseleniya v obshchei chislennosti naseleniya" ["Specific weight of urban and country population in the total number of the population"] multiplied by 100.

3 «Sostav zanyatogo naseleniya po urovnyu obrazovaniya» [Number of the working people according education], factbook «Regiony Rossi. Socialno-ekonomicheskie pokazateli» ["Regions of Russia. Socio-economic indexes"].

4 «Raspredelenie srednegodovoy chislennosti zanyatyh v ekonomike po vidam ekonomicheskoi deiatelnostii» [Distribution of the annual number of people working in economic according the economic activity], factbook «Regiony Rossi. Socialno-ekonomicheskie pokazateli" ["Regions of Russia. Socio-economic indexes"].

5 The sum of «Plotnost zheleznodorozhnyh putey obshchego polzovaniya» [Thickness of common railway] and «Plotnost avtomobilnykh dorog obshchego polzovanija s tverdym pokrytiem» [Thickness of auto roads with the hard surface], factbook «Regiony Rossi. Socialno-ekonomicheskie pokazateli" ["Regions of Russia. Socio-economic indexes"].

6 The sum of «Chislennost postoyannogo naseleniya — muzhchin po vozrastu na 1 yanvarya (chelovek)» [Number of the constant population — men according the age for January, 1] and «Chislennost postoyannogo naseleniya — zhenshchin po vozrastu na 1 yanvarya (chelovek)» [Number of the constant population — women according the age for January, 1] to total number of population, EMISS database «Edinaya Mezhvedomstvennaya Informatsionno-Statisticheskaya Sistema» [Union Interdepartmental Informational and Statistical System].
where, \( \ln_{\text{Dep}} \) — dependent variables, log of the share of employed population in small enterprises in industry in a region \( i \), at moment \( t \); \( \ln_{\text{ag}} \) — log of the share of urban population in a region \( i \), at moment \( t \); \( \ln_{\text{edu}} \) — log of the share of employed population in industry in a region \( i \), at moment \( t \); \( \ln_{\text{inf}} \) — log of density of infrastructure per 1000 km sq in a region \( i \), at moment \( t \); \( \ln_{\text{aglit}} \) — log of the share of population aged 20–54 in all population of a region \( i \), at moment \( t \).

The model was estimated by maximum likelihood estimation for consistent coefficients with the most minimal bias. Results are in Table 2.

Estimation at a national level shows that all variables are significant. The highest coefficients belong to the agglomeration effect (the share of urban population) and to the share of the young population. Thus, it is more likely that an entrepreneurship in an industrial sector is higher in regions with the high fraction of young people and existing big cities.

At that time, it is important the existence of the same industry in the region. It is shown by significance of coefficient "share of employed people in industry." However, it is lower than coefficients for agglomeration effect and share of young people.

Not surprisingly, that education is also significant, but the coefficient is too low — it is unclear. This little value is might be explained by fact that people with college education (special education) are more necessary. It might be proceeded by quality of tertiary education and fraction of graduates in technical sciences. This issue is open for further research.

And the lowest coefficient (0.07) belongs to the variable of infrastructure quality in the region. This result is not clear too. And might be proceeded by uncovered features in this measure of infrastructure: access to it, quality, suitability, costs and load.

At a European part of Russia, we see that all coefficients for all variables are significant except the variable of fraction of people with tertiary education. The highest value has variable which is responsible for agglomeration effect. Consequently, on this part of the country entrepreneurship in manufacturing industry is located in cities and urban areas. In principle, it is caused by industrial characteristics. It is easier to establish and to run a little factory in an urban area. Moreover, large plants and factories usually locate near and around cities. Thus, the variable "share of employed population in industry" is also significant. In addition, the variable "fraction of young people" is significant and has high value of the coefficient. At this time, the coefficient of infrastructural equipment is much higher and equals to 0.119 (and also significant) than at the national level one. But the share of educated people is not significant, as mentioned above.

Estimation for Siberian regions shows quite different results than estimation at a European part of Russian and national level. For example, agglomeration effect does not significant. Maybe, it is described by heterogeneous nature of economic and urban development of Siberian regions. As a rule, the richest regions of this area locate on the North with quite difficult conditions for life. Usually cities in those places are small. At the same time, Siberian cities are bigger in a Southern part of the area. But those places usually are poor and have not good environment for entrepreneurship. It is important that most of the Siberia's people live in Southern cities. Which can lead to this unclear result.

At the same time, the variable "share of young people" is significant, and it's coefficient much higher than previous estimations. It might be caused by mobility of young people because they usually chose regions with high quality of life and better economic development. Thus, it is not surprisingly that those rich regions have a higher rate of entrepreneurship.

Note that those estimations show the existence of interrelations between variables. At this time, those relations have two-way casualty. Thus, if the share of young people with tertiary education increases in the region because, for instance, young people prefer this place in pursuing prestigious higher education degree in good universities, it will enhance the development of the regional entrepreneurship in manufacturing. On the other hand, regions with developed entrepreneurship are attractive for young people. Thus, they immigrate there firstly for education with perspectives for further career in local enterprises. Good examples are cases of large agglomerations in Russia: Moscow, Saint-Petersburg, Kazan, Yekaterinburg, Novosibirsk. The same logic is followed for urbanization.

As a rule, creation of large plants or fabrics and development of infrastructure enhance the development of entrepreneurship. The estimations confirmed these arguments and showed positive relations between variables in the model. However, the development of firms requires more infrastructure, which leads to the establishment of big enterprises and consequently leads to growth of a share of employed persons in manufacturing.
We have seen in a previous estimation, the specialization of a region is important. Not surprisingly, that coefficient for the variable “share of people with tertiary education” is high and higher than in previous estimations. The same case is truly for “infrastructure” variable. Thus, the human capital and infrastructure is much more important for entrepreneurship in Siberia than the existence of plants, factories and developed cities.

Conclusions

Panel data, which contains 80 regions, starts from 2005 year and ends up in 2011 year, was estimated by maximum likelihood method. At the national level, and both for European part of Russia and Siberia it is important and significant the existence and a high fraction of young people, specialization of a region and infrastructure. At the same time, development of cities is valuable for European part of Russia and is not for Siberia. And a fraction of people with tertiary education is more important for the latter area.

Consequently, differences among regions on a level of the entrepreneurship in industry, which was measured as a share of employed people by small enterprises, caused by historical, geographical and not only by economic conditions. It is caused by the fact that most of the cities developed many decades ago. The same logic is fair of location of plants and factories. And, moreover, this is explained by geographical and nature conditions of those places.

Table 2

<table>
<thead>
<tr>
<th>Variables</th>
<th>Russia</th>
<th>European part of Russia</th>
<th>Siberia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of urban population</td>
<td>1.13624***</td>
<td>1.50250***</td>
<td>0.31634198</td>
</tr>
<tr>
<td></td>
<td>(0.22983)</td>
<td>(0.26555)</td>
<td>(0.38485)</td>
</tr>
<tr>
<td>Share of employed population in industry</td>
<td>0.67577***</td>
<td>0.81105***</td>
<td>0.44824***</td>
</tr>
<tr>
<td></td>
<td>(0.09917)</td>
<td>(0.12598)</td>
<td>(0.14413)</td>
</tr>
<tr>
<td>Density of infrastructure per 1000 km sq</td>
<td>0.07029*</td>
<td>0.11858*</td>
<td>0.16980*</td>
</tr>
<tr>
<td></td>
<td>(0.04003)</td>
<td>(0.06764)</td>
<td>(0.06674)</td>
</tr>
<tr>
<td>Share of employed population with tertiary education to all employed population</td>
<td>0.18327*</td>
<td>0.15631433</td>
<td>0.23265*</td>
</tr>
<tr>
<td></td>
<td>(0.09407)</td>
<td>(0.12570)</td>
<td>(0.12960)</td>
</tr>
<tr>
<td>Share of population aged 20–34 in all population of a region</td>
<td>1.52836***</td>
<td>1.41005**</td>
<td>1.59367***</td>
</tr>
<tr>
<td></td>
<td>(0.42122)</td>
<td>(0.51558)</td>
<td>(0.79086)</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.88031391</td>
<td>-0.99906197</td>
<td>-1.9016581</td>
</tr>
<tr>
<td></td>
<td>(0.70478)</td>
<td>(0.92053)</td>
<td>(1.25973)</td>
</tr>
<tr>
<td>Number of observations</td>
<td>552</td>
<td>383</td>
<td>169</td>
</tr>
</tbody>
</table>

Significance of coefficients: ‘ 90 %, † 95 %, ‡ 99,9 %
Standard errors are in brackets

References


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