Entrepreneurial Business and Economics Review

2021, Vol. 9, No. 3

10.15678/EBER.2021.090308

Assessing regional growth of small business in Russia

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ABSTRACT

Objective: The objective of the article is to estimate small business development across regions of the Far Eastern District in Russia with regard to economic, social and environmental dimensions of sustainability.

Research Design & Methods: For this, a mathematical model was built. Based on the relationship between the basic indicators of small business development, the growth leaders and laggers among the examined regions were identified.

Findings: The results of modelling suggest that small businesses in the Far Eastern District will not be able to enhance their profitability and offer larger salaries by 2024.

Implications & Recommendations: Hence, one of the major challenges is the search for ways to increase profitability. Emissions from stationary sources per small enterprise will continue to grow during the next 20 years.

Contribution & Value Added: The results of this study may be useful in determining business policy directions, appropriate mechanisms, and parameters to ensure effective business development at the local, regional, and global levels.

Article type: research article

Keywords: regional growth; enterprise; entrepreneurship; small business; profit; salary; emissions; performance; model

JEL codes: M10, M19

Received: 18 January 2021 Revised: 13 April 2021 Accepted: 30 April 2021

Suggested citation:

Mutalimov, V., Kovaleva, I., Mikhaylov, A., & Stepanova, D. (2021). Assessing the regional growth of small business in Russia. *Entrepreneurial Business and Economics Review,* 9(3), 119-133. https://doi.org/10.15678/EBER.2021.090308

INTRODUCTION

A favourable business environment is a basis for business development and economic growth. Today's economic climate creates opportunities for the broad mobilisation of financial, labour, information, material and other resources. Small-scale business with its flexibility and agility can be considered a key area of entrepreneurship development. Small businesses are more effective in reaching markets than larger ones, building closer relationship with consumers, and unlocking the intellectual potential of all employees (Aymen *et al.,* 2019). Small and medium-sized (or midsize) businesses are among the major drivers of a country's economic performance, job creation, and international competitiveness (Gričar *et al.,* 2019). They generate a substantial portion of goods and services provided. Today, small and mid-size businesses (SMBs) belong to the fastest growing segment of businesses (Ramdan *et al.,* 2020). Countries leading the world in economic growth provide support to SMBs, thereby stimulating innovation within organisations, enhancing the competitiveness of products and services, and contributing to a high standard of living (Scuotto *et al.,* 2020).

The global business environment is highly competitive and hence companies must be proactive and able to withstand the competition. Thus, entrepreneurial orientation is a strategic means of improving SMBs' performance. The development of market relations is directly linked to performance. A strong small business ecosystem as a driver of international competitiveness is characteristic of a developed economy. In modern conditions, small business is no longer only a factor of a country's welfare, but a

determinant of sustainable development, capable of influencing the solution of regional and global problems. At the same time, compliance with the principles of sustainable development is of particular importance, since the functioning of small businesses must be supported by economic, social, and environmental components (Dudin *et al.,* 2019). At the same time, there are differences in the analysis of each of the constituent components of sustainable development of small business, which consist in varying speed of the changes being made in the corresponding specific indicators. There is a need for the development of methodological tools for diagnosing the development of small businesses in regions, which makes it possible to take into account the components of their sustainable growth. Therefore, this study is aimed at filling the identified scientific gap by determining the conditions for the successful functioning of small businesses as a component of a sustainable business environment.

The scientific contribution of this study is the formation of a methodological approach to assessing the development of small businesses in regions, which allows the integration the economic, social, and environmental components of this process. It provides an opportunity to take into account the differences in the development of each of the constituent elements, identify the most vulnerable component and substantiate appropriate measures to increase the level of development of small businesses. It allows one to model taking into account different combinations of the influence of one or another component. This can serve as an additional tool for making strategic and political decisions at the state level, which can also affect global sustainable development as a whole.

The methodology of this study is based on a system of differential equations in combination with regression modelling. In this case, the development process is defined as a change in the corresponding indicators over time, taking into account the dynamics of indicators of the economic, social, and environmental components.

The research structure includes Literature Review, Materials and Methods, Results and Discussion, and Conclusions. The study conducted a literature review based on modern sources, which indicates that the same factor of entrepreneurship can influence small businesses in different ways depending on a region and its development. The Materials and Methods section reveals the logic of the proposed methodological approach to assessing the development of entrepreneurship. In the Results, the modelling of real processes of the development of small business was carried out using specific indicators for the economic (total profit of small enterprises), social (average monthly wages of those employed in small enterprises), and environmental components (emissions of harmful substances from stationary sources of pollution per one small enterprise). The discussion part is also described, including the advantages and limitations of this study in comparison with the achievements of other scientists. Based on the testing of the proposed methodological approach, conclusions are formed that emphasize the obtained results, include recommendations for the development of small businesses in Russian regions, and describe the prospects for research.

LITERATURE REVIEW

The new forms of business are economically attractive. Small businesses are easier to manage in a turbulent environment when compared to larger companies, hence, small business executives have fewer troubles making regular tax payments (Peprah *et al.*, 2020). The development of small business falls under the responsibility of institutions providing employment services. At the same time, it facilitates the creation of more comfortable and convenient living conditions in a country (Salcedo-Perez & Contreras, 2018). In times of a crisis, SMBs have unique development prospects. Thanks to their mobility and flexibility, they can successfully overcome the employment-related challenges, help employees terminated from large companies to socially adapt by hiring them for specific jobs, create new segments in the market, and provide new opportunities for economic growth (Ismail *et al.*, 2018). At the same time, the current policy regarding SMBs is not enough and new support mechanisms must be created.

All dimensions of entrepreneurial orientation have a significant impact on SMBs' performance; business opportunity, inclusive innovation, dynamic operations, value adding activities, risk-taking, and innovative decisions are among them (Adegbuyi *et al.*, 2018). The strength of the behavioural de-

velopment of small business managers relies on a greater focus on the market and resources, on improving planning and organisation strategies, and on raising awareness of the need for innovation (Coda *et al.*, 2018). Microfinance products, especially microloans, among other things, have a positive effect on the growth of small businesses (Gyimah & Boachie, 2018). The advancement and availability of information and communication technologies (ICTs) help business organisations to effectively produce and sell their products and services in the global market. Yet, many small companies have not adopted such technology, especially online stores and marketing innovations, to support their business activities (Boichenko *et al.*, 2020; Suhartanto & Leo, 2020).

The role of small businesses in the economy stems from their unique functions. In a sense, small businesses are monopoly killers: the more independent sellers on the market offering identical goods or services, the lower risk of price manipulations (Rohaeni & Sutawidjaya, 2020). Because small businesses are more sensitive to market changes, the substantial share of the small businesses sector in the structure of national economy makes it more flexible (Sohilauw *et al.*, 2020). The contribution of small businesses to scientific and technological development is significant, especially in areas such as electronics, cybernetics, and computational technology. Small firms accelerate the application of modern technology-related and economic ideas and release more high-tech products than large firms do. By doing so, they benchmark the enterprise standards (Fitriatia *et al.*, 2020). The small businesses growth creates new jobs and hence drives employment (Amoah & Amoah, 2018). Another important function of small business is to smooth over social tensions and democratic market relations (Mpaata *et al.*, 2020). Consequently, the core function of small business is to enhance socio-political sustainability while offering a broad range of business activities and methods for firms to choose from.

To date, eight approaches to modelling small business development have been identified. They include stochastic, evolutionary, resource, managerial, econophysical, knowledge-based, phased, and sustainable approaches (Wach, 2020). Reducing the environmental impact of SMBs in the production of goods and services is a key success factor in greening the economy (Baranova & Paterson, 2017). Even when it is known that improving environmental performance improves the competitiveness of a small business, a lack of relevant knowledge and experience discourages the use of environmentally sound options. At the same time, the limited internal resources of small enterprises contribute to the choice of a development strategy with minimal risks, with less willingness to invest in new technologies, partly as a result of the uncertainty of the payback period (De *et al.*, 2020). One of the main competitive advantages of a company is also a modern reality characterised by sustainable development. Taking only one approach to sustainability and ignoring others can make it difficult for businesses to compete at a high level (Álvarez Jaramillo *et al.*, 2019).

One factor can influence small business in different ways depending on a region and its level of development. At the same time, it is impossible to draw an accurate list of entrepreneurship factors influencing small businesses in Russian regions. For this, it is necessary to evaluate entrepreneurs' opinions and conduct a statistical analysis of factors across regional clusters (Shamalova *et al.*, 2020). Over the past years, significant efforts were undertaken in Russia to create favorable conditions for entrepreneurship development. As a result, the entrepreneurship sector has undergone quantitative and qualitative changes. Nevertheless, Russian economic levers to enhance small business sometimes do not take into account the regional specifics of entrepreneurial activity, which play an important role in developing the whole business sector (Pinkovtskaia *et al.*, 2019). The multidimensionality of the above issues predetermines the need for a qualitatively new direction of the research into the prerequisites, levels of development, and odds of business activity in the Far Eastern Federal District.

Considering the scientific potential of the given problem, there is a need for a more in-depth conceptual study of provisions regarding the formation of structural, organisational and economic foundations for regional small business development. For this, the study builds a model showing the consequences of the key socio-economic determinants, improves the mechanism of infrastructural support, and develops a range of appropriate proposals for transforming the interaction between business entities. The purpose of the study is to estimate small business development across regions of the Far

Eastern District of the Russian Federation with regard to economic, social, and environmental dimensions. In the process of achieving the goal, taking into account the review of modern literature, the following hypotheses were formed:

H1: the effectiveness of small business development in Russian regions depends on changes in economic indicators only.

H2: the effectiveness of small business development in Russian regions should have a comprehensive basis, including economic, environmental, and social components.

To confirm or refute the hypotheses formed in the study, the following scientific questions were posed:

- first, to determine the relationship between the number of small businesses and their turnover, as well as the number of small businesses per 10 000 people and their average number in the regions to highlight distribution trends;
- secondly, to carry out modelling of the economic, social, and environmental components of the development of small businesses in regions;
- thirdly, to determine the level of efficiency of small business development in the studied regions, taking into account three components.

RESEARCH METHODOLOGY

This study assumes that small business development in the Far Eastern District takes place in a sustainable way and has three dimensions: economic, social, and environmental. The rate of quantitative business changes varies between dimensions. For business entities, the process of development can be expressed by the following differential equation:

$$F(\bar{y}', t) = \frac{d\,\bar{y}\,(t)}{dt} \tag{1}$$

where $F(\bar{y}', t)$ is the function of dependence between the process of development and a vector derivative of $\bar{y}$ with respect to time; $\bar{y}$ is the vector of indicators representing the forms in which economic, social, and environmental components of development manifest; $d\,\bar{y}\,(t)/dt$ – is the first-order derivative of $y(t)$ with respect to time. In general, the first-order derivative reflects the instantaneous rate of change.

When modelling small business development, one should keep in mind that alterations in all components are interrelated. Therefore, the system of differential equations for the economic, social, and environmental components of development will be expressed as:

$$\begin{cases} F_1(y', t) = \dfrac{dy(x, z, t)}{dt} \\ F_2(z', t) = \dfrac{dz(x, y, t)}{dt} \\ F_3(x', t) = \dfrac{dx(y, z, t)}{dt} \end{cases} \tag{2}$$

where:

$F_1(y', t)$ - is the function of dependence between the economic component of development and the rate of change in y with respect to time;

$F_2(z', t)$ - is the function of dependence between the social component of development and the rate of change in z with respect to time;

$F_3(x', t)$ - is the function of dependence between the environmental component of development and the rate of change in x with respect to time;

$y(x, z, t)$ - is the function of the economic component of development with respect to the social component *z*, environmental component *x*, and time t;

$z(x, y, t)$ - is the function of the social component of development with respect to economic component *y*, environmental component *x*, and time *t*;

$x(y, z, t)$ - is the function of the environmental component of development with respect to the social component *z,* economic component *y,* and time *t*.

The right-hand side of the equation $df(t)/dt$ is the first-order derivative of *f(t)* with respect to time. The first-order derivative reflects the rate of change, that is, the change per unit of time. Hence, the process of small business development can be defined as a change over time in any of the three components of development with respect to other two components. The process of mathematical model specification of small business development consists of two steps. In step 1, indicators are selected that form a particular component of development. In step 2, the dependence between the selected indicators is found. The climate for business development can be assessed by looking at the operational performance of small firms. From this perspective, the indicators of economic development include the total profit and the gross output of small enterprises (both in absolute terms and per enterprise). Similarly, social development can be quantified with the help of indicators, such as social spending, social income, social effects, and social losses (in value terms). The value of tangible variables in the social component will change along with the economic indicators, and the value of intangible variables will show a decelerating logarithmic growth. The behaviour of economic, social, and environmental indicators can be estimated using a logistic function (da Costa Campos, 2019):

$$\frac{dy(t)}{dt} = \alpha \cdot \left[\frac{y_{max} - y(t)}{y_{max}} \cdot y(t)\right] \tag{3}$$

where:

$\frac{dy(t)}{dt}$ - represents the rate of change in y;

α - is the average annual rate of change in *y* on a per-unit basis;

y_{max} - is the maximum value of y recorded;

$y(t)$ - is the value of *y* for the selected value of t;

$\frac{y_{max}-y(t)}{y_{max}}$ - represents the impact of business environment that hinders the exponential growth of *y*.

The right side of the equation can be roughly divided into two parts. The first part α shows the contribution of one unit of something within the conditional frame of time $\Delta t = t_n - t_{n-1}$: for example, if *y* represents profit, then *α* will show the amount of additional profit a firm will obtain per dollar of revalue gained during the given time period *Δt*. The second part $\left[\frac{y_{max}-y(t)}{y_{max}} \cdot y(t)\right]$ reflects the value of *y* for the selected value of *t*with regard to the impact of the business environment. The expression $\frac{y_{max}-y(t)}{y_{max}}$ shows how much is left to reach the maximum value of *y*. To tailor the equation to the requirements of modelling, it is necessary to consider the influence of factors other than time on the selected indicators. For this, the right side of the equation was revised as follows:

$$\frac{\partial y(\underline{x}, t)}{dt} = \alpha \cdot \left[\frac{y_{max} - y(\underline{x}, t)}{y_{max}} \cdot y(\underline{x}, t)\right] + y(\underline{x}) \tag{4}$$

where $\underline{x}$ is the vector of a certain factor affecting y; and $y(\underline{x})$ is the function of dependence between y and $\underline{x}$.

The least complicated version of the function $y(\underline{x})$takes the form of a linear regression equation:

$$y(\underline{x}) = a_0 + a_1x_1 + a_2x_2 + \ldots + a_nx_n \tag{5}$$

where a_0 is the intercept; $a_1, a_2, \ldots a_n$ are regression coefficients for factors $x_1, x_2, \ldots x_n$.

The regression coefficient estimates the change in the indicator per unit increase in x_k. The upper bound of y_{max} shifts when adding more variables to the equation. However, the existence of a threshold value is not to be denied, since the growth of y_{max} will gradually slow down until constant when factors reach their critical value. This is due to the fact that the *x* variables also change along the logistic curve.

In this study, the factor affecting the social and environmental components of small business development is the economic component of development. The first two components, however, have little impact on the economic one, and here is why. Because the growth of the small businesses

sector is a recent event, the economic component of its development relies specifically on the time factor, that is, on the profit gained in previous years. Therefore, the system of differential equations for the economic, social, and environmental components of development will take the following form (6):

$$\begin{cases} \dfrac{dy(t)}{dt} = \alpha \cdot \left[\dfrac{y_{max} - y(t)}{y_{max}} \cdot y(t)\right] \\ \dfrac{\partial z(y,t)}{dt} = \beta \cdot \left[\dfrac{z_{max} - z(t)}{z_{max}} \cdot z(t)\right] + a_1 y(t) \\ \dfrac{\partial x(y,t)}{dt} = \gamma \cdot \left[\dfrac{x_{max} - x(t)}{x_{max}} \cdot x(t)\right] + a_2 y(t) \end{cases} \quad (6)$$

where:

$\frac{dy(t)}{dt}$ - is the rate of change in y;

$\frac{\partial z(y,t)}{dt}$ - is the rate of change in z;

$\frac{\partial x(y,t)}{dt}$ - is the rate of change in x;

$y_{max}, z_{max}, x_{max}$ - are the maximum values of economic, social, and environmental components, respectively;

$y(t), z(t), x(t)$ - are the values of economic, social, and environmental components with respect to time;

α, β, γ - are the average annual rates of change in $y, z, and\ x$ on a per-unit basis;

a_1 - is the regression coefficient (estimates the change in $z(t)$with resect to $y(t)$);

a_2 - is the regression coefficient (estimates the change in $x(t)$ with resect to $y(t)$); t is the selected value of time.

t - is the selected value of time.

The mathematical model of small business development uses three types of indicators: the economic (the total profit small enterprises make in the Far Eastern District), social (the average monthly salary of those employed at small enterprises in the Far Eastern District), and environmental (emissions from stationary sources per small enterprise). The average annual rate of change in these indicators was determined on the basis of the results of the regression analysis. It is found that the average annual rates of change in total profit are 0.32 million USD (α = 0.32), salary 0.13 USD (β = 0.13) and emissions 0.28 tonnes (γ = 0.28). The regression coefficient (a_1 = 169) indicates that a 1 million USD increase in profits generated by a small enterprise results in a 169 USD increase in salary. From data in Table 1, it is evident that the value of the determination coefficient of a linear regression model is relatively low.

Table 1. The results from the regression analysis of profit-salary relationships in small enterprises in the Far Eastern District

Regression model	Variable	Coefficient of determination
Linear	$z = 468.3 + 24.7y$	0.58
Logarithmic	$z = 218 + 169\ln(y)$	0.64
Exponential	$z = 512.4e^{0,034y}$	0.61

Source: own study.

Therefore, the right side of the equation estimating the rate of change in salary will be transformed into an expression with the highest coefficient of determination possible, that is, the logistic one:

$$\frac{\partial z(y,t)}{dt} = \beta \cdot \left[\frac{z_{max} - z(t)}{z_{max}} \cdot z(t)\right] + a_1 \ln(y(t)) \quad (7)$$

The input variables are depicted in Table 2. Given the absence of a close relationship between the variables of total profit and emissions, the part of the equation (6) with $a_2 y(t)$ was not used in modelling the growth of small business.

Table 2. Input data for modelling small business development across regions of the Far Eastern District

Variable	Designation	Value
The highest (maximum) profit, million USD	y_{max}	500
The highest (maximum) salary, USD	z_{max}	5000
The highest (maximum) level of emissions from stationary sources per small enterprise, tonnes	x_{max}	70
The average annual rate of change in profit, million USD per year	α	0.32
The average annual rate of change in salary, USD per year	β	0.13
The average annual rate of change in emissions from stationary sources per small enterprise, tonnes	γ	0.28
Regression coefficient, USD/million USD	α_1	169

Source: own study on the basis of their own calculations and data (Federal State Statistics Service, 2020a, 2020b, 2020c).

RESEARCH METHODOLOGY

The relationship between the number of small businesses and their turnover across regions in 2019 is depicted in Figure 1. As it can be seen, there are 125.7 thousand small enterprises operating in the Far Eastern District (Federal State Statistics Service, 2020), with the highest concentrations found in the Khabarovsk and Primorsky Krai.

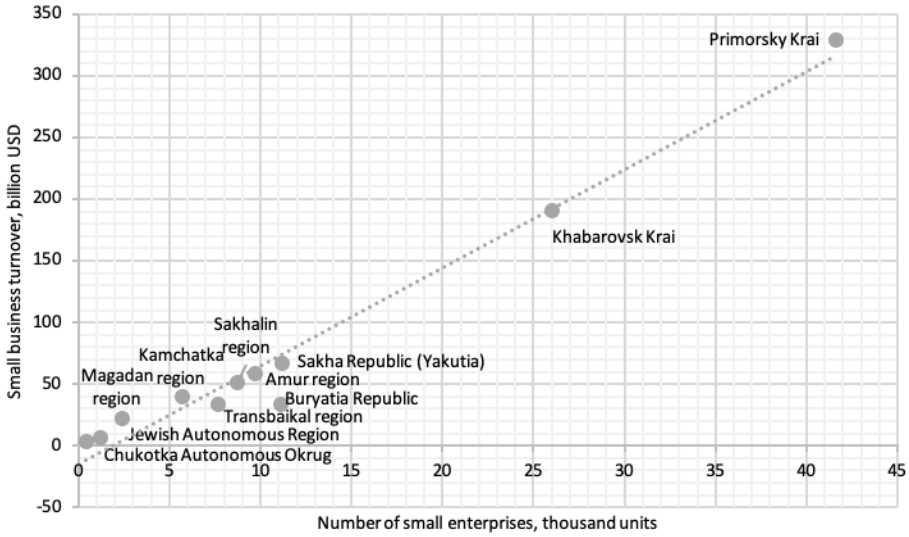

Figure 1. The relationship between the number of small businesses and their turnover across regions in the Far Eastern District as of 2019

Source: own study on the basis of data (Federal State Statistics Service, 2020a, 2020d).

The highest proportion of small businesses and the highest turnover were recorded in the Primorsky Krai, which makes it the region with the best small business statistics. The Khabarovsk Krai also has a substantial number of small firms and enterprises with sufficient turnover but it is far behind the Primorsky Krai. The smallest number of small businesses and the lowest turnover are attributable to the Chukotka Autonomous Okrug.

The analysis of the relationship between the average number of small business employees and the number of small enterprises per 10 000 population (Figure 2) indicates the absolute leadership of Khabarovsk and Primorsky Krai.

The smallest number of small businesses per 10 000 population was recorded in the Trans-Baikal and the smallest number of employees was found in the Chukotka Autonomous Okrug. This unevenness may be due to a range of factors. First, the regional growth of small business in the Far Eastern regions is hampered by the low density and unequal distribution of the population. The level of business activity was found to be more prominent in large urban agglomerations. Second, the Far Eastern District has a

large area, which determines the significant differences in the physical and climatic characteristics between regions. Northern regions such as Chukotka, Magadan, and Kamchatka have harsh climatic conditions, which make them unattractive for living and doing business. It should be noted that these regions also lack a sufficiently developed transport infrastructure. In regions where agriculture is on rise (the Jewish Autonomous Region and the Amur Region), small businesses are not common. Hence, the presence of natural resources is an equally important factor for the regional economic development.

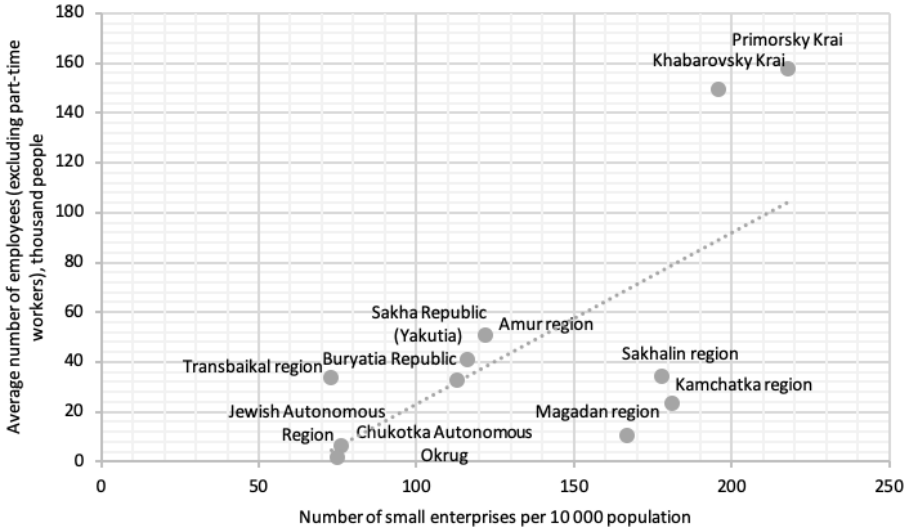

Figure 2. The relationship between the average number of small business employees and the number of small enterprises per 10 000 population across regions in the Far Eastern District as of 2019
Source: own study on the basis of data (Federal State Statistics Service, 2020a, 2020d).

The results of mathematical modelling suggest that it would take 4 years for small enterprises in the Far Eastern District to reach the maximum total profit possible without expanding the market (Figure 3).

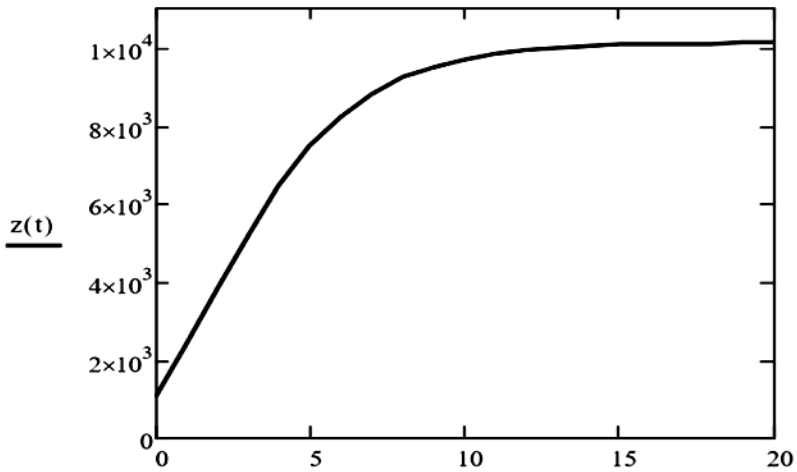

Figure 3. The changes over time in the economic component of small business development
Source: own study.

The Far Eastern District has a rather strong climatic and natural-resource potential. For instance, Sakhalin and Sakha Republic (Yakutia) can benefit a lot from mineral extraction. The standard of living in these regions is relatively high, which contributes positively to small business development. This determines the potential and scale of small business development and growth. Nevertheless, the regional growth rate of small businesses largely relies on the actions of the local government. The results of the study indicate that one of the major challenges for small businesses 3-4 years from now might

be the search for ways to increase their own profit past the limit. The solution might be innovation. As the profit grows, it would take 4 years to reach the maximum salary of 5 000 USD (Figure 4).

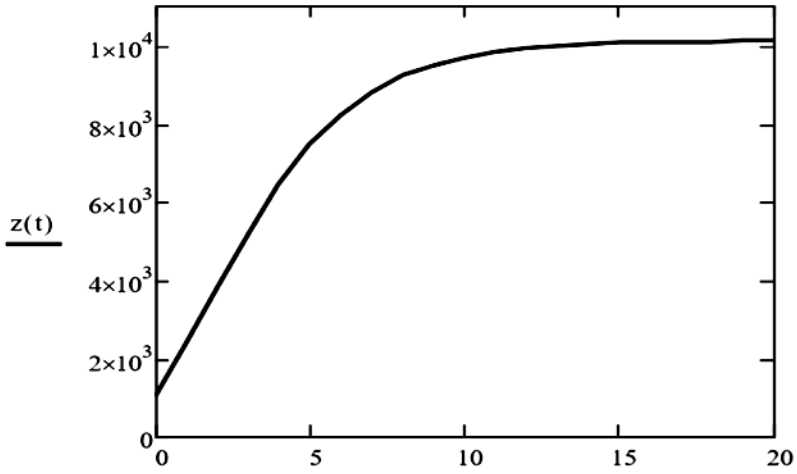

Figure 4. The changes over time in the social component of small business development
Source: own study.

In 2022, the salary increase may be up to 2 thousand USD per month, 1 thousand USD past the limit. The salary for small business employees is a figure that consists of salaries for both family and other employees. The above increase stems from profit growth.

It was also found that the volume of emissions per small enterprise is unlikely to reach its maximum value over the next 20 years (Figure 5).

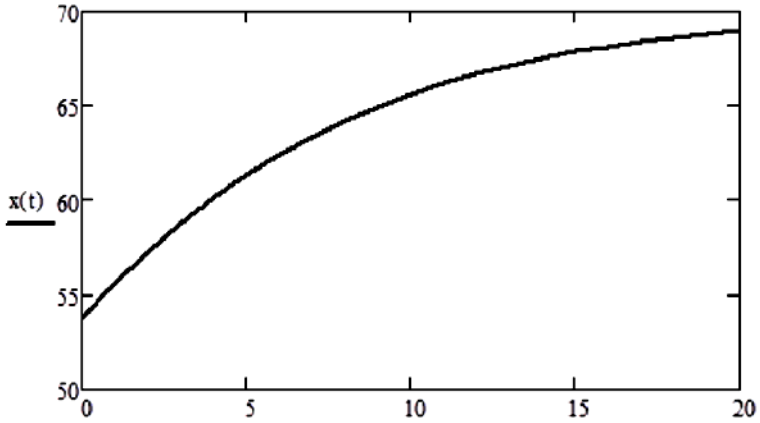

Figure 5. The changes over time in the environmental component of small business development
Source: own study.

Although the growth rates of emissions are relatively low, it is a problem to have them grow in the first place. Therefore, there is a need to introduce operational innovations to small businesses running in the Far Eastern District to prevent the negative environmental footprint from further growing. The development is a process of change, which in this study is addressed as the rate of change. Figure 6 shows that the salary growth rate may fall significantly during the first two years, and changes in the profit growth rate are likely to be much less significant.

At the same time, the higher the rate of increase in profits, the faster the salary will grow. One of the challenges for small businesses in the Far Eastern District is their economic underperformance. Profitability in this case is achievable through the mathematical model of logistic growth (equation 3). To estimate the lag of the regional small business behind the country-level alternatives, it is advisable to apply an approximation coefficient, which is defined as 1 minus a lag coefficient. The maximum

value of the approximation coefficient is $y_{max} = 1$. The change in the average annual rate is $\alpha = 0.17$ and the initial value of y_{max} is 0.4. The results from the modelling of profitability enhancement are depicted in Figure 7. As it can be seen, small enterprises operating in the Far Eastern District will be able to achieve the all-Russian level of economic development within the period of 17 years if nothing changes. Thus, a mechanism is needed to increase profitability of regional small enterprises and create conditions for their effective performance.

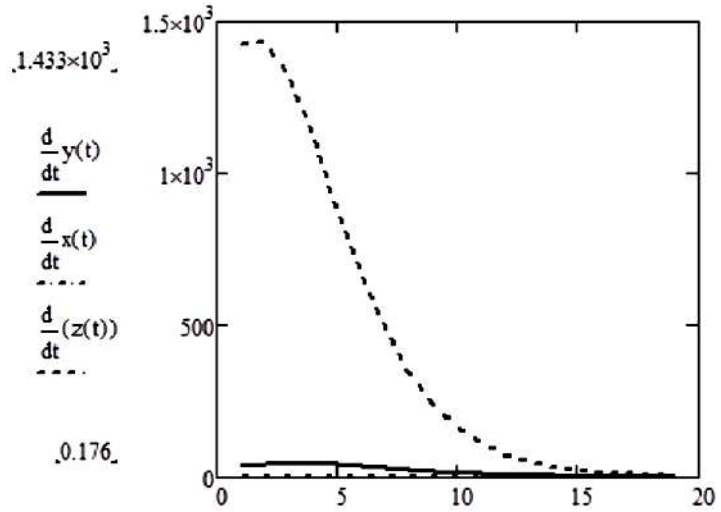

Figure 6. The rate of change in economic, social, and environmental variables
Source: own study.

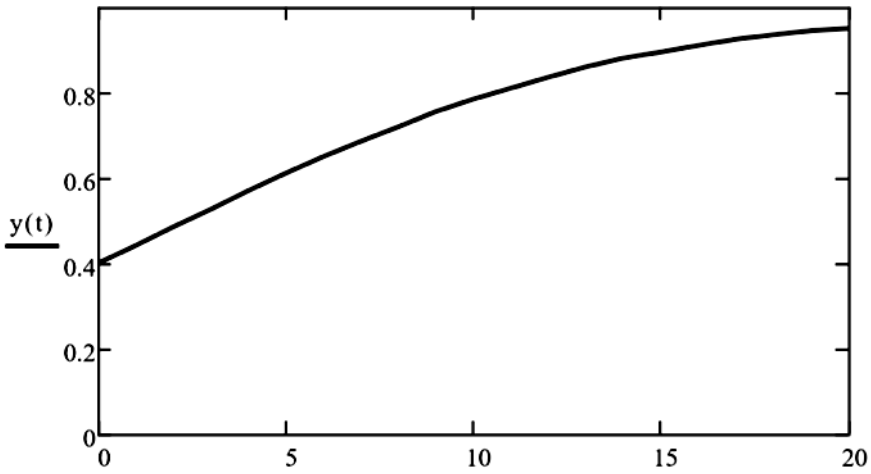

Figure 7. The changes over time in the value of profitability of small enterprises
Source: own study.

The study shows that the modelling of regional small business development should be based on the assumption that it is consistent with the basic principles for sustainable development. This assumes the rejection of hypothesis H1 and confirms the formed hypothesis H2 since the development of small businesses in Russian regions has to be integrated. At the same time, it is advisable to express the mathematical model as a system of differential equations reflecting the rate of change in indicators of economic, social, and environmental development.

The main advantage of the proposed methodological approach is that it conducts a joint assessment of the economic, social, and environmental components of small business development. The present research has a similar direction to the results of research by Dudin *et al.* (2019). They are also focused on the sustainable development of entrepreneurship, but they do not take into account the rate of change

in quantitative indicators, namely, their variation from one to another. Research by Salcedo-Perez and Contreras (2018) accumulates results on the change in business value for a circular economy, which also confirms the need for sustainable enterprise development. Asim *et al.* (2019) studied SMBs' sustainability and used regression analysis, but this was based on a survey of respondents.

Burrus *et al.* (2018) have results at the US county level that correlate the levels of innovation in regions and enterprise performance in those regions. The present study findings indicate that small businesses also need to focus on innovation and reinvestment in innovation to improve competitiveness; this complies with the study by Hughes *et al.* (2020). However, the proposed model is notable for its versatility, allowing one to evaluate changes in any indicator. The research results show that while maintaining the current level of development of the productive forces, profit growth will be significantly limited.

Garrigós Simón *et al.* (2017) emphasized encouraging social entrepreneurship by a state to improve a population's welfare. However, one cannot fully agree with this, since the source of social development of business should be a small business, which forms the basis for social security of a state. However, the proposed model can help small business owners determine how to achieve growth (Li *et al.*, 2020). Future studies can measure levels of sustainable development across the regions surveyed by Neumeyer and Santos (2018). The range of indicators of environmental development can be expanded in several directions to include environmental spending (expenditures for environmental protection, public health, etc.), environmental income (monetary benefits of environmental activities for a population), environmental effect (environmental income minus environmental spending), and environmental losses (expenditures due to pollution). This comprehensive approach is supported by a study by Buffa *et al.* (2018).

Individual components are highly dependent on timing and other components. In this context, the results of the present study are similar to Johnstone (2020), as indicators can have either a stimulating or a constraining effect on small business growth. On the other hand, there are environmental indicators that tend to decrease, and the rate of their change is slowing down. However, research by Rekik and Bergeron (2017) indicates that, in practice, such rates tend to rise up to the government-set limit.

The proposed approach to estimating small business development allows to identify areas of regional policy that need adjustment (Pichler, 2018). In addition, it indirectly allows for a comparative performance analysis of public authorities across regions. This contributes to a holistic vision of how a state policy for regional development should be designed with respect to the potential of a region for which it will be designed.

CONCLUSIONS

The results of the study show that large urban agglomerations, such as Khabarovsk and Primorsky Krai, have a stronger small business landscape when compared to other regions. The least strong small business landscape emerged in the Trans-Baikal region and the Chukotka Autonomous Okrug due to the low density and unequal distribution of the population in those territories. Northern regions such as Chukotka, Magadan, and Kamchatka were found to be unattractive for doing business due to harsh climatic conditions.

Despite the important role of the economic component for the functioning of small businesses, Russian regions must develop in an integrated manner. The higher the growth rate of profit, the faster the growth rate of salary. The results of modelling suggest that small businesses in the Far Eastern District will not be able to enhance their profitability and offer larger salaries by 2024. While the growth rate of salary is expected to decrease significantly during the first two years, changes in the profit growth rate will be much less significant. Hence, one of the major challenges is the search for ways to increase profitability. This can be done through innovation. Emissions from stationary sources per small enterprise will continue to grow during the next 20 years. In current market conditions, it will take 17 years for small enterprises in the Far Eastern District to reach the all-Russian level of economic development. Thus, a mechanism is needed to increase profitability of regional small enterprises and create conditions for their effective performance.

The limitation of the study is that the change in each component is due to both the time and changes in other components of development. Future studies will benefit from expanding the range of indicators for the model and from looking at other regions and countries. They also may estimate the overall business sector. The results of this study may be useful in determining business policy directions, appropriate mechanisms, and parameters to ensure effective business development at the local, regional, and global levels.

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The contribution of co-authors is equal and can be expressed as 25% for each of the authors: V. Mutalimov prepared the concepts, I. Kovaleva prepared the literature review, A. Mikhaylov prepared the methodology, while D. Stepanova prepared the survey.

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Acknowledgements and Financial Disclosure

The authors received no financial support for the research, authorship, and/or publication of this article.

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Published by Cracow University of Economics – Krakow, Poland