

# COVID-19 Pandemic and Differentiation of Entrepreneurial Activity in Russian Regions in the Context of Sustainable Development

Irina Korchagina<sup>a</sup>

*Institute of Economics and Management, Kemerovo State University, Krasnaya Street, 6, Kemerovo, Russia*

**Keywords:** Small and Medium-Sized Businesses, Russian Economy, Regions of Russia, COVID-19 Pandemic, Taxation of Small and Medium-Sized Enterprises, Sustainable Development.

**Abstract:** The purpose of the study is to assess regional differences in the response of small and medium-sized enterprises in Russia to the 2020 crisis caused by the COVID-19 pandemic. Research methods: statistical methods of analysis of variation series, correlation analysis, cluster analysis. There is no relationship between the level of socio-economic development of the region and the decline in the number of small and medium-sized enterprises, the number of personnel, and tax collections. In most regions, the number of enterprises decreased by 4.2–4.3%. This indicator is the least volatile; the distribution is close to normal. Staff numbers and tax collections vary more. There is no correlation between the number of small and medium-sized enterprises, the number of employees, and receipts from special tax regimes due to the legalization of employment, government support measures, and tightening of tax administration. Most regions of Russia form two clusters. The first differs from the second in a higher level of losses in the number of small and medium-sized enterprises, tax revenues from them and a lower level of employment losses. Maintaining the same level of tax revenues could negatively affect employment in the segment of small and medium-sized enterprises.


## 1 INTRODUCTION

The problem of transition to sustainable development of the whole world, individual countries and territories is multifaceted and extremely complex. But, of course, one of its important parts is the formation of a strong small and medium-sized business sector at all levels. This is provided for by the Sustainable Development Goals and targets set out in the documents of the United Nations.

Thus, goal 8 includes task 8.2 “Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services”. Goal 9 sets target 9.3 “Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, and their integration into value chains and markets” (United Nations, 2015).

Consequently, the UN global agenda encompasses support for entrepreneurship, including innovative entrepreneurship that creates new technologies; the integration of small and medium-sized enterprises into global value chains; providing such enterprises with access to infrastructure and resources. This is because the contribution of small and medium-sized enterprises to sustainable development is very large (Condon, 2004).

It covers, in particular, the introduction of environmental innovations by technology entrepreneurs (Bucea-Manea-Tonis, 2015), the social responsibility of small and medium-sized enterprises to harmonize the interests of business, workers, the local community, reduce environmental damage (Prashar, 2019), create workers jobs and unemployment reduction, especially in developing countries and regions (Diabate et al., 2019). Strengthening social responsibility and green technologies in small and medium-sized enterprises is essential for sustainable development (Jansson et al., 2017; Wielgórka, 2016).

<sup>a</sup> <https://orcid.org/0000-0002-3297-3259>

Due to their flexibility, quick response to changes, high business activity, small and medium-sized enterprises increase the economic stability of countries and territories. They make a significant contribution to the creation of the gross national product, employment, investment, and can develop and introduce new technologies. An economy with a low level of entrepreneurship development, an insufficient share of small and medium-sized enterprises in macroeconomic indicators is unstable and unbalanced.

At the same time, small and medium-sized enterprises were hardest hit in 2020 due to the COVID-19 pandemic and restrictions on business activities. This makes it difficult to achieve the goals of sustainable development of small and medium-sized businesses. In this regard, the “A UN framework for the immediate socio-economic response to COVID-19” adopted in April 2020 sets the task “Protecting jobs, supporting small and medium-sized enterprises, and informal sector workers through economic response and recovery programs”(United Nations, 2020).

This requires an assessment of the situation of small and medium-sized businesses in different countries and regions of the world. The impact of the COVID-19 pandemic on small and medium-sized enterprises in developed and developing countries has begun to be discussed in a number of papers. Most researchers agree that it is small and medium-sized enterprises that are most affected by the pandemic and the resulting restrictive measures. In the United States, after two months of active social distancing from February to April, there was the largest drop in the number of individual business owners by 22%, from 15.0 to 11.7 million people. By comparison, the decline was 5% during the Great Depression (Fairlie, 2020).

In June 2020, about 50% of SMEs in the United States planned to close if the lockdown were extended for another three months (Liguori and Pittz, 2020). A study from a survey of 5,800 US entrepreneurs found that more than 40% of small businesses were closed permanently or temporarily, the number of full-time employees decreased by 32% in February-March (Bartik et al., 2020).

Pakistani entrepreneurs gave similar responses to the survey, with over 70% reporting that they were unable to survive even two months of lockdown (Shafi et al., 2020). In Egypt, the economic imbalance in favor of big business has increased, as small and medium-sized enterprises have been significantly more affected by restrictive measures (Zaazou and Abdou, 2021). In Armenia, it was in small and

medium-sized enterprises that the highest risk of job and wage cuts was observed in 2020 (Beglaryan and Shakhmuradyan, 2020).

The impact of the COVID-19 pandemic on small and medium-sized enterprises in Russia has not yet been studied in detail, although in general its negative impact is quite obvious. Thus, business activity in the small and medium-sized business sector fell by 40%, and the deficit of state support is estimated by Russian researchers as twofold (Razumovskaia et al., 2020).

Therefore, further research is needed on how small and medium-sized businesses in Russia reacted to the 2020 crisis. In addition, a regional analysis of this problem is important, since different territories of Russia differ significantly both in the level of development of small and medium-sized businesses, and in their response to the pandemic and restrictive measures.

Therefore, the purpose of the article is to analyze the regional differentiation of the reaction of small and medium-sized businesses in Russia to the crisis caused by the COVID-19 pandemic and restrictive measures.

## 2 RESEARCH METHODOLOGY

A quantitative research methodology was used to answer the research questions posed. We proceeded from the fact that the level of development of small and medium-sized businesses in the country and in the region is characterized by three main indicators that are currently available for research: the number of small and medium-sized enterprises, the average number of their employees, and tax revenues from small and medium-sized enterprises.

The first two indicators are obtained from the data of the Register of Small and Medium Enterprises of the Federal Tax Service of Russia (FTS) (Federal Tax Service of Russia, 2021a). The third indicator was obtained from data on tax receipts related to special tax regimes, according to the “Report on Form No. 1-HM” published by the Federal Tax Service of Russia (2021b). It is these taxes that are paid by small and medium-sized enterprises in Russia. For the first and second of the considered indicators, the rates of increase (decrease) were calculated as of January 10, 2021 in relation to January 10, 2020 (the register is updated on the 10th day of each month). The third indicator was used to calculate the rate of growth (decline) in 2020 in relation to 2019. The use of relative indicators allows us to compare the regions of Russia without taking into account their size.

The data obtained were processed by standard statistical methods for studying variation, including descriptive statistics, analysis of variance, distribution kurtosis, analysis of means, assessment of the nature of distribution and asymmetry. The Sturges formula is used to construct one-dimensional groupings. Multidimensional grouping of Russian regions was carried out by cluster analysis using the k-means method in the SPSS Statistics 19.0 software environment. The correlation coefficient was also used to assess the relationship between various indicators.

### 3 RESEARCH RESULTS

Descriptive statistics on indicators characterizing the reaction of small and medium-sized enterprises in Russia to the 2020 crisis are presented in Table 1.

Table 1: Descriptive statistics of the growth rates of entrepreneurial activity indicators in the regions of Russia.

	Number of small and medium-sized enterprises	Average number of employees	Tax revenues
Simple arithmetic mean	-4.06	2.11	-2.28
Weighted average for Russia as a whole	-3.93	1.10	-24.01
Maximum value	4.96	163.70	27.69
Minimum value	-9.09	-6.71	-83.95
Swipe variation	14.05	170.41	111.64
The coefficient of variation	57.75	852.98	560.78
Median value	-4.26	0.00	-0.54
Modal meaning	-	0.00	-
Variance (corrected)	22.26	332.79	170.84
Distribution kurtosis	2.47	74.15	20.89
Standard deviation	2.35	18.01	12.79
Asymmetry	-2.34	8.83	-4.22

The variation in the growth rates of all indicators of entrepreneurial activity across the regions of

Russia in 2020 was very large, but its main part falls on a small number of regions with abnormal “emissions” indicators. The most stable and least volatile indicator is the growth rate of the number of small and medium-sized enterprises. Here are the smallest values of skewness (-2.34) and deviations from the normal distribution. The left-sided asymmetry means that in most regions the decline in the number of small and medium-sized enterprises was above average (since in this case negative values are considered).

This is also confirmed by the ratio of the arithmetic mean and median value. A decrease in the number of small and medium-sized enterprises by 4.2-4.3%, rather than 3.9-4.0%, can be considered more typical for the regions of Russia. The nature of distribution and the formation of asymmetry was significantly influenced by the fact that in five regions (Republic of Buryatia, Republic of Dagestan, Chukotka autonomous district, Rostov Region, Leningrad Region) the number of small and medium-sized enterprises increased, despite the crisis, and in three more (Nenets autonomous district, Moscow region, Leningrad region) changed slightly.

Table 2 shows the distribution of Russian regions into 7 groups (based on the Sturges formula and the number of research objects) according to the rate of increase (decrease) in the number of small and medium-sized enterprises.

Table 2: Distribution of Russian regions by the rate of increase (decrease) in the number of small and medium-sized enterprises in 2020.

Group	Regions
First (from 4.96% to 2.96%)	2 regions
Second (from 2.96% to 0.96%)	1 region
Third (from 0.96% to -1.04%)	5 regions
Fourth (from -1.04% to -3.04%)	13 regions
Fifth (from -3.04% to -5.04%)	37 regions
Sixth (from -5.04% to -7.04%)	22 regions
Seventh (more than -7.04%)	5 regions

From the data in Table 2, it can be seen that more than 40% of regions fall into the fifth group, where the rate of increase (decrease) in the number of small and medium-sized enterprises ranges from 3.04% to 5.04%. Another 22 regions or more than 25% of them were in the sixth group, where the growth rates varied from -5.04 to -7.04%. Thus, in more than 75% of regions, more than 3% of small and medium-sized enterprises were lost in a year. At the same time, it was possible to reduce or even increase entrepreneurial activity in 7 regions.

The indicator of the growth (decrease) rates of the average number of employees employed in small and

medium-sized businesses is even more variable. In many regions, paradoxically, it had positive dynamics. The median and modal value is equal to zero, in 46 regions out of 85 (about 55%) the number of employed in small and medium-sized enterprises, at least, has not decreased. Anomalous values in the Chechen Republic (163.7%) and the Republic of Ingushetia (16.3%) give significant variation to a number.

Therefore, there is a high level of right-sided asymmetry; in most regions, the growth rate of the average number of employees was below the average level. Nevertheless, only in 15 regions out of 85 (about 18%) the decrease in the number of personnel of small and medium-sized enterprises was more than 2%. The worst dynamics was demonstrated by the Republic of Khakassia, Astrakhan Region, Jewish autonomous district, Arkhangelsk Region, where the decline exceeded 5%. However, this is an uncharacteristic indicator for most regions.

Tax revenues from special tax regimes have declined in most regions of Russia. Three special tax regimes were considered – a simplified taxation system, a single tax on imputed income, and a single agricultural tax. Almost all small and medium-sized enterprises use them. Unlike corporate property tax or personal income tax, revenues from these tax regimes are related to the scale and efficiency of the entrepreneur's activities.

The increase in fees, however, was noted in 41 regions (or 48% of their total number), and in 24 – by 3% or more. The highest growth rates took place in the Chechen Republic (about 27.7%), the Magadan region (about 12.6%), the Republic of Adygea (about 7.7%), and the Ulyanovsk region (about 7.3%). At the same time, in 9 regions the decline was more than 10%, in particular, in the Sakhalin region – by 84%, in the Nenets Autonomous District – 56%, Kamchatka Territory – over 22%, the Komi Republic – about 19%, Tyumen region – more than 16%.

The variation in the rate of increase (decrease) in tax revenues is characterized by the Poisson distribution, which means the presence of rare events (a decrease in tax revenues from small and medium enterprises in some regions to almost zero or one and a half to two times). As a consequence, the variation in tax levies for maximum and minimum emissions is very high. In general, for the national economy of Russia, the decrease in revenues from special tax regimes was about 24%, on average for the regions – 2.3%, while the median is close to zero. Consequently, in a significant part of Russian regions, tax revenues from small and medium-sized enterprises increased, despite the crisis.

## 4 THE DISCUSSION OF THE RESULTS

The study confirms the hypothesis of deep regional disparities in the level of entrepreneurial activity in the context of the COVID-19 pandemic and restrictive measures. The spread of three key indicators – the number of small and medium-sized enterprises, the number of employees, tax collections – is very large. This is evidenced by the main indicators assessing the variation series (variance, standard deviation, coefficient of variation). This conclusion confirms the manifestation of the asymmetry of regional development characteristic of Russia.

In general, the depth of the fall of small and medium-sized businesses is below the level of developed countries, but inside the Russian economy there are territories with completely different indicators. For example, the Republic of Crimea, as noted above, has lost more than 9% of small and medium-sized enterprises, which corresponds to the world level, and in the Chukotka Autonomous District their number, despite the crisis, increased by 5%.

The three studied indicators, paradoxically, do not demonstrate statistically significant relationships. According to standard economic concepts, in a crisis, the number of small and medium-sized enterprises, the number of their personnel and tax payments should simultaneously decrease. However, in fact, this did not happen. The number of small and medium-sized entrepreneurs themselves has decreased in the overwhelming majority of regions, but this is not typical for the other two indicators.

The correlation coefficient between the rates of growth (decline) in the number of small and medium-sized enterprises and their employees was 0.0517. The critical value of this coefficient at 80 degrees of freedom and significance level  $\alpha = 0.05$  is 0.2172. Consequently, the decrease in the number of entrepreneurs had practically no effect on the average number of employees. This can only be explained by the legalization of shadow employment of small and medium-sized businesses under the influence of government support measures. This process was especially active in the predominantly agrarian republics of the North Caucasus Federal District.

The correlation coefficient between the rates of growth (decrease) in the number of small and medium-sized enterprises and revenues from special tax regimes was  $-0.1594$ , which is also below the critical level of significance. With a moderate drop in the number of small and medium-sized enterprises,

tax revenues from them fell to a much lesser extent if we consider the arithmetic mean and modal value in the regional context. In the national economy as a whole, the decline was very deep (about 195 billion rubbles), but almost this entire amount fell on the Sakhalin Oblast. Here, the rates for the simplified taxation system were reduced to a minimum. The main reason is to improve efficiency and tighten tax administration. The increase in the transparency of the smallest and medium-sized businesses interested in state support also had an impact. The correlation coefficient between the headcount of small and medium-sized enterprises and tax revenues from special tax regimes was 0.2541, which is slightly above the critical level of significance. However, multicollinearity of indicators took place here, due to the third factor – a general tightening of administration and an increase in the information openness of business.

It should be noted that the dynamics of entrepreneurial activity in 2020 did not reveal any obvious links with the level of socio-economic development of the region, previously established parameters of the entrepreneurial sector. For example, the fourth group of regions (Table 2), where the number of small and medium-sized enterprises has decreased by 1-3%, includes the leading cities in terms of economic development, the City of Moscow, the Republic of Tatarstan and, at the same time, one of the least developed regions – the Republic of Kalmykia, the Republic of Altai, and the Republic of Tyva. There are also middle regions in this group in terms of the main socio-economic indicators.

Taking into account the significant territorial differentiation of entrepreneurial activity, a cluster analysis was carried out with the aim of multidimensional classification and search for characteristic groups of regions, profiles of their entrepreneurial activity. The best results were obtained by identifying 7 clusters. The distribution of regions by clusters is shown in Table 3.

Table 3: Distribution of Russian regions by clusters.

1 cluster – 1 region
2 cluster – 4 regions
3 cluster – 39 regions
4 cluster – 7 regions
5 cluster – 32 regions
6 cluster – 1 region
7 cluster – 1 region

The final centres of the clusters are shown in Table 4.

Table 4: End centres of clusters.

	1	2	3	4	5	6	7
Number of small and medium enter-prises	27.7	0.7	- 2.7	- 16.8	4.4	- 56.3	- 83.9
Ave-rage number of employees	-4.0	1.3	- 3.9	-4.5	-4.7	-0.3	-1.5
Tax revenues	163.7	8.6	- 0.4	-1.2	0.01	5.4	-0.6

The data in Tables 3 and 4 show that most of the regions of Russia (71 out of 85 or about 85%) are included in the third and fifth clusters. The third cluster is characterized by a moderate decline in all indicators of entrepreneurial activity, including the average number of employees in small and medium-sized enterprises. At the same time, employment losses are somewhat lower here than in the fifth cluster, and tax revenues are higher (the final centres of clusters are not necessarily associated with specific average values of indicators, but allow the clusters to be compared with each other).

In the fifth cluster, compared to the third, the crisis had less impact on the total number of small and medium-sized enterprises and more on employment. Tax revenues from small and medium-sized businesses have been preserved to a greater extent. It should be noted that the clusters do not differ significantly in terms of the general level of socio-economic development of the regions. In both groups there are leading, lagging and average territories in terms of the main socio-economic indicators.

The fourth cluster is specific, where the northern regions of Russia are represented. Here, the highest rates of decline in the number of small and medium-sized enterprises and the maximum losses in tax revenues are observed. Apparently, in the economy of these regions, small and medium-sized enterprises were already in a difficult situation, which worsened in 2020. At the same time, in terms of the rate of decrease in the average headcount, the fourth cluster occupies an average position between the third and fifth.

The second cluster unites such different regions as the Republic of Ingushetia, the Republic of Dagestan, the Leningrad region and the city of Moscow. Small and medium-sized businesses here were least affected by the crisis. In the first two regions this is explained by the agrarian specialization of the economy, in the other two – by a high level of economic development, a capacious regional market and large-scale support measures. Here the number of small and medium-sized enterprises has increased, and tax revenues from

them have increased. A much more favourable situation with the dynamics of the number of personnel of small and medium-sized enterprises.

Separate clusters with pronounced regional features are formed by the Chechen Republic (rapid legalization of small and medium-sized businesses), the Nenets autonomous district and the Sakhalin Region (large-scale support for small and medium-sized enterprises through a sharp reduction in taxes, which made it possible to preserve and even increase their number and headcount).

## 5 CONCLUSIONS

Small and medium-sized businesses are very important for the sustainable development of regions and countries. However, it was hit hardest by the COVID-19 pandemic and the restrictions imposed in connection with it. In large and heterogeneous countries such as Russia, it is necessary to study the response of small and medium-sized enterprises to the pandemic from a regional perspective. The variation in the rate of increase (decrease) in entrepreneurial activity was high. The closest to the normal distribution is the rate of growth (decline) in the number of small and medium-sized enterprises, the median value of which is close to 4.2–4.3%. In some regions (7 observations), on the contrary, this indicator grew.

The rate of growth (decline) in the number of personnel was more varied and differed in greater asymmetry, and its modal and median values were equal to zero. In half of the regions, the number of employed in small and medium-sized enterprises, at least, has not decreased. Almost 50% of the regions showed an increase in tax collections from small and medium-sized enterprises. This is the most variable Poisson exponent. In some regions, it decreased by 50–80%.

There are no correlations between the studied indicators in the regional aspect. The decrease in the number of small and medium-sized enterprises did not lead to a similar decrease in the number of employees (correlation coefficient 0.0517). There is also no connection with the receipt of taxes from special tax regimes (coefficient –0.1594). This is explained by measures to preserve employment in exchange for its legalization, as well as an increase in the degree of transparency of small and medium-sized businesses, and a tightening of tax administration.

The reaction of small and medium-sized businesses to the crisis of 2020 practically did not depend on the level of socio-economic development

of the region and other obvious factors. Both the leading and lagging regions had a similar rate of decline in the number of small and medium-sized enterprises. Cluster analysis showed that one of the two largest clusters differs from the other in terms of a higher level of losses in the number of small and medium-sized enterprises, tax revenues from them and a lower level of employment losses. Maintaining the same level of tax revenues could negatively affect employment in the segment of small and medium-sized enterprises. There are also smaller clusters with positive growth rates of entrepreneurial activity. This is due to either the agrarian specialization of the economy, or active tax support, or an initially high level of economic development.

## REFERENCES

- Bartik, A., Bertrand, M., Cullen, Z., Glaeser, E., Luca, M., and Stanton C. (2020). The impact of COVID-19 on small business outcomes and expectations, *Proceedings of the National Academy of Sciences*, 117(30), 17656–17666.
- Beglaryan, M. and Shakhmuradyan, G. (2020). The impact of COVID-19 on small and medium-sized enterprises in Armenia: Evidence from a labor force survey, *Small Business International Review*, 4(2): e298.
- Bucea-Manea-Tonis, R. (2015). SMEs role in achieving sustainable development, *Journal of Economic Development Environment and People*, 4(1): 41–50.
- Condon, L. (2004). Sustainability and small to medium sized enterprises – how to engage them, *Australian Journal of Environmental Education*, 20(1): 57–67.
- Diabate, A., Sibiri, H., Wang, L., and Yu, L. (2019). Assessing SMEs' sustainable growth through entrepreneurs' ability and entrepreneurial orientation: An insight into SMEs in Côte d'Ivoire. *Sustainability*, 11(24): 7149.
- Fairlie, R. (2020). The impact of COVID-19 on small business owners: Evidence from the first 3 months after widespread social-distancing restrictions, *Journal of Economics & Management Strategy*, 29(4): 727–740.
- Federal Tax Service of Russia (2021a). *Unified register of small and medium-sized businesses*. Retrieved from <https://rmsp.nalog.ru/index.html>
- Federal Tax Service of Russia (2021b). *Data on forms of statistical tax reporting. Receipt of taxes, charges and other mandatory payments to the consolidated budget of the Russian Federation*, [https://www.nalog.ru/rn42/related\\_activities/statistics\\_and\\_analytics/forms/9777509/](https://www.nalog.ru/rn42/related_activities/statistics_and_analytics/forms/9777509/)
- Jansson, J., Nilsson, J., Modig, F., and Hed Vall, G. (2017). Commitment to sustainability in small and medium-sized enterprises: The influence of strategic orientations and management values, *Business Strategy and the Environment*, 26(1): 69–83.

- Liguori, E. and Pittz, T. (2020). Strategies for small business: Surviving and thriving in the era of COVID-19, *Journal of the International Council for Small Business*, 1(2): 106–110.
- Prashar, A. (2019). Towards sustainable development in industrial small and Medium-sized Enterprises: An energy sustainability approach, *Journal of Cleaner Production*, 235(10): 977–996.
- Razumovskaia, E., Yuzvovich, L., Kniazeva, E., Klimenko M., and Shelyakin V. (2020). The effectiveness of russian government policy to support SMEs in the COVID-19 pandemic, *Journal of Open Innovation: Technology, Market, and Complexity*, 6(4): 160.
- Shafi, M., Liu, J., and Ren, W. (2020). Impact of COVID-19 pandemic on micro, small, and medium-sized enterprises operating in Pakistan, *Research in Globalization*, 2: 100018.
- United Nations. (2020). *A UN framework for the immediate socio-economic response to COVID-19*, [https://www.un.org/sites/un2.un.org/files/un\\_framework\\_report\\_on\\_covid-19.pdf](https://www.un.org/sites/un2.un.org/files/un_framework_report_on_covid-19.pdf).
- United Nations. General Assembly (2015). *Resolution adopted by the General Assembly on 25 September 2015 “Transforming our world: the 2030 Agenda for Sustainable Development”*, 70(1), [https://www.un.org/ga/search/view\\_doc.asp?symbol=A/RES/70/1&Lang=E](https://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E).
- Wielgórka, D. (2016). Environmental management in the aspect of sustainable development in micro-, small-, and medium-sized enterprises, *Desalination and Water Treatment*, 57(3): 982–992.
- Zaazou, Z. and Salman Abdou, D. (2021). Egyptian small and medium sized enterprises’ battle against COVID-19 pandemic: March – July 2020, *Journal of Humanities and Applied Social Sciences*, 3(2).