Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics

Diploma Thesis

The effect of government support measures on the Russian economy

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Faculty of Economics and Management

DIPLOMA THESIS ASSIGNMENT

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Economics Policy and Administration

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The effect of government support measures on the Russian economy

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Objectives of thesis

Since 1991 the Russian economy has undergone a number of significant turmoil: devaluation of Ruble in 1998, the world financial crisis in 2008, a long preparatory process of entering the WTO in 2012, sanctions associated with the Crimea events in 2014, and pandemic shock in 2019. In this regard Russian government has pursued a prudent macroeconomic policy aimed at maintaining financial stability, and the central bank has carefully controlled inflation. In this light it becomes interesting to investigate whether the undertaken by the government measures were effective or not. The main aim of the submitted Diploma thesis is to investigate the impact of government support measures for business on economic development/growth in the Russian Federation. To achieve the formulated main goal the following partial research questions are set out and will be gradually answered:
1. What distinguishes economic development from economic growth?
2. Which indicators are used to measure economic development/growth?
3. How government can support business (economically, financially, legally etc.)?
4. What does tax holiday stand for?
5. What programs were launched in Russia over the analyzed period to support business?
6. Is there a statistically significant link between government support for business and economic development/growth in Russia?

Methodology

The theoretical part of the Diploma thesis will be based on a relevant literature review (represented by printed literature, scientific articles, surveys, web sources) and the research of similar studies, using methods such as abstraction, inductive reasoning, analysis, synthesis, and deduction.

The practical part will contain descriptive statistical analysis and qualitative thematic synthesis of the main macroeconomic indicators and selected for the analysis variables. Own research work will be mainly based on time series analysis with the use of LRM and OLSM (or alternatively Vector Error Correction Model and cointegration techniques).

The results of the conducted analysis will be discussed and complemented with the author's recommendations.

The proposed extent of the thesis

60-80 pages

Keywords

Russia, Government support, Economic growth, Economic development, VECM, cointegration

Recommended information sources

DALGAARD, P. *Introductory statistics with R.* New York: Springer, 2008. ISBN 978-0-387-79053-4.
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Prague on 30. 03. 2022

Declaration

I declare that I have worked on my master's thesis titled " The impact of state support measures on the Russian economy" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the master's thesis, I declare that the thesis does not break any copyrights.

In Prague on 30.03.2022 _____

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The effect of government support measures on the Russian economy

Abstract

The economies of a large number of countries depend on entrepreneurship. The importance of this thesis is due to the fact that entrepreneurship plays an important role in the economic growth and development of countries around the world. Business creates and sells various goods and services, provides people with jobs, creates technologies and innovations, being the engine of progress in the modern world.

In this thesis, various tools were considered with the help of which states (in particular the Russian Federation) can stimulate business development within their country. Through statistical analysis, we examined the dynamics of changes in general economic indicators, indicators of agriculture and the technology and innovation sector in Russia. By means of econometric analysis using ordinary least squares model, vector autoregression model and vector error correction model, the existence of a link between government measures to support business entities and the economy of the Russian Federation was revealed. The data for the analysis were collected from various open data sources.

Keywords: Russia, Government support, Business, Economic growth, Economic development, VECM, OLS, VAR, cointegration

Vliv vládních podpůrných opatření na ruskou ekonomiku

Abstrakt

Hospodářství velkého počtu zemí závisí na podnikání. Význam této práce souvisí s tím, že podnikání hraje důležitou roli v hospodářském růstu a rozvoji zemí po celém světě. Podnikání vytváří a prodává různé zboží a služby, poskytuje lidem práci, vytváří technologie a inovace a je motorem pokroku v moderním světě.

V této diplomové práci byly zvažovány různé nástroje, pomocí kterých mohou státy (v tomto případě Ruská Federace) stimulovat rozvoj podnikání v rámci své země. Prostřednictvím statistické analýzy byla prozkoumána dynamika změn obecných ekonomických ukazatelů, ukazatelů zemědělství, technologického a inovačního sektoru v Rusku. Pomocí ekonometrické analýzy a také běžného modelu nejmenších čtverců, vektorového autoregresního modelu a modelu korekce vektorových chyb byla odhalena existence vazby mezi vládními opatřeními na podporu podnikatelských subjektů a ekonomikou Ruské Federace. Data pro analýzu byla shromážděna z různých otevřených zdrojích dat.

Klíčová slova: Rusko, vládní podpora, podnikání, hospodářský růst, hospodářský rozvoj, VECM, OLS, VAR, kointegrace

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List of abbreviations

ADF test – Augmented Dickey-Fuller

ADL – Autoregressive Distributed Lag

bln – billion

GDP – Gross Domestic Product

OKVED – All-Russian classification of types of economic activity (Общероссийский классификатор видов экономической деятельности)

OLS(M) – Ordinary Least Squares Model

RUR – Russian Ruble

SME – small and medium-sized business entities

trln – trillion

US – United States

USSR – Union of Soviet Socialist Republics

VAR model – Vector Autoregression Model

VAT – Value Added Tax

VECM – Vector Error Correction Model

WTO – The World Trade Organization

1. Introduction

Sustainable economic growth and economic development depends on many factors, one of which is the development of the business sector. The economy of any modern state cannot develop properly without a competent combination of large, medium, and small enterprises. Due to mobility, flexibility and an innovative approach, small and medium-sized businesses are able to quickly adapt to changes in consumer demand, quickly develop a new product or service and establish production in a shorter time than large enterprises.

The development of entrepreneurship allows not only to increase the size of GDP and improve the level and quality of life of the population, it also contributes to the development of a healthy competitive environment and increases the influence of a country on the world stage.

In this regard, the most developed countries in the world provide support to small and medium-sized businesses, since it is small and medium-sized businesses that are the engine of progress due to the fact that small enterprises respond faster to changing needs. For example, in the countries of the European Union, there are a number of measures aimed at supporting and continuously developing business. The European Union member States have a well-developed network of organizations for business regulation and development. Countries remove administrative barriers, allocate funds, provide equipment and materials, and provide non-material assistance (for example, training and legal assistance).

Business began to develop on the territory of the Russian Federation only at the end of the 20th century after the collapse of the USSR. In modern Russia, steps have been taken towards democratic transformations and the formation of market relations. We can say that millions of Russian citizens are engaged in entrepreneurial activities, making a socio-economic contribution to the development of the country. However, if we consider the current business opportunities, the share of the entrepreneurial sector in strengthening the market economy is clearly insufficient. The development of entrepreneurship in the regions of the Russian Federation faces numerous problems that are mostly typical: high administrative barriers and imperfect legislative framework, the amount of taxes and fees, lack of financial resources and legal illiteracy of business. The authorities are gradually removing restrictions for business development, developing new legislative acts and state programs.

In my opinion, this study is quite important, because it will allow us to determine the difference between economic growth and economic development, to identify the relationship between business and the economy, to determine the advantages and disadvantages of various

types of support for small and medium-sized businesses introduced on the territory of the Russian Federation and to analyse the overall impact of existing measures on the country's economy.

2. Objectives and Methodology

2.1. Objectives of thesis

Since 1991 the Russian economy has undergone a number of significant turmoil: devaluation of Ruble in 1998, the world financial crisis in 2008, a long preparatory process of entering the WTO in 2012, sanctions associated with the Crimea events in 2014, and pandemic shock in 2019. In this regard Russian government has pursued a prudent macroeconomic policy aimed at maintaining financial stability, and the central bank has carefully controlled inflation. In this light it becomes interesting to investigate whether the undertaken by the government measures were effective or not. The main aim of the submitted Diploma thesis is to investigate the impact of government support measures for business on economic development/growth in the Russian Federation. To achieve the formulated main goal the following partial research questions are set out and will be gradually answered:

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2.2. Methodology

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The results of the conducted analysis will be discussed and complemented with the author's recommendations.

3. Literature Review

3.1. Economic development and economic growth

In this part, definitions will be given, the nature and main differences between economic growth and economic development will be revealed.

3.1.1. The concept, role and differences between economic growth and economic development

Economic development – improvement of economic growth indicators, as well as structural and qualitative changes in the economy, culture, education, improvement of the living conditions of the population and the quality of life (Ivic, 2015).

Economic development creates conditions for the stability of the national economic system, as well as provides a foundation for systematic economic growth. At the same time, each state creates its own unique economic structure, which is formed under the influence of historical, political, and social factors. However, despite certain peculiarities, most countries have a lot in common in their economic structures. The main condition for economic development is the effective distribution of material goods. Economic growth contributes to an increase in the final performance indicators, but development makes qualitative changes in the country's economy (National Institute of Open Schooling, no date).

Currently, great emphasis is placed on the social sphere of society, so the activities related to the national economy are not only economic, but also social in nature. For this reason, the tasks of economic development are associated with measures aimed at increasing the level of income of citizens, improving the quality of healthcare, and improving the demographic situation. In addition, the state needs to provide a comfortable environment for a person's life, in which he will be able to dispose of his social and economic freedoms. This approach will give an incentive for the comprehensive development of the individual, who plays an important role in the formation of the national economy. It is worth noting that the development of the economy is an unstable process, which, like any other systemic changes, goes through the stages of growth and decline. Therefore, at different time stages, there may be different trends in the formation of the economic system. Economic growth is usually understood as an increase in the output of goods and services and/or an increase in the cost of goods and services produced in a particular economic entity. This is an increase in the volume of the economy, which can be tracked using macro indicators.

Economic growth is the process of increasing the volume of material goods, improving their quality in accordance with the structure of increasing and changing needs. Economic growth is reflected not only in an increase in the volume of output of goods and services, but also in improving the quality of products/services.

The nature of economic growth consists in resolving and reproducing at a new level the main contradiction of economy: between the limited production resources and the boundlessness of social needs. The contradiction of economy is solved in two different ways:

– the most efficient use of production capabilities and available resources

– development and increase of production capabilities.

A growing economy has a greater ability to meet new needs and solve socio-economic problems both domestically and internationally.

Considering economic growth from the point of view of the interests of the whole society, we can distinguish its two main goals: improving the material well-being of the population and maintaining national security. These goals are reflected in increasing the level of the average per capita income of the population, increasing the variety of goods and services, improving their quality and quantity.

Thus, I can conclude that economic growth and economic development are closely related to each other, but they can exist separately from each other, since they are aimed at different spheres and are recognized to evaluate different aspects of the economy. Economic growth determines quantitative changes in the economy, since the growth of the volume of goods and services produced, exports and imports of products, while economic development precisely considers the qualitative component. Economic development poses the question of the goals of economic growth from the position of the government and society.

3.1.2. Indicators of economic growth and economic development

The main indicators that determine economic development are:

1) Gross domestic product per capita is a special macroeconomic indicator that characterizes the state of a country's economy in relation to the number of its citizens. The total GDP is not suitable for assessing the state of the economy since this indicator only reflects the total value of all goods and services produced in the country.

2) Per capita income – an indicator of the economic well-being of a country, which is calculated as the average income received by one person for a certain time interval (more often for one year)

3) Consumption per capita is an indicator that characterizes the annual use of goods and services by each person. The calculation is made by dividing the total amount of goods and services consumed by the population of the country. This indicator reflects the level of economic well-being (K.J. Ravi, 2016).

4) Human development index – an indicator that is calculated annually to compare and measure the standard of living, education, literacy, and life expectancy in different countries

5) The level and quality of life of the population (life expectancy, morbidity, education, social security, etc.)

6) Industrial progress

7) Investments

8) and others

The main indicators that determine economic growth:

1) Gross domestic product is a macroeconomic indicator that reflects the market value of all final products (goods and services) produced over a certain period of time (usually a year) on the territory of a particular country, regardless of the nationality of the factors of production used (goods and services produced by non-residents of the country are also taken into account). This indicator is expressed in the national currency, foreign currency (usually US dollars), or is represented by purchasing power parity (Eurostat, no date).

2) Gross national product is one of the main macroeconomic indicators. Unlike gross domestic product, gross national income does not take into account the total value of all goods and services produced, but the total value of all goods that were produced only by residents of the country, regardless of their geographical location. In other words, the gross national income of the Russian Federation, for example, takes into account the volume of goods and services produced in another country if the company is owned by a resident of Russia. Gross domestic product per capita

3) The level of inflation – an indicator that reflects the growth of the overall level of prices for goods and services. To determine the level of inflation, the standard consumer basket is mainly taken and changes in its total value are tracked in relation to the previous period.

4) The level of employment, unemployment. The unemployment rate is one of the key indicators that characterize the labour market and the economy of the country as a whole. The causes of unemployment can be various factors, for example, lack of jobs,

seasonality of work, changes in consumer demand for certain goods and services, which leads to the elimination of jobs, the general decline in the economy and production, as well as the human factor, for example, when the employer's requirements for candidates are too high.

5)   Labour productivity

6)   Liquidity indicators

7)   and others

3.2. Business in the Russian Federation

3.2.1. Formation of business in Russia

Small and medium-sized businesses in developed countries are the key engine of economic development and economic growth. Small and medium-sized businesses make a significant contribution to the gross domestic product of states, provide a huge number of jobs for the population (The World Bank, n.d.). Business provides the needs of the population in various goods and services, including socially significant ones.

Private entrepreneurship in the Russian Federation is a fairly young phenomenon. The business has been developing for three decades. The formation of private entrepreneurship in modern Russia is quite difficult for a number of reasons, which are mainly historical and political in nature.

First of all, the contribution was made by the old economic system of the predecessor of modern Russia – the Soviet Union, in which there was a planned economy focused on large-scale production, large enterprises and full state control over production, there was no private enterprise on the territory of the Soviet Union.

Secondly, in the territory of modern Russia, the extractive industry prevails in the gross domestic product. These are large enterprises that extract minerals, such as oil, gas, coal, metals, and so on. In the share of gross domestic product over the past twenty years, the share of the extractive industry is more than 50 percent of the total volume (Stolypin P.A. Institute of Growth Economics, 2021).

The third reason is the lack of experience in the management and development of small and medium-sized businesses due to the recent transition from a planned economy and a market economy. The state and its population do not have enough knowledge and experience in this area, which significantly slows down economic growth in modern Russia.

In addition to these reasons, some authors believe that the low rates of development of small and medium-sized businesses in Russia are associated with the so-called "resource curse", that is, the total orientation of the country's economy on the extraction and sale of minerals, while other sectors of the economy, such as manufacturing, engineering, technology, agriculture, and others are stagnating or are degrading, yielding to resource companies (Naumkin, 2016).

Nevertheless, the state is aware of the importance of small and medium-sized enterprises, issues regulatory legal acts and state programs covering both the whole business as a whole and its individual spheres of activity.

3.2.2. Classification of business entities

The following business entities are established at the legislative level in the Russian Federation (State Council of the Russian Federation, 2007):

1. Self-employed citizens
2. Individual entrepreneurs
3. Microenterprises
4. Small businesses
5. Medium-sized businesses
6. Large enterprises

Citizens of the Russian Federation and foreign citizens of the member states of the Eurasian Economic Union who receive monetary remuneration from customers for the work they have done, or services performed can be considered self-employed. The concept of "self-employment" appeared in Russia quite recently – in 2017, initially it was a pilot project of the state, for which, among other things, a separate tax was developed – a tax on professional income, which is 4% for individuals and 6% for individual entrepreneurs (State Council of the Russian Federation, 2018). At the moment, 84 constituent entities of the Russian Federation can register as a self-employed citizen. The self-employed include two categories of citizens of the Russian Federation:

1. individuals who work for themselves, providing paid services, performing work, or selling any goods, as well as people who rent movable or immovable property belonging to them

2. individual entrepreneurs who conduct their business activities without employees working under an employment contract.

Individual entrepreneurs are individuals registered in accordance with the established procedure, who carry out their business activities without forming a legal entity. Citizens of the

Russian Federation who have reached the age of 18 have the right to register as an individual entrepreneur (State Council of the Russian Federation, 2001). Individual entrepreneurs have the right to independently choose a suitable taxation system for them. In accordance with the Tax Code of the Russian Federation, these systems include the general taxation system, the simplified taxation system, the taxation regime in the form of a single tax and the taxation system for agricultural producers.

The activities of individual entrepreneurs are limited, therefore, some activities that require special permits and licenses cannot be the activities of individual entrepreneurs. Also, in accordance with Russian legislation, an individual entrepreneur in the event of his insolvency (bankruptcy) is responsible to the state with his property (real estate, bank accounts, etc.), unlike legal entities.

Microenterprises include small business entities (individual entrepreneurs and enterprises with no more than 15 employees), (State Council of the Russian Federation, 2007). At the same time, the volume of annual revenue received from the sale of goods or the provision of services (performance of works) before taxes, microenterprises should not exceed one hundred and twenty million rubles. Also, for microenterprises, there is a limit on the share of participation in the main capital of charitable and public organizations – no more than 25% of the authorized capital, for foreign organizations – no more than 49% of the authorized capital of a microenterprise. Microenterprises are part of the structure of small business in the Russian Federation (Federal State Statistic Service of the Russian Federation, 2021).

Small enterprises differ from microenterprises in only two parameters: annual revenue and the number of employees. So, for a small enterprise, the number of employees with whom the enterprise has concluded an employment contract should not exceed 100 people, and the annual revenue received from the sale of goods, performance of works or provision of services should not exceed eight hundred million rubles. The legal requirements for the structure of the authorized capital of a small enterprise are the same as those of microenterprises, that is, at least 51% of the authorized capital should belong to individuals or small and medium-sized businesses, and the share of the state or non-profit organizations should not exceed 25% of the authorized capital.

Medium-sized enterprises include enterprises whose average number of employees is:

1. from 101 to 250 people inclusive, if the activities of such enterprises do not relate to certain types of entrepreneurial activity for which a different limit value of the average number of employees of the enterprise is established

2. from 101 to 1000 people – the average number of employees of medium-sized enterprises, the main type of entrepreneurial activity of which is activity in the field of light industry

3. from 101 to 1500 people if the enterprise carries out its business activities in the following areas: activities for the provision of food and beverages, activities of hotels and catering establishments.

The maximum income for the previous calendar year for medium-sized enterprises should not exceed the amount of two billion rubles. Income is determined according to tax accounting data by adding up the income received for all types of activities carried out by the organization (Glavkniga, n.d.).

Large enterprises in the Russian Federation are considered to be enterprises with an average number of employees exceeding 250 people, and the volume of revenue excluding value added tax exceeds two billion rubles.

3.3. Government support for small and medium-sized businesses

In this part, existing business support measures will be considered, as well as business support measures applied on the territory of the Russian Federation and regulatory legal acts regulating business in Russia will be considered.

3.3.1. How can government support business?

Over the history of government participation in the form of providing various support measures aimed at sustaining and developing business, the following variants of government support measures have been formed (Figure 1):

Figure 1. Government measures to support business
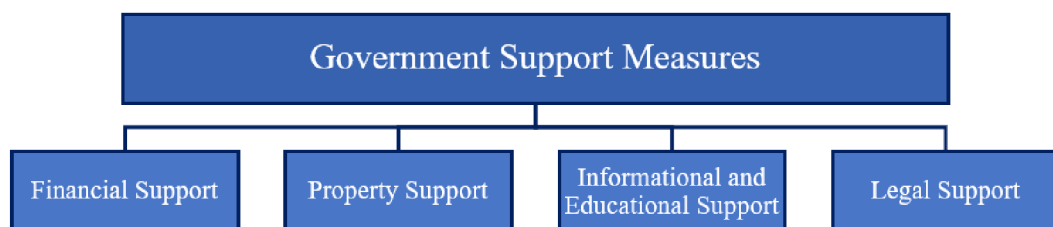
Source: Own elaboration based on data retrieved from the (Levchenko K., Epanchicev B., 2018)

Let's take a closer look at the different types and forms of government support for business:

1) Financial measures to support business:

- subsidizing on an irrevocable basis
- provision of grants and state guarantees
- provision of loans on preferential terms and provision of non-refundable loans
- provision of preferential conditions for taxes, insurance premiums, duties
- attracting investment.

2) Property support measures is a transfer of ownership or leasing of land plots, buildings, structures, premises, vehicles, equipment, tools, and other property on a paid, free of charge basis or on preferential terms (Levchenko K., Epanchicev B., 2018).

3) Informational and educational support:

- conducting lectures, trainings, and seminars for mastering the basics of doing business, organizing processes, mastering legislative norms regulating entrepreneurial activity, and so on
- training of the organization's personnel through training programs
- assistance in the development of business plans and strategies, marketing support
- organization of mass events to increase the awareness of a product or service (conferences, exhibitions, fairs, online events)

4) Legal support

- development, implementation, and control of the implementation of regulatory legal acts on business support and development. Such legal acts may include federal laws, laws of subjects, government resolutions, decrees, orders, instructions, and so on.
- providing legal assistance to business (development of standard documents, legal consultation, presentation of business interests in court and other state institutions).

3.3.2. Government support measures for business in Russian Federation

Since the fall of the Soviet Union, during the country's transition to a market economy, various acts, measures, and structures aimed at the development of entrepreneurship in the country began to form in Russia.

State support for entrepreneurship in the Russian Federation is part of the socio-economic policy and represents a set of political, legal, financial, informational, public, consulting, and educational activities.

Currently, the system of measures of state support for business in Russia includes the following tools:

1.   Regulatory and legal regulation of entrepreneurship. Regulatory and legal regulation includes all regulatory and legal acts aimed at protecting, regulating, stimulating and supporting small and medium-sized businesses. Such acts include constitutional and federal laws, laws of subjects, normative legal acts of municipalities, as well as decrees, resolutions and orders. For example, such documents include the Constitution of the Russian Federation, the Civil Code, the Tax Code, the Code of Administrative Offenses, the Federal Law "On Protection of Competition", the Federal Law "On the Development of Small and Medium-sized Businesses in the Russian Federation", the Decree of the Government of Moscow dated 01.07.2013 No. 424-PP and many other documents. The normative acts are designed not only to establish a clear business procedure and define borders, but also to determine the main directions and ways of supporting small and medium-sized businesses in the territory of the country, subject, city, or district.

2.   Property and financial support. The state allocates land plots, premises, buildings, equipment, finances business through subsidies, grants, participates in the provision of loans on preferential terms, acting as a guarantor in banks. In addition, in Russia there are various funds to which legal entities can apply for financial assistance, and organizations, including public ones, that are designed to protect the interests of business.

3.   Information and consulting, legal and educational support. At the moment, several online services have been developed in Russia, with the help of which legal entities and individuals who are just planning to open their own business can familiarize themselves with regulatory acts, pass webinars and trainings on topics of interest to them, apply for a subsidy, grant or preferential loan, consult a lawyer and select personnel to work at their enterprise (My Business Russia, n.d.).

4.   Creation and implementation of a system of interregional cooperation, support for foreign economic activity

5.   Creation of special preferential lending regimes for small and medium-sized businesses, special tax regimes. In Russia, there are special tax regimes for young enterprises, farms, a simplified tax system and a patent tax system. In the next section, we will discuss in more detail such a way of supporting business as tax holidays (Federal Corporation for the Development of Small and Medium-Sized Enterprises, n.d.).

6.   Reduction of requirements for document management and reporting at enterprises, reduction of the number of inspections carried out by tax authorities and other control and supervisory agencies.

Separately, it is worth considering national and federal projects, state programs and programs of subjects that contribute to the development of small and medium-sized businesses. At the moment, more than nine major programs and projects have been developed and implemented at the federal level in Russia aimed at increasing the attractiveness of entrepreneurial activity, material, consulting, educational, legal and other types of support for small and medium-sized businesses. Let us take a closer look at each of them:

1.   The National Project "Small and medium-sized entrepreneurship and support for individual entrepreneurial initiative". This project was created in 2018. It is aimed at the comprehensive development, support, and stimulation of business in the Russian Federation. The structure of the national project includes four federal projects aimed at creating conditions for an easy start and comfortable business, creating conditions for the self-employed, accelerating small and medium-sized businesses and creating a digital platform and services to simplify obtaining targeted support measures. The national project offers various measures to support business at any stage. Such measures include financial (grants, subsidies, benefits, loans with state support, etc.), property (provision of land, premises, equipment, etc.), educational (for example, conducting various trainings on business management, recruitment, marketing solutions) (Ministry of Economic Development of the Russian Federation, n.d.).

2.   The Federal Project "Support for the self-employed". The main activities of this project, created within the framework of the national project "Small and medium-sized entrepreneurship and support for entrepreneurial initiative", are the provision of microloans at a preferential rate, the provision of office and production space for rent, the provision of information and consulting, educational services, the provision of preferential access to electronic trading platforms and financial support for the self-employed. In accordance with this program, the self-employed also receives a preferential rate for income taxes. (Ministry of Economic Development of the Russian Federation, n.d.)

3.   The Federal Project "Creating conditions for an easy start and comfortable business" was created for individuals who are just planning to open their own business and for young organizations (registered for less than one year). The project includes the reduction and simplification of accounting and reporting, a preferential tax system, the provision of financial assistance, including loans and microloans on preferential terms, the

provision of premises and equipment for rent on preferential terms (Ministry of Economic Development of the Russian Federation, n.d.).

4.   The Federal Project "Acceleration of small and medium-sized businesses" is aimed at existing businesses. The main activities of this project are the introduction of a transitional tax regime in order to smoothly change the tax burden on enterprises, the provision of subsidies and grants, the provision of comprehensive support for enterprises (consulting, financial, educational), the creation of conditions for business participation in complex purchases, including state purchases, support for the issuance of securities, the reduction of administrative barriers to export. (Ministry of Economic Development of the Russian Federation, n.d.)

5.   The Federal Project "Creation of a digital platform with a mechanism for targeted selection and the possibility of remote receipt of support measures and special services by SMEs and self-employed citizens". As the name of the federal project implies, the basis is digitalization, simplification of access and receipt of support measures for small and medium-sized businesses, as well as self-employed citizens, through the development of platforms and services for electronic remote provision of various services. In addition to the measures described above, in accordance with the goals of the federal project, organizations will be able to use remote platforms to recruit personnel (Mistry of Economic Development of the Russian Federation, n.d.).

6.   Federal programs of the Russian Federation to support and stimulate the development of small and medium-sized businesses

6.1.   The State Program for the development of agriculture and regulation of markets for agricultural products, raw materials, and food. The program was approved in 2012 for the period from 2012, at the moment the terms of implementation of the program have been extended until 2025. The purpose of the program is to develop the agricultural sector, increase the production of crop and livestock products, increase exports, increase the number of organizations engaged in agriculture. In accordance with the passport of the program, individual entrepreneurs and small and medium-sized businesses can apply for grants, subsidies, preferential lending programs for development in the field of agriculture. The state can also provide farmers with land plots and equipment on preferential lease terms (Government of the Russian Federation, 2012).

6.2.   The State Program "Economic development and innovative economy". This state program was implemented in the period from 2013 to 2020 with

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funding in the amount of 906,534,155,000 rubles. The section of expected results from the implementation of the program includes: an increase in the share of employees employed in small, small and medium-sized enterprises, as well as an increase in the number of individual entrepreneurs, improving business conditions and reducing administrative barriers, including reducing investment and business risks, increasing guarantees for the protection of the rights of legal entities and individual entrepreneurs. Within the framework of this program, a Direct Investment Fund was created, "roadmaps" were developed to optimize and simplify business registration procedures, facilitate access of small and medium-sized businesses to procurement of companies with state participation, measures were taken to improve customs regulation (Government of the Russian Federation, Ministry of Economic Development of the Russian Federation, 2012)

7.   Programs of subjects and cities of federal significance (Moscow, St. Petersburg, Sevastopol). These programs are aimed at the development of small and medium-sized businesses directly on the territory of the republics, regions, and cities of federal significance. They are subordinate to national projects, federal projects and federal state programs and subprograms. The subjects independently distribute the funds allocated from the federal budget for the development of small and medium-sized businesses in strategically important sectors of the economy.

3.3.3. Tax systems for business in Russia

At the moment, there are several systems (taxation regimes) for business entities in the Russian Federation (Figure 2).

Figure 2. Taxation regimes for businesses in Russia
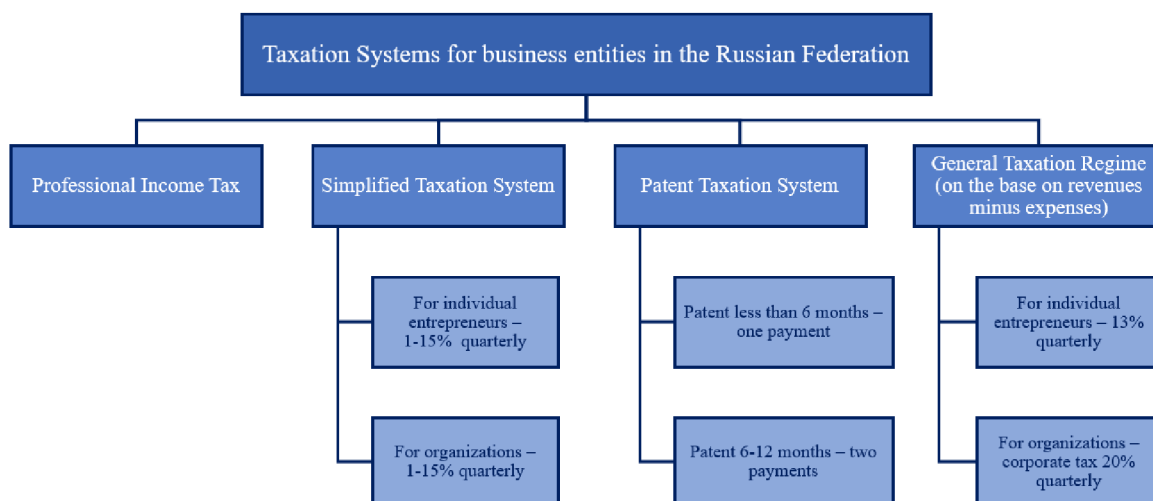
Source: Own elaboration based on data retrieved from the Federal Tax Code of the Russian Federation (parts 1, 2) (State Council of the Russian Federation, 1998); (State Council of the Russian Federation, 2000)

The Tax Code provides entrepreneurs with the opportunity to independently choose the most suitable taxation system for them. Let us take a closer look at these systems (Federal Tax Service of the Russian Federation, n.d.):

1.   Simplified taxation system. The peculiarity of the system is that reporting to the tax authorities is provided with a frequency of once a year, and also when using this system, less documentation is required from the entrepreneur compared to the general taxation system. The simplified taxation system has two types of tax charges – it is the interest rate on the income of the enterprise or the interest rate on the income minus the expenses of the company. When applying different options, the amount of tax payments will also vary. A simplified taxation system based on the "Income minus expenses" system will be more beneficial to those companies whose expenses amount to at least sixty percent of their income. The options differ in the size of the interest rate – for the system of calculating taxes on the income of an enterprise, a tax rate of six percent is valid (in some cases, the subjects of the Russian Federation have the right to set a rate below six percent, but not less than one percent of the company's income), for the "Income minus expenses" calculation system, a tax rate of fifteen percent is used, similarly with the first option, the subjects of the Russian Federation also have the right to set a reduced interest rate for enterprises up to five percent. The simplified taxation system also has a number of restrictions, so it is not suitable for all business entities

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in Russia. For example, the Tax Code of the Russian Federation establishes restrictions on the number of employees of an organization – only enterprises whose average number of employees does not exceed one hundred people can use the simplified taxation system. There is also a restriction on the level of income of companies that can use the simplified taxation system – annual income should not exceed one hundred and fifty million rubles. Thus, the simplified taxation system is suitable for individual entrepreneurs, micro and small enterprises (Federal Tax Service of the Russian Federation, n.d.).

2. Patent taxation system. This taxation system is suitable for individual entrepreneurs and microenterprises, since the legislation of the Russian Federation establishes restrictions on the average number of employees of enterprises entitled to use the patent taxation system, so no more than fifteen people should work at the enterprise. In addition, there are restrictions on the amount of income and types of activities of the enterprise. The income of the organization should not exceed sixty million rubles per year, and the main business activity of the company (individual entrepreneur) may be such areas as the provision of household services, transportation, wholesale and retail trade or activities for the provision of food and beverages. This is a short-term taxation system, since the period for which a company can be granted a patent is from one to twelve months. The tax rate under the patent taxation system is six percent, reporting is not required to the tax authorities, and the frequency of tax payment depends on the validity of the patent. So, if the patent is issued for a period of more than six months, the tax is paid in total not later than the expiration date of the patent. If the validity period of the patent is from six to twelve months, then the tax payments will be divided into two parts. The first part, one-third of the total amount of payments, the company (individual entrepreneur) is obliged to pay no later than ninety calendar days from the beginning of the patent validity date, and the second part, that is, two-thirds, of the payment must be paid no later than the expiration date of the patent (Federal Tax Service of the Russian Federation, n.d.)

3. The professional income tax is a special tax regime that can be used by citizens registered as self-employed or individual entrepreneurs. The main limitations, as in the above-described systems of taxation of entrepreneurs, is the annual income. Thus, the annual income of self-employed citizens or individual entrepreneurs should not exceed two million four hundred thousand rubles

annually, if this taxation system is used by an individual entrepreneur, then he should not have employees. Tax payments must be made by payers on a monthly basis. The tax base is income from the sale of goods (works or services), with the exception of income received by citizens under an employment contract and related payments, as well as social contributions and pensions. The percentage of tax levied is four percent of the income received from the sale of goods or the provision of services (work performed) to individuals. If a self-employed citizen or an individual entrepreneur sells his goods, provides services, or performs work commissioned by legal entities or individual entrepreneurs, then the tax rate will be six percent. Of all the previously considered systems, the process of switching to the professional income tax is the simplest, since to switch to this system, it is enough for a citizen to register as self-employed through the official website of the tax service or simply using a mobile application (Federal Tax Service of the Russian Federation, n.d.).

4. General taxation regime. The only taxation system at the moment that has no restrictions for entrepreneurs in terms of income or number of employees. However, this system is the most complex. The difficulty lies in the fact that an enterprise using the general taxation regime must submit quarterly reports to the tax authorities in the form of declarations. Companies are also required to pay tax payments quarterly. Of all the tax regimes currently existing in the Russian Federation, the general taxation regime has the highest tax rate – corporate income tax, which in Russia is twenty percent. The tax base for calculating the amount of tax is the company's income reduced by the amount of expenses, in other words, it is the company's income minus its expenses. It is also worth noting that the laws of the subjects of the Russian Federation may establish other tax rates, but they cannot be higher than the established maximum interest rate indicated above, that is, subjects have the right to reduce the tax rate at their discretion. Companies using the general taxation regime are also recognized as payers of value added tax and corporate property tax, which significantly increases the tax burden on the enterprise. The tax regime can be chosen not only by legal entities, but also by individuals - individual entrepreneurs. If an individual entrepreneur uses the tax regime, then the tax rate will be equal to the personal income tax, which in Russia is thirteen percent. Individual entrepreneurs, similarly to legal entities, must make advance payments quarterly, but the frequency of reports submitted to the tax authorities is much lower, declarations must be submitted once a year. Individual

entrepreneurs using the general taxation regime are also recognized as payers of value added tax, which, similarly to the above, increases the tax burden (Federal Tax Service of the Russian Federation, n.d.), (State Council of the Russian Federation, 1998)

3.3.4. Tax holidays

Tax holidays in Russia appeared in 2015. Initially, the government believed that this measure would be in effect for three years, that is, from 2015 to 2017 inclusive. Subsequently, the validity period was extended several times for economic reasons, at the moment the deadline is set until the end of 2023.

Tax holidays are the period established by the legislation of the Russian Federation during which an individual entrepreneur is exempt from paying taxes (one tax or several at once) (State Council of the Russian Federation, 2014)

Originally, only individual entrepreneurs were exempt from paying taxes, but with the onset of the pandemic, the list of recipients of this support measure was expanded so that microenterprises, as well as small and medium-sized enterprises.

Individual entrepreneurs and organizations engaged in the following fields of activity are exempt from taxes:

1.   Culture, organization of leisure and entertainment, including the activities of museums and zoos

2.   Activity of tourist organizations and other organizations providing services in the field of tourism and recreation

3.   Hotel business and catering

4.   Activities for the provision of household services to the population. This type of activity includes, for example, such services as dry cleaning, hairdressing and beauty salon services, repair

5.   Educational activities, namely the activities of organizations of additional education and non-state educational institutions

6.   Retail sale of non-food products (light vehicles and their components; textiles, clothing and footwear; cultural and entertainment goods; household goods of other purposes)

7.   Mass media

Organizations and individual entrepreneurs engaged in these areas can count on the following support measures:

1. For microenterprises: postponement of payment of insurance premiums for a period of 6 months

2. For organizations and individual entrepreneurs, the deadline for paying all taxes except personal income tax and value added tax is postponed for six months (if the organization or individual entrepreneur is included in the register of small and medium-sized businesses) or for three months (if it is not included in the register).

It is worth noting that the subjects of the Russian Federation can independently increase the terms of exemption of organizations from paying taxes and establish the most preferred areas of business for targeted support. Subjects cannot reduce the terms of deferral or exemption from taxes and fees, but they can increase them up to a period of up to two years. (Legal and tax advice, n.d.)

4. Practical Part

The analytical part of the thesis will present a statistical analysis of general economic indicators, indicators in the agricultural sector, as well as the technology and innovation sector to determine the presence or absence of trends in economic development and/or growth of the Russian Federation.

I have selected the following indicators as general indicators:

– The share of small and medium-sized enterprises in the gross domestic product of the Russian Federation in dynamics for the period from 2012 to 2020 is an indicator expressed as a percentage of all goods produced and services rendered in the territory of the Russian Federation by small and medium-sized enterprises from the total gross and domestic product.

– The amount of subsidies allocated from the federal budget to support small and medium-sized businesses in dynamics for the period from 2012 to 2020 is an indicator expressed in monetary terms (in the national currency of the Russian Federation – Russian rubles) in actual prices in the annual presentation.

– The consumer price index in quarterly presentation for the period from 2012 to 2020 is the main indicator for assessing the level of inflation. This is an indicator that is used to estimate changes in prices and tariffs for certain goods and services over a certain period of time.

– The unemployment rate in quarterly terms for the period from 2012 to 2020 – this indicator characterizes the current state of the country's economy, in accordance with the topic of the research work – the Russian Federation. The basic indicator is the indicator of the same quarter of the previous year.

– The producer price index in quarterly presentation for the period from 2012 to 2020 is an indicator characterizing the average level of price changes for raw materials, materials and intermediate consumption goods relative to the base period. In the analysis, the indicator will be presented in a quarterly presentation, the basic indicator is the indicator of the same quarter of the previous year.

The following indicators were selected as indicators used to analyze individual sectors of the economy:

1. Agriculture:

– Index of the physical volume of gross domestic product by type of economic activity "agriculture" as a percentage of the same period of the previous year (in constant prices)

- The volume of investments in fixed assets aimed at the development of agriculture in the Russian Federation during the study period. The indicator is presented in monetary terms, in actual prices in the national currency of the Russian Federation

- The volume of investments in fixed assets aimed at the development of the agricultural sector of the economy of the Russian Federation as a percentage of the total investment for the monitored period of time.

2. Technology and innovation:

- The share of high-tech and knowledge-intensive industries in the gross domestic product of the Russian Federation in percentage terms (as a percentage of the total gross domestic product of the Russian Federation)

- The volume of innovative goods and services in monetary terms in actual prices in the national currency of the Russian Federation. Unit of measurement - billions of rubles

- The percentage of organizations that have implemented technological innovations from the total number of organizations in percentage terms

In addition, auxiliary indicators will be used for the analysis, such as gross domestic product in constant prices in 2015, gross domestic product per capita, and events that led to changes in the studied indicators of economic growth of the Russian Federation will also be described.

4.1 Statistical analysis of economic indicators of the Russian Federation

4.1.1. Statistical analysis of general indicators of economic activity in Russia

To begin with, it is necessary to consider the trend in the share of small and medium-sized enterprises in the total gross domestic product of the Russian Federation (figure 3):

Figure 3. The share of SMEs in the GDP of the Russian Federation, %
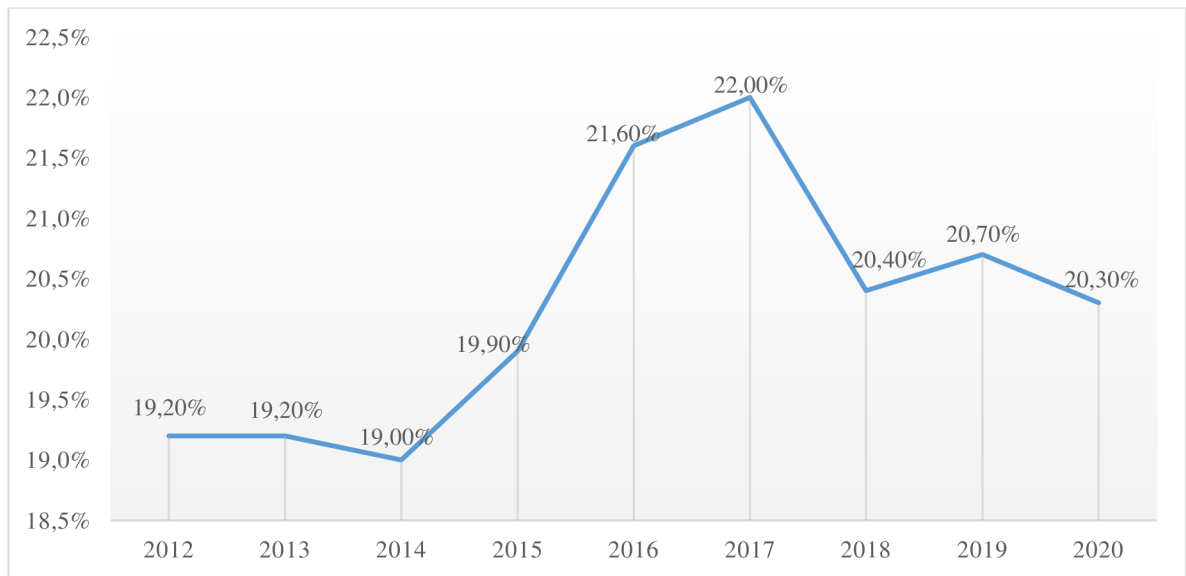
Sources: Own elaboration based on data retrieved from the Federal State Statistic Service (2016, 2018, 2020) (Federal State Statistic Service, 2016) (Federal State Statistic Service, 2018) (Federal State Statistic Service, 2020)

On Figure 1, "The share of SMEs in the GDP of the Russian Federation, %", we see a trend in the share of small and medium-sized enterprises in Russia's GDP. The fluctuation is quite insignificant - within 3% of the total GDP - private entrepreneurship in Russia has a very weak position compared to the countries of the European Union or the United States, In these countries the share of small and medium-sized businesses in GDP is more than 50%. (Renew Europe, 2021)

However, on the graph, we can observe slight trends in the increase in the indicator in the period from 2014 to 2017 and a subsequent sharp decline of 1.6% in 2018, followed by a downward trend.

To determine the reason for these changes, let us turn to the statistical data on the volume of GDP of the Russian Federation for the same period (figure 4):

Figure 4. GDP of the Russian Federation in constant 2015 US dollars (trillion)
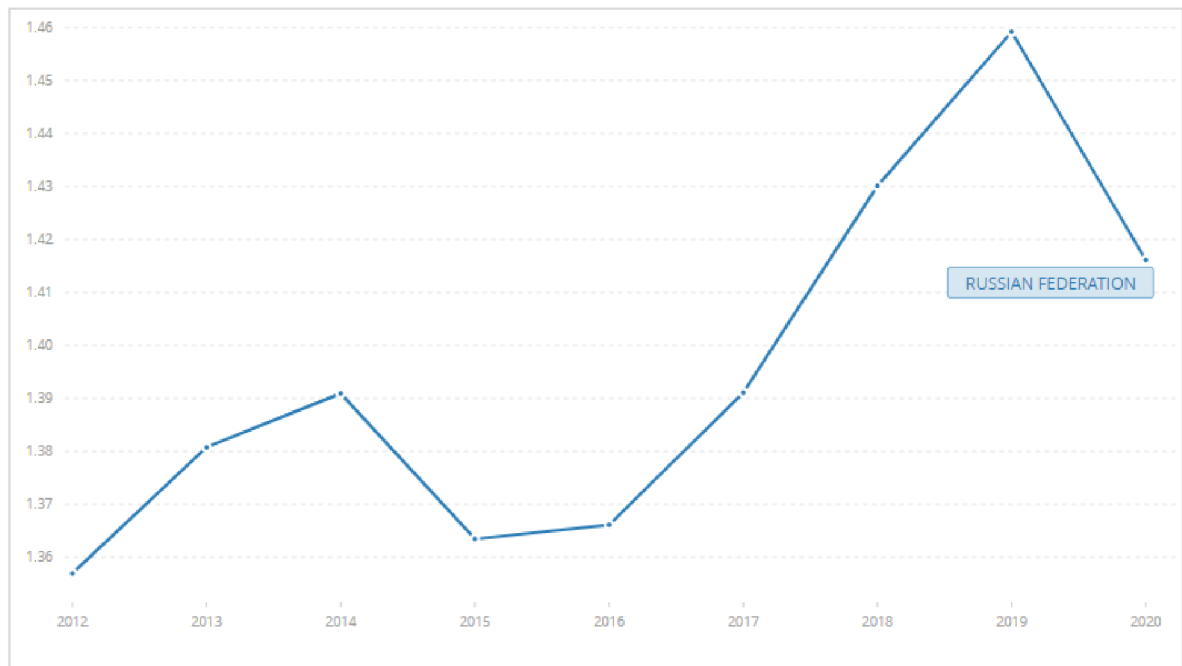
Source: (The World Bank, no date)

As follows from the Figure 2 "GDP of the Russian Federation in constant 2015 US dollars (trillion)", we can observe the opposite trend during the analyzed period of time: in the period from 2012 to 2014 and from 2018 to 2019, Russia's GDP is growing, while the share of small and medium-sized businesses in GDP tends to decrease, and vice versa, in the period from 2015 to 2017, when the share of small and medium-sized businesses is actively growing, GDP first falls sharply, and then begins to grow.

Next, let's look at how the volume of subsidies allocated from the federal budget to support small and medium-sized businesses in Russia has changed in dynamics (figure 5):

Figure 5. The amount of subsidies allocated from the federal budget for government support of SME, including peasant (farmer) farms, to the budgets of the constituent entities of the Russian Federation, million rubles
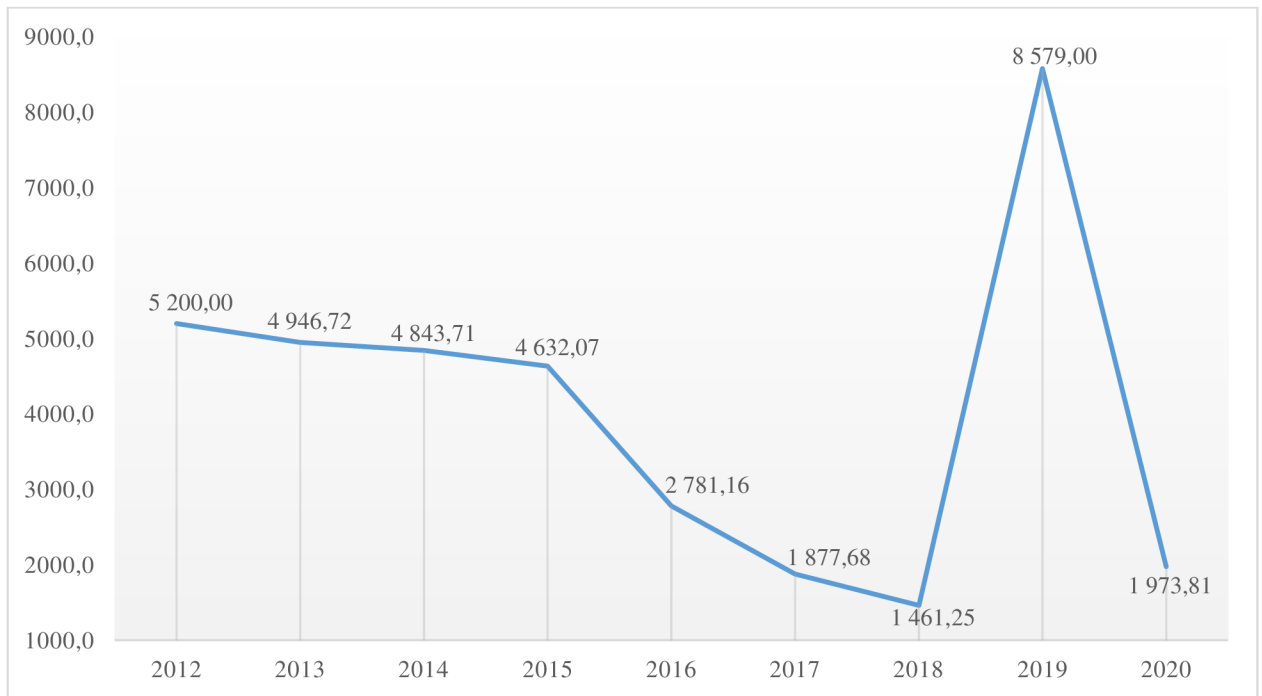

Source: Own elaboration based on data retrieved from the (Federal State Statistic Service, 2016); (Federal State Statistic Service, 2018) (Federal State Statistic Service, 2020); (Government of the Russian Federation, 2019)

As can be seen from the Figure 3 "The amount of subsidies allocated from the federal budget for government support of SME, including peasant (farmer) farms, to the budgets of the constituent entities of the Russian Federation, million rubles", the amount of subsidies allocated by the state to support Russian business has been steadily declining since 2012, despite a large number of state programs aimed at developing private entrepreneurship in the country. However, in 2019, with the launch of the national project and subordinate state programs, there is a sharp jump in the amount of subsidies allocated. According to the Decree of the Government of the Russian Federation No. 2961-r dated 09.12.2019, the amount of funds allocated from the federal budget of the Russian Federation for the provision of subsidies to small and medium-sized businesses amounted to more than 8.5 billion rubles, which is 5.87 times more than in the previous year. The same sharp decline, more than 4 times, was observed in the following year, 2020, when the country faced a pandemic and was forced to redistribute funds to social spheres (health and social support of the population) (I.Tkachev RBK News, 2021).

Next, consider the consumer price index for the analyzed period. The dynamics of changes in this indicator is shown in figure 6:

Figure 6. Consumer Price Index: Total All Items for the Russian Federation (growth rate same period previous year, quarterly, not seasonally adjusted)

Source: Own elaboration based on data retrieved from the (Federal Reserve Bank of St.Louis, no date)

The figure 6 shows that the largest increase was observed in 2015, a sharp jump caused by the introduction of economic sanctions after the events of 2014. The imposition of sanctions caused a sharp rise in prices for goods of its own production after restrictions were imposed on the import of goods from abroad. In this regard, own goods have significantly increased in price, thereby provoking a sharp increase in the consumer price index.

Together with the consumer price index, it was logical to consider how the prices of raw materials, materials and intermediate consumer goods of domestic producers changed. Figure 7 shows the dynamic change in the producer price index for the analyzed period:

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Figure 7. Domestic Producer Prices Index for Russian Federation (quarterly, not seasonally adjusted)
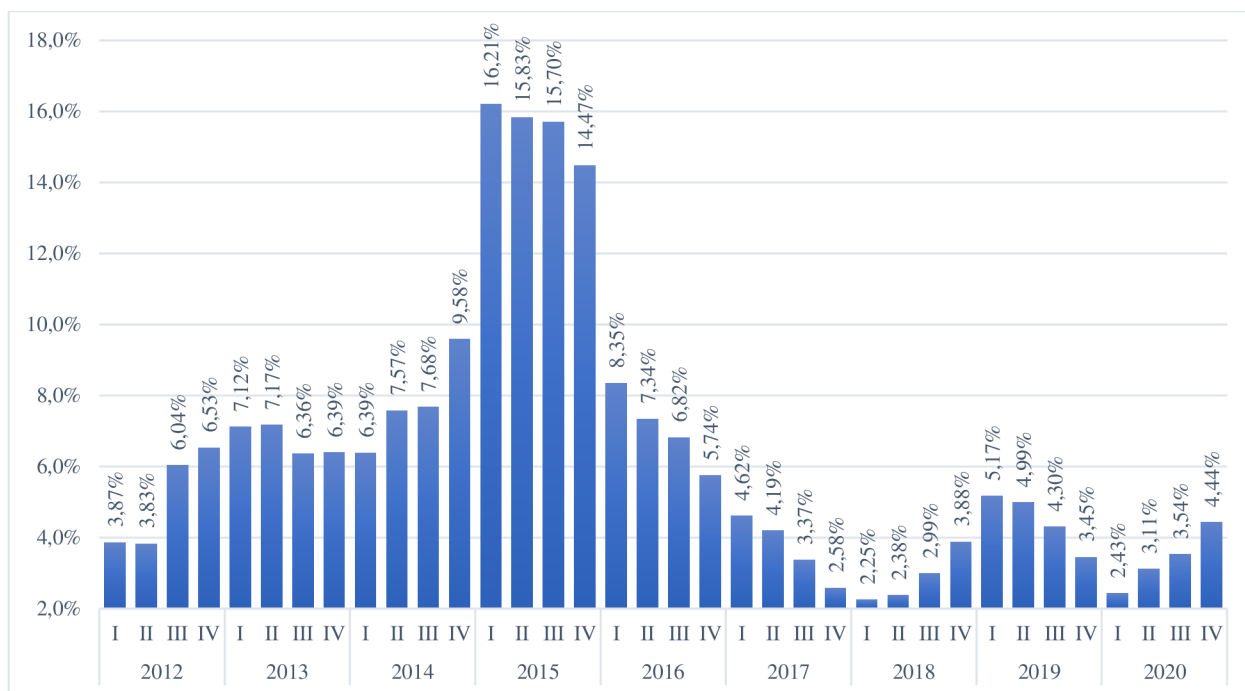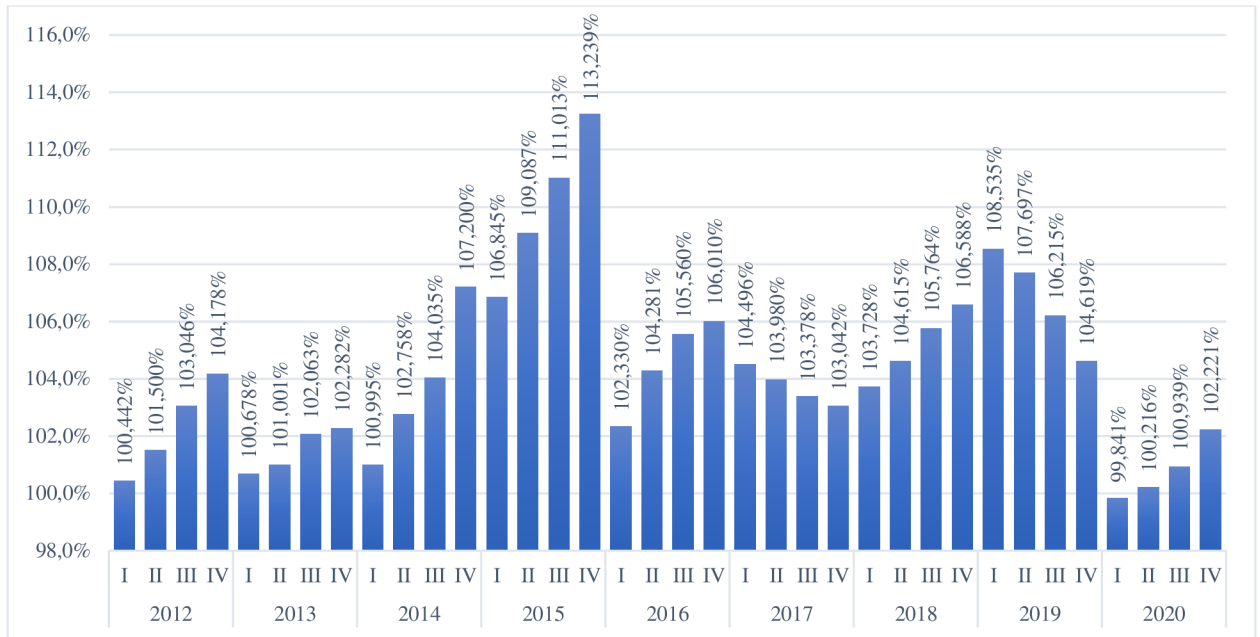

Source: Own elaboration based on data retrieved from the (Federal State Statistic Service, no date), (Federal State Statistic Service, no date)

On the figure 7 "Domestic Producer Prices Index for Russian Federation (quarterly, not seasonally adjusted)", we can observe a very similar situation in the nature of changes in the previous indicator. After the introduction of economic sanctions against the Russian Federation in 2015, there was a sharp jump in the producer price index, which is a consequence of a decrease in the amount of imported materials and raw materials and an increase in prices for analogues available in the country. Along with the number of goods imported into the territory of the Russian Federation, the number of goods, materials and raw materials that the country exported during that period of time (namely natural gas, oil and petroleum products, as well as products of large state corporations) has also fallen significantly, which, from my point of view, is the main factor in increasing the share of small and medium-sized businesses in the gross domestic product of Russia over the period under research (Morozenkova, 2017).

The situation with the level of registered unemployment in Russia has not changed much over the analyzed period of time and fluctuated in the range from 4.4 to 6.35 percentage points (Figure 8):

Figure 8. Unemployment rate (quarterly, not seasonally adjusted), %
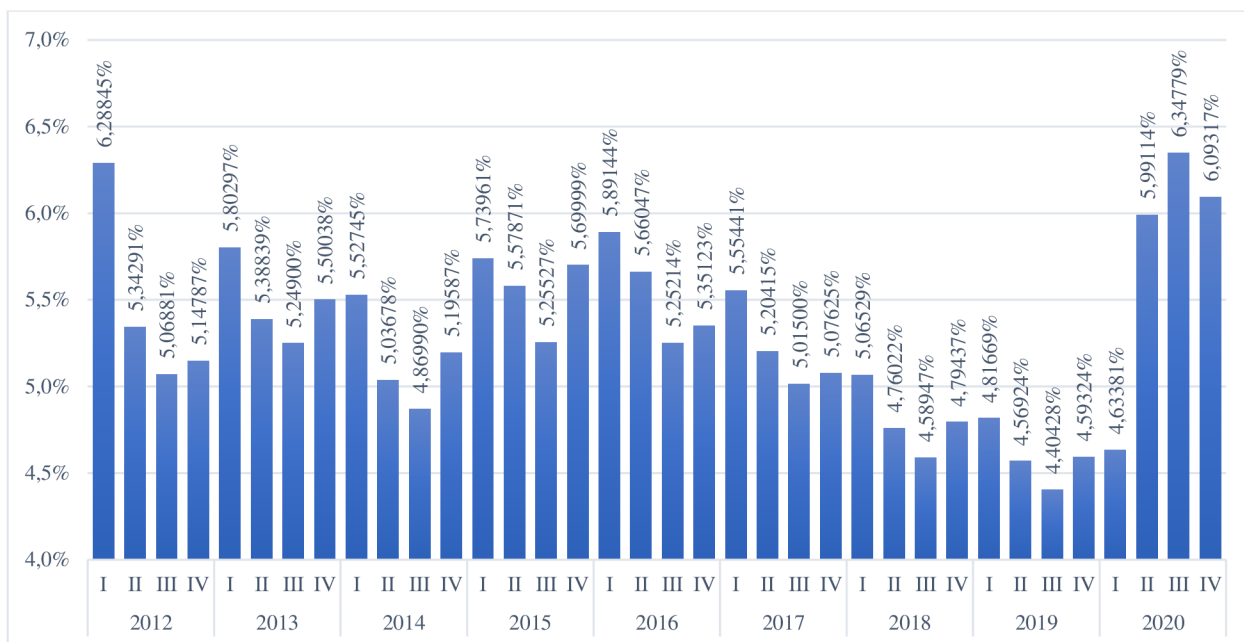
Source: Own elaboration based on data retrieved from the (Federal Reserve Bank of St.Louis, no date)

The figure 8 "Unemployment rate (quarterly, not seasonally adjusted), %" shows that the situation with the unemployment rate is relatively stable in comparison with the rest of the studied indicators. Although the unemployment rate also increased by about half a percentage point in 2015 and by 1.7% in 2020, when the COVID-19 pandemic was gaining momentum. Nevertheless, the unemployment rate in the Russian Federation is not critical and no deviations in the dynamics were detected (Kopytok V., 2021).

4.1.2. Statistical analysis of the agricultural sector of the Russian Federation

The main indicator for the statistical study of the agricultural sector of the economy of the Russian Federation in its study was the indicator "Index of the physical volume of gross domestic product by type of economic activity – agriculture". Let's take a closer look at the dynamics of the data for the analyzed period (Figure 9):

Figure 9. Indexes of the physical volume of GDP by type of economic activity - agriculture (as a % of the corresponding period of the previous year; in constant prices)
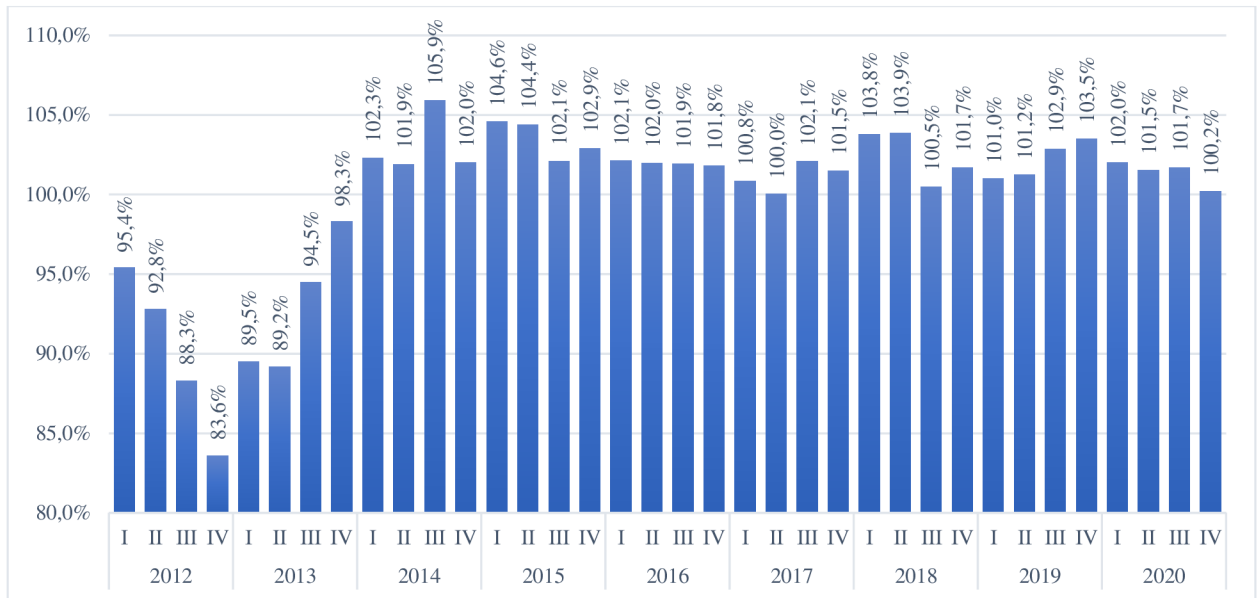
Source: Own elaboration based on data retrieved from the (The Eurasian Economic Commission, no date)

As can be seen from the figure 9 "Indexes of the physical volume of GDP by type of economic activity - agriculture (as a % of the corresponding period of the previous year; in constant prices)", the index of the physical volume of the Gross Domestic Product by type of activity "agriculture" in the Russian Federation at the beginning of the time period tended to decrease, with each quarter the volume of output decreased significantly relative to the same period of the previous year. Starting from the first quarter of 2014 and until the end of the analyzed period, we can observe a positive trend of changes, albeit very insignificant, taking into account the consequences of the fall at the beginning of the period under consideration.

In the analysis of general indicators, we looked at how producer price indices and consumer price indices changed in general for goods and services of all categories. To analyze the agriculture sector of the Russian Federation, let us consider in more detail how these indicators have changed directly for the agricultural sector of the Russian economy. To begin with, let us analyze consumer price indices (Figure 10):

Figure 10. Consumer price indexes for food products (December to December of the previous year, in %)
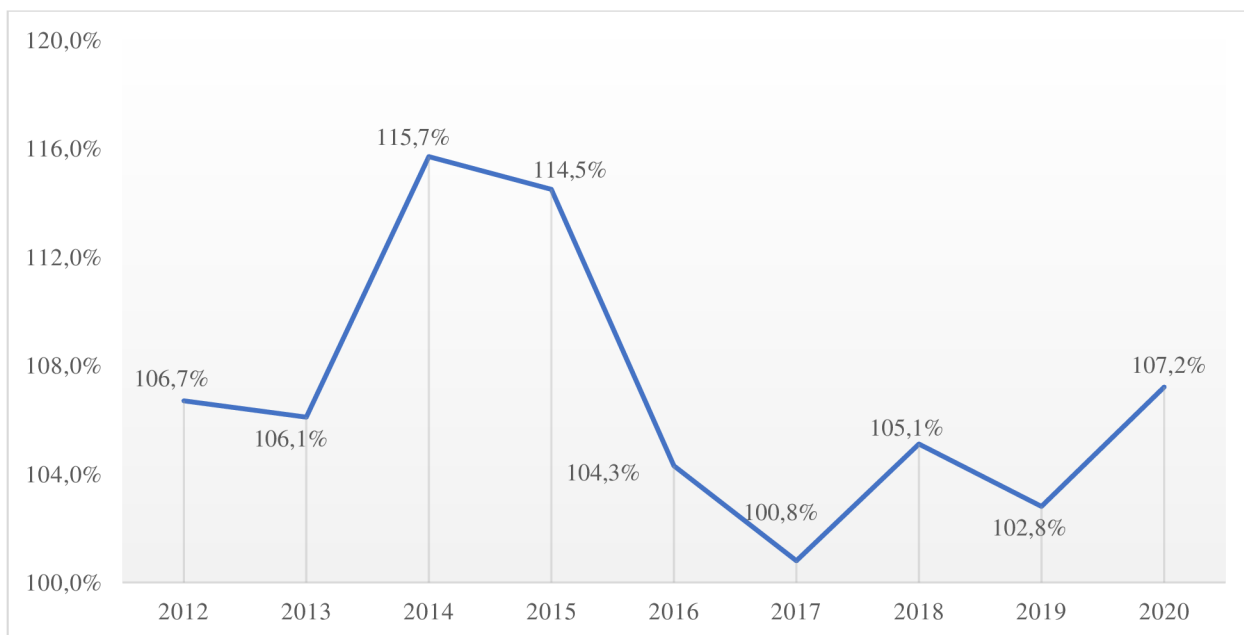
Source: Own elaboration based on data retrieved from the (Federal State Statistics Service of the Russian Federation , no date)

In comparison with the general consumer price index, the peak of growth of which was registered in 2015, the growth of consumer prices for food products (crop production, livestock, and fish farming), the peak of growth occurred a year earlier, that is, in 2014 with an insignificant decrease in the rate of price growth in 2015. The highest price increase in 2014 was for sugar (140% price increase), cereals and legumes (in 2014, the price increase for this category was 134.6%), as well as fruits and citrus fruits (123.7%). In subsequent periods (starting in 2015), the Government of the Russian Federation began regulating prices for basic foodstuffs in order to stabilize the situation, the consequences of these actions of the state are clearly visible on the graph. (Romashenko, 2015), (J.Vendik, 2015)

Now let's look at the price indices of agricultural producers for a more detailed analysis of the situation in the economic sector. Figure 11 shows the change in the producer price index in the annual presentation for the analyzed period:

Figure 11. Domestic Producer Prices Index for agriculture for Russian Federation (annual, % for the previous year)

Source: Own elaboration based on data retrieved from the (Federal State Statistic Service of the Russian Federation, n.d.)

Based on the figure 11 "Domestic Producer Prices Index for agriculture for Russian Federation (annual, % for the previous year)" data, we can note an extremely unstable situation in the field of crop production, where the sharpest fluctuations are observed for the entire period of time under consideration. Sharp jumps in the producer price index can be traced back to 2017, after which the situation began to gradually stabilize. Such fluctuations are seasonal, associated with factors beyond the control of producers, such as climatic changes and natural disasters (floods, landslides, droughts and fires), as well as changes in prices for raw materials, equipment and materials. The low yield of crop production entails fluctuations in the field of animal husbandry, since part of the crop production is an important component of animal husbandry. Thus, a crop failure of oats and barley or corn can lead to a decrease in the amount of meat products. Crop failure was observed in 2012, when a state of emergency was declared in part of the constituent entities of the Russian Federation due to droughts, in 2014 and 2018, which provoked sharp changes not only in crop production, but also in animal husbandry (Federal State Statistic Service, n.d.).

From economic indicators and agricultural indicators, let's move on to investment indicators. Let's consider the volume of investments in fixed assets aimed at the development of agriculture in the Russian Federation.

Figure 12 shows the total volume of investments in fixed assets in the analyzed sector of the economy:

Figure 12. Investments in fixed assets aimed at the development of agriculture, billion rubles

Source: Own elaboration based on data retrieved from the (Federal State Statistic Service of the Russian Federation, n.d.)

It should be noted that the indicator takes into account not only public investment, but also private investment, including. The data in the graph is presented in actual prices, that is, without taking into account inflation. From the very beginning to the end of the monitored period, we can observe a constant increase in the volume of investments in fixed assets. The only exception is 2015, in which the volume of investments decreased by 2.275 billion rubles, which is a consequence of the imposed economic sanctions and the outflow of foreign investment, as well as the result of the beginning of the economic crisis in connection with the events of 2014 (Bibkov A. RBK News, 2014). Subsequently, the Government of the Russian Federation has developed import substitution programs, including in the field of attracting investments (RIA News, 2015).

Since the data are presented in actual prices and did not take into account the growth rate of inflation, let's turn to investments in fixed assets as a percentage of the total number of investments in fixed assets in all sectors of the economy for the analyzed period (Figure 13):

Figure 13. Investments in fixed assets aimed at the development of agriculture, % of the total investment
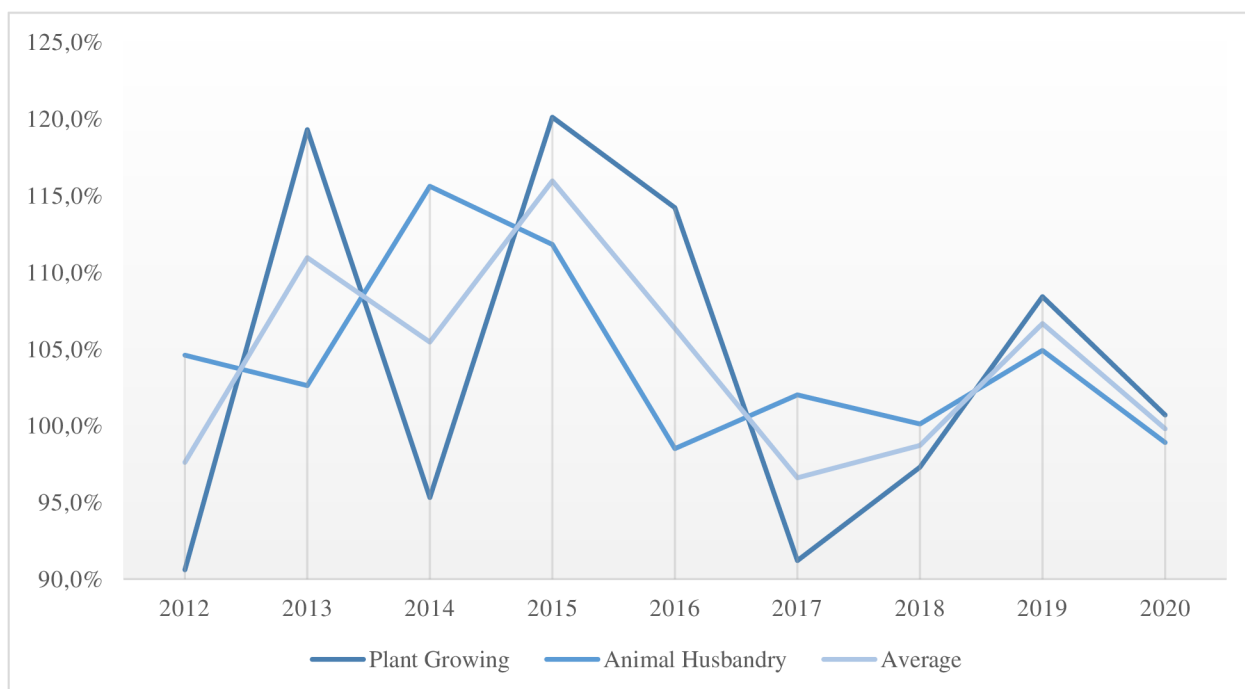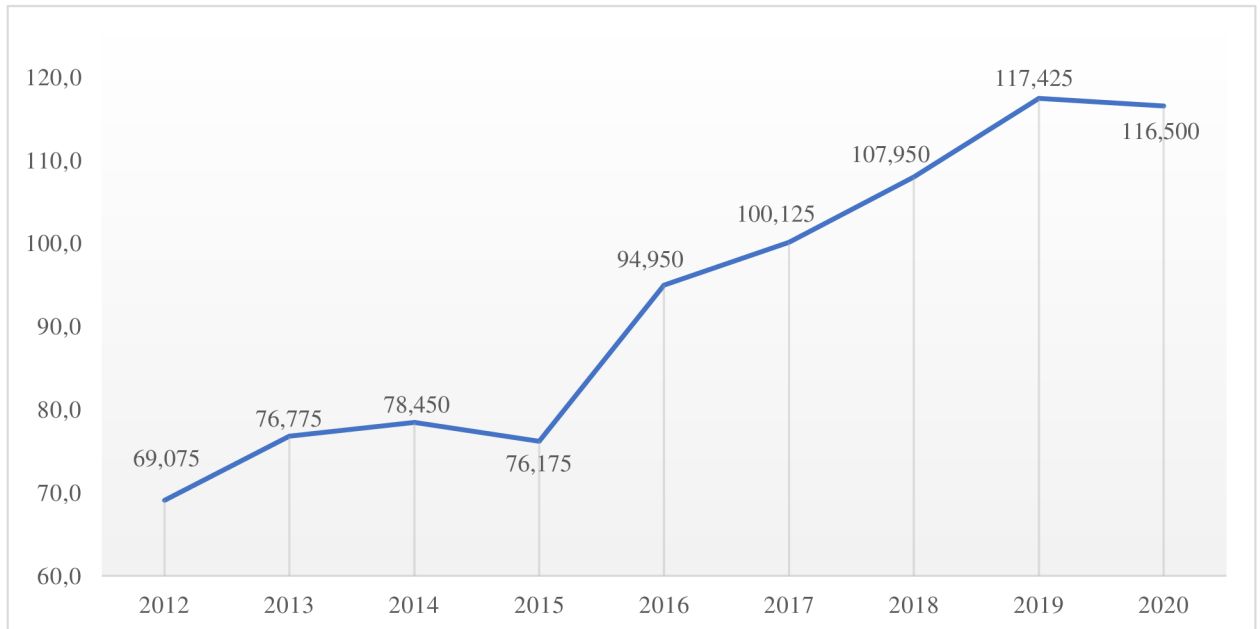

Source: Own elaboration based on data retrieved from the (Federal State Statistic Service of the Russian Federation, n.d.)

As follows from the figure 13 "Investments in fixed assets aimed at the development of agriculture, % of the total investment", the volume of investments in agriculture actually decreased in 2015, the volume of investments decreased by 0.1 percentage points compared to the previous year, and in the following year, 2016 increased by 0.5 percentage points of the total investment in fixed assets, which rejects the possibility of a hypothesis that a sharp increase in investment in 2016 could have been triggered by an exceptionally high level of inflation at that time, although, undoubtedly, inflation also affected the volume of investments.

It also follows from the graph that agriculture in the Russian Federation is not the most attractive for investors. This assumption is due to the fact that the average share of investments in fixed assets aimed at the development of agriculture in the Russian Federation is on average only 3.11% out of 100%, while mining (17.4%), transportation and storage (16.8%), manufacturing (14.6%) and real estate operations (16%) together account for almost 65% of the total number of investments.

Next, we will consider the actual participation of the state in investments in fixed assets aimed at the development of the agricultural sector and the structure of funds allocated from budgets of different levels.

Investments in fixed assets include own funds of organizations and attracted funds of investors. Figure 14 shows data on the structure of investments in fixed assets in percentage terms:

Figure 14. The structure of investments in fixed assets aimed at the development of agriculture in the Russian Federation, %

Source: Own elaboration based on data retrieved from the (Federal State Statistics Service of the Russian Federation , n.d.)

In the period from 2013 to 2016, there is a tendency to increase the share of attracted investments in fixed assets of agricultural organizations. At the same time, on this graph we see a general trend of a decrease in the share of funds raised since 2016, despite all existing government programs aimed at developing agriculture, import substitution and increasing the attractiveness of small and medium-sized businesses in Russia.

Table 1 shows the structure of investments in fixed assets of agricultural organizations in percentage terms (in actual prices):

Table 1. The structure of investments in fixed assets aimed at the development of agriculture in the Russian Federation, %

	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total funds	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
Own funds	46,8	44,8	52,7	59,2	58,5	56,3	52,1	52,9	54,6
Attracted funds	53,2	55,2	47,3	40,8	41,5	43,7	47,9	49,1	45,4
of which:									
Total budgetary funds	2,0	2,3	3,4	1,8	2,5	2,8	2,2	2,4	1,7
of which:									
Federal budget funds	0,7	1,1	1,9	0,7	1,2	1,1	1,0	1,3	0,9
Funds of the budgets of the subjects	1,2	1,0	1,4	1,0	1,2	1,6	1,0	1,0	0,7
Funds of municipal budgets	0,1	0,2	0,1	0,1	0,1	0,1	0,2	0,1	0,1

Source: (Federal State Statistics Service of the Russian Federation, n.d.)

As it can be noted, the percentage of state participation in investments in fixed assets is extremely small and practically insignificant in the scale of the total volume of investments and on average for the entire studied period of time is only 2.34%. Including funds from the federal budget of the Russian Federation on average amount to 1.1%, funds from the budgets of the subjects of the Russian Federation - 1.12%, and funds from the budgets of municipalities (local budgets of cities, urban and rural settlements, etc.) amount to an average of 0.12%, which Figure 13 clearly demonstrates:

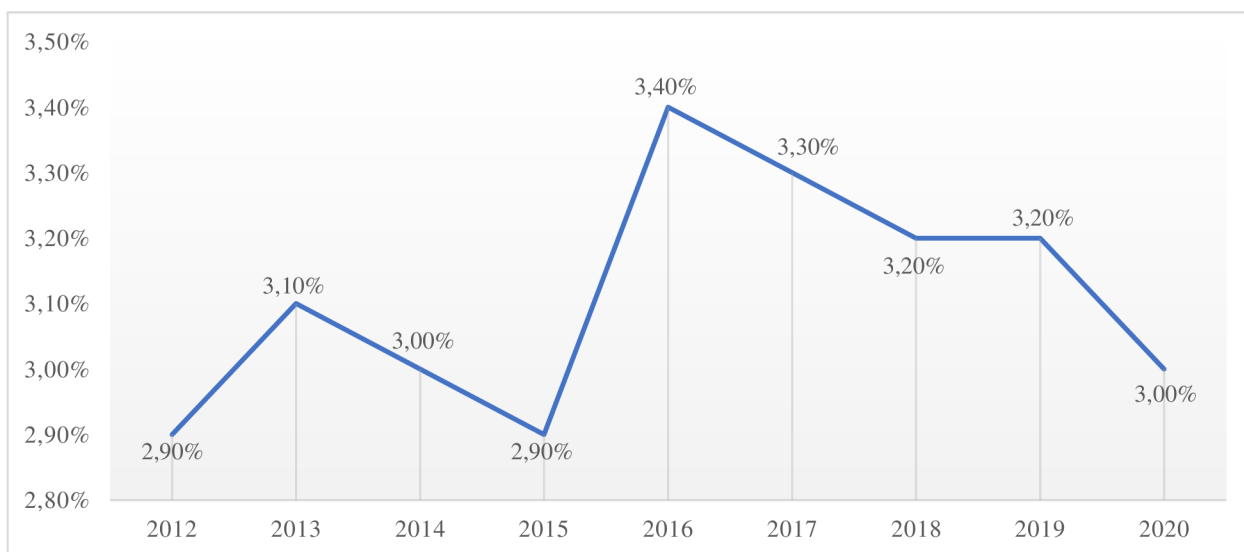*Figure 15. Government investments in fixed assets aimed at the development of agriculture (as a percentage of the total)*
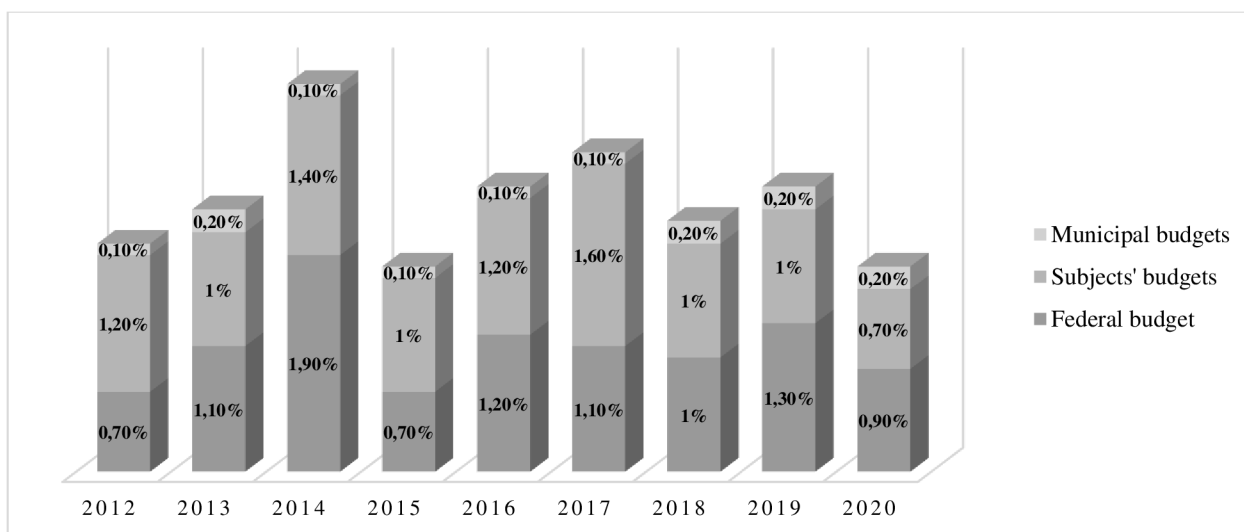
Source: Own elaboration based on data retrieved from the (Federal State Statistics Service of the Russian Federation, n.d.)
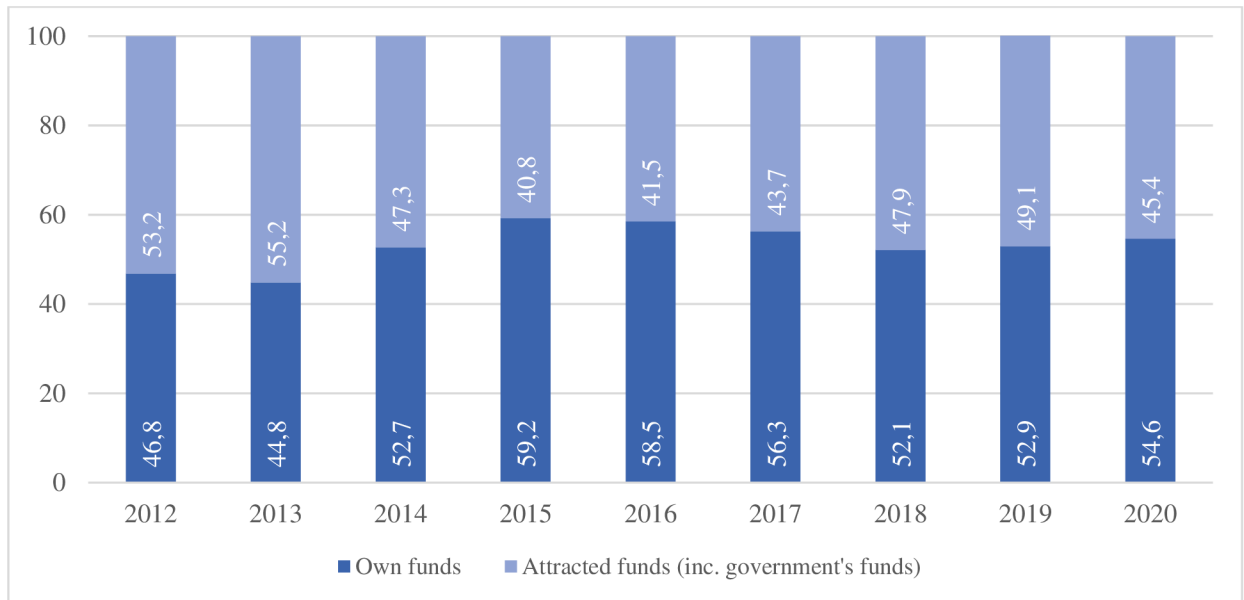
The data obtained from the Federal State Statistics Service of the Russian Federation allow us to conclude that the share of state participation in fixed capital investments aimed at the development of the agricultural sector is incomparably small compared to the amount of funds received from private investors for the entire analyzed period of time. This measure of business support by the state is used in very compressed volumes.

4.1.3. Statistical analysis of technologies and innovations in Russia

Technologies and innovations strongly influence the economic development and growth of each country, the level of availability of various kinds of technologies affects not only various sectors of the economy, the management system, but also the standard of living of citizens of the country.

Despite the existence of state programs aimed at the development of technologies and innovations in the country, the search and collection of data for the analysis of this economic sphere is quite problematic, due to the lack of data in quarterly presentation, the lack of structuring of the data available in official sources. On the websites of ministries, services and departments, information about this field of activity is presented very superficially, annual collections analyzing changes are presented only by the National Research University Higher School of Economics (HSE).

The following indicators were selected as the main indicators for the analysis:

- The share of high-tech and knowledge-intensive industries in the GDP (OKVED 2 data), % of the total
- The volume of innovative products (goods, services), billion rubles
- The percentage of organizations that have implemented technological innovations in the total number of organizations, %

To begin with, let's consider the dynamics of changes in the share of high-tech and knowledge-intensive enterprises in the gross domestic product of the Russian Federation for the period from 2012 to 2020 (Figure 16):

Figure 16. The share of high-tech and knowledge-intensive industries in the GDP (OKVED 2 data), % of the total
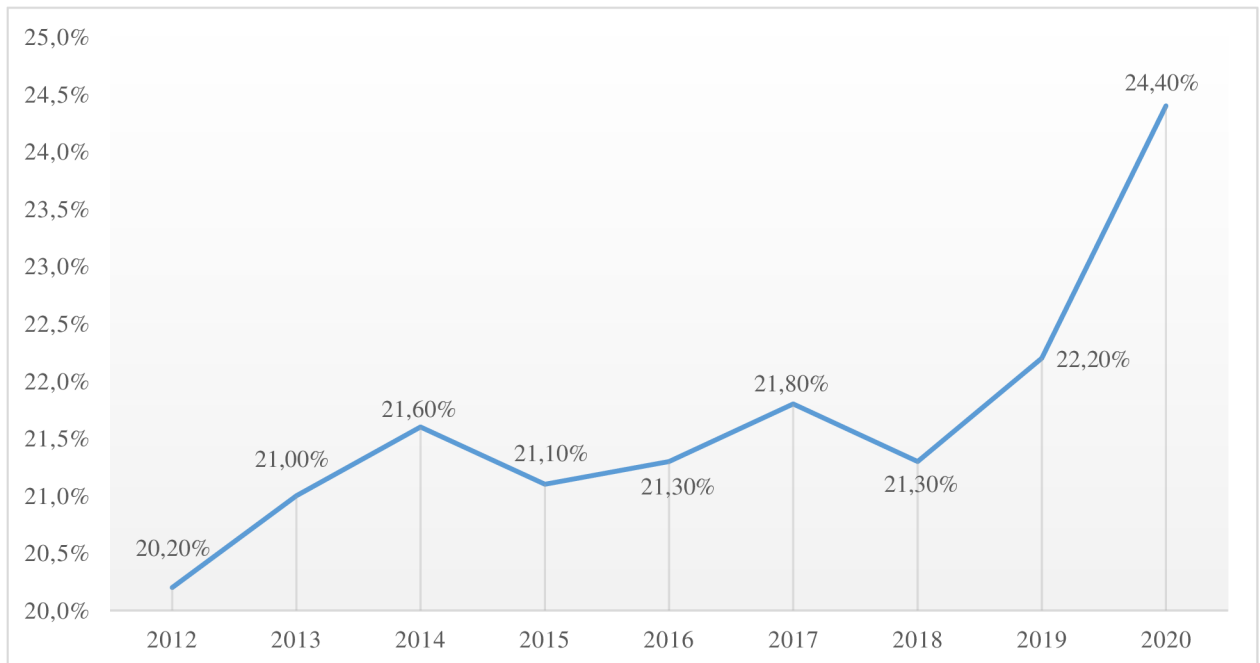
Source: Own elaboration based on data retrieved from the (Accounts Chamber of the Russian Federation, n.d.)

As follows from the figure 16 "The share of high-tech and knowledge-intensive industries in the GDP (OKVED 2 data), % of the total", the general trend in the share of high-tech and knowledge-intensive enterprises is positive. The growth from 2012 to 2020 was 4.2 percentage points. However, it is worth noting the indicators of two years - 2015 and 2018 - where the share of high-tech and knowledge-intensive enterprises in the gross domestic product of the Russian Federation decreased by 0.5% percentage points of the total gross domestic product in both cases. As in the case of the agricultural sector of the economy, this may be due to inflationary fluctuations, economic sanctions, lack of financing and a general reduction in the number of products produced by such enterprises.

Next, we will consider the volume of innovative products produced – goods and services produced (rendered) on the territory of the Russian Federation.

It should be noted that innovative goods and services from the point of view of Russian legislation include goods and services that meet the following requirements:

1. Scientific and technical novelty. The characteristics (functional name of the goods, the composition of the materials from which the goods are made, the scope of use of such goods) of innovative goods are fundamentally new and (or) have significant differences from the characteristics of analog goods. The properties

of the product for the consumer should be better than analog products, including in terms of the functionality of the innovative product. Also, an innovative product is a product whose production is carried out using new and/or modernized technological equipment, technological processes or technologies that allow improving the performance of the product (consumer, ergonomic or technical and economic properties)

2.   Availability of patent rights. This criterion is applied when patents for the results of intellectual activity (goods or services) are required in the production of innovative goods or services

3.   A service is considered innovative if it is provided through the use of high-tech equipment, new technologies and/or software, or is fundamentally new, that is, not previously provided, or if such a service is provided in an area in which it or similar services have not previously been used (Ministry of Communications and mass communications Russian Federation, 2013).

Figure 17 shows data on the volumes of innovative goods and services produced on the territory of the Russian Federation in actual prices:

Figure 17. The volume of innovative products (goods, services), billion rubles
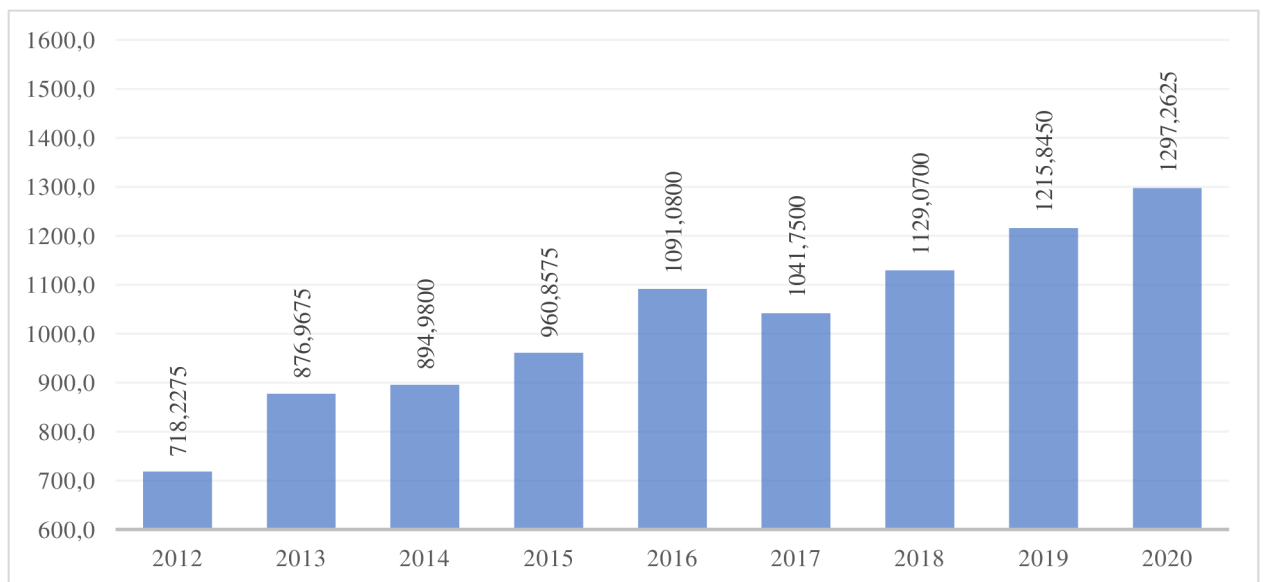
Source: Own elaboration based on data retrieved from the (National Research University Higher School of Economics , n.d.)

The figure 17 "The volume of innovative products (goods, services), billion rubles" also shows a steady positive dynamic of changes in the volume of innovative goods produced and the volume of innovative services rendered. Despite the change in the inflation rate during the

analyzed period, it is safe to say that the volume of innovative goods and services has really grown over the period under review. The sharp increase in 2013 may be due to the approval of Order No. 286 of 10.10.2013 of the Ministry of Digital Development, Communications and Mass Communications, which defines the criteria for classifying goods and services as innovative.

The last indicator, which we will consider during the analysis of technologies and innovations in the Russian Federation, reflects the proportion of organizations that have introduced technological innovations from the total number of organizations in percentage terms (Figure 16):

Figure 18. The percentage of organizations that have implemented technological innovations in the total number of organizations, %
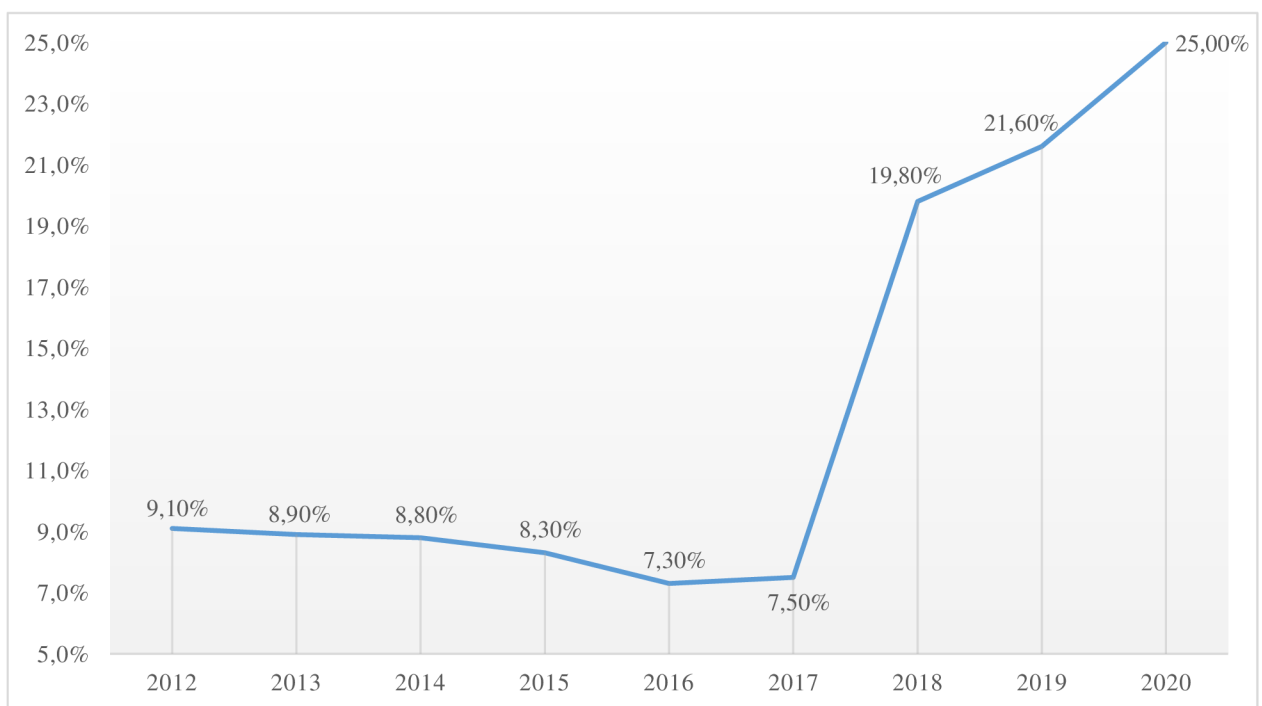
Source: Own elaboration based on data retrieved from the (National Research University Higher School of Economics , n.d.)

The figure 16 "The percentage of organizations that have implemented technological innovations in the total number of organizations, %" clearly shows the general trend towards a decrease in the share of organizations that have introduced technological innovations. In the period from 2012 to 2017, the share of such organizations decreased by 1.6 percentage points, and in 2016 the indicator was minimal and amounted to 7.3%, that is, it was 1.8% lower than in 2012. Further in 2018 and subsequent years, we see sharp changes in the share of organizations that have

introduced technological innovations. The difference between 2017 and 2018 was as much as 12.3%, that is, the indicator in 2018 increased by 2.64 times compared to the level of 2017.

This may be due to the fact that the criteria for calculating the indicator were revised approximately in this period of time. Official sources do not provide documents on how the calculation methodologies have changed. On the website of the Federal State Statistics Service of the Russian Federation, only the current methodology for calculating all indicators related to innovation activity is publicly available.

4.2. Econometric analysis of the impact of government support measures on the agricultural sector of the Russian economy

4.2.1. Methodology and main time series models

The data we have for the analysis is a time series data – the data collected for a single entry (in our case Russian Federation) at the multiple points of time (quarterly for the period of 2014Q1 – 2020Q4). As Stock and Watson note, the most of standard regression models can be applied to the time series only if they are stationary (J.H. Stock, M.W. Watson, 2020).

A time series is said to be stationary if its probability distribution remains unchanged over time. The notion of stationarity plays an important role in time-series regressions (Pesaran, 2016).

More formal definition of stationarity (or strict stationarity) is given by Hamilton (1994): "A process is said to be strictly stationary if, for any values of $j_1, j_2, ..., j_n$ the joint distribution of $Y_t, Y_{t+j1}, Y_{t+j_2}, ..., Y_{t+j_n}$ depends only on the intervals separating the dates $j_1, j_2, ..., j_n$ and not on the date itself" (Hamilton J.D., 1994).

Intuitively, a stationarity assumes that we can use historical data to predict the future values of a time-series because its distributional properties do not change over time.

For the univariate time series, the conventional test for the stationarity is the augmented Dickey-Fuller (ADF) test (Dickey D.A., Fuller W.A., 1981). Another name of the stationarity test is the "unit root test".

Formally, the ADF test can be performed in the following way. First, we consider the autoregressive model of order p:

$$\Delta y_t = \beta + \delta y_{(t-1)} + \gamma_1 \Delta y_{(t-1)} + \gamma_2 \Delta y_{(t-2)} + \cdots + \gamma_{(p-1)} \Delta y_{(p-1)} + U_t$$

(1)

The unit root hypothesis is $H_0: \delta = 0$, against $H_1: \delta < 0$

As it was said, in order to implement most of the time-series models, we must verify that the time series used are stationary.

The other important feature of time series is autocorrelation (or serial correlation). Stock and Watson define serial correlation as "the correlation of a series with its own lagged values". The first autocorrelation is the correlation between y_t and y_{t-1}, the second autocorrelation is the correlation between y_t and y_{t-2}, etc. (J.H. Stock, M.W. Watson, 2020).

If the variable of interest is serially correlated, the OLS residuals also would have serial correlation. In this case, the usual statistical inference is not applicable and might be misleading (Pesaran, 2016).

Usually, in order to prevent the problem of a residuals serial correlation, we must include into the model the lag of a dependent variable. This type of model is called "autoregressive model distributed lag model". The general form of such model with the addition of independent variables is presented below.

The autoregressive distributed lag model, ADL(p, q), with p lags of Y_t and q lags of X_t, is:

$$Y_t = \beta_0 + \beta_1 Y_{(t-1)} + \beta_2 Y_{(t-2)} + \dots + \beta_p Y_{(t-p)} + \delta_1 X_{(t-1)} + \delta_2 X_{(t-2)} + \delta_q X_{(t-q)} + U_t$$

(2)

where $\beta_0, \beta_1, \dots \beta_p, \delta_1, \delta_2, \dots, \delta_q$ are unknown coefficients and U_t is the error term.

The ADL model does not include the current values of the independent variables X_{t-s}. If we include X_t, it would not be clear, which variable, X_t or Y_t is independent, because usually in the time series framework, both variables affect each other (simultaneity) or they are both affected by some third variable. In this case we apply a vector autoregression (VAR) model.

VAR model for two time series X_t and Y_t includes two equations, where these variables play the role of a dependent variable. In the first equation the dependent variable is Y, in the second equation the dependent variable is X_t:

$$Y_t = \beta_{10} + \beta_{11} Y_{(t-1)} + \dots + \beta_{1p} Y_{(t-p)} + \delta_{11} X_{(t-1)} + \dots + \delta_{1q} X_{(t-p)} + U_{1t}$$

(3)

$$Y_t = \beta_{20} + \beta_{21} Y_{(t-1)} + \dots + \beta_{2p} Y_{(t-p)} + \delta_{21} X_{(t-1)} + \dots + \delta_{2q} X_{(t-p)} + U_{2t}$$

(4)

The general VAR(k) model consist of k time series regressions, in which the regressors are lagged values of all k series (J.H. Stock, M.W. Watson, 2020).

The coefficients of the VAR are estimated by estimating each of the equations by ordinary least squares (OLS).

For the non-stationary time series, the concept of "integration" is also used. A series with the unit root is said to be integrated of order one, or I(1). Usually, in order to model such series, we take the first difference. If a series of first differences has a unit root, then series is said to be integrated of order two, of I(2). A series without s unit root is stationary, or integrated of order zero, or I(0) (J.H. Stock, M.W. Watson, 2020).

The order of integration shows how many times the series must be differenced in order to obtain the stationary series.

When two or more series have unit roots (are nonstationary) they can demonstrate some relationship, when in reality they are not related at all. This situation is called "spurious regression". In the case of a spurious regression, the OLS regression of one nonstationary series on the other nonstationary series can be misleading.

But in practice nonstationary series can be related and it is possible to provide a reasonable rationale behind this relationship. If two or more nonstationary series move together over time and the difference between them appears to be almost constant, they are called cointegrated.

If series X_t and Y_t are integrated of order one (that is, have a unit root) and there is some coefficient θ such that $Y_t - \theta X_t$ is integrated of order zero (that is, stationary), then the series X_t and Y_t are called cointegrated (Stock and Watson, 2020). The difference $Y_t - \theta X_t$ eliminated the stochastic trend.

When two or more series are cointegrated, their first differences can be modelled with the help of VAR, including the term $Y_t - \theta X_t$ as an additional regressor. This model is called a vector error correction model (VECM) where past values of $Y_t - \theta X_t$ help to predict future values of differences ΔY_t and ΔX_t. The term $Y_t - \theta X_t$ is called the error correction term.

The VECM model for two variables has two equations with numbers 5 and 6:

$$\Delta Y_t = \beta_{10} + \beta_{11}\Delta Y_{(t-1)} + \cdots + \beta_{1p}\Delta Y_{(t-p)} + \delta_{11}\Delta X_{(t-1)} + \cdots + \delta_{1q}\Delta X_{(t-p)} +$$
$$+\alpha_1(Y_{(t-1)}\theta X_{(t-1)}) + U_{1t}$$

(5)

$$\Delta Y_t = \beta_{20} + \beta_{21}\Delta Y_{(t-1)} + \cdots + \beta_{2p}\Delta Y_{(t-p)} + \delta_{21}\Delta X_{(t-1)} + \cdots + \delta_{2q}\Delta X_{(t-p)} +$$
$$+\alpha_2(Y_{(t-1)}\theta X_{(t-1)}) + U_{1t}$$

(6)

Now after the outline of the main models for time-series we move to the empirical analysis of the series related to the research questions of the thesis.

4.2.2. Descriptive statistics and univariate time series analysis

We start the analysis of the variables with the descriptive statistics. In order to make an analysis compact, we gave the following names for the variables used:

- *prod* – Gross Value Added in basic prices by category agriculture, in millions of rubles (Federal State Statistic Service of the Russian Federation, n.d.); (Federal State Statistic Service of the Russian Federation, n.d.)

- *loans* – Volume of loans to businesses and individual entrepreneurs in the agricultural sector, millions of rubles (Federal State Statistic Service of the Russian Federation, n.d.)

- *tax_audits* – The number of on-site tax audits of organizations carried out, units (Federal State Statistic Service of the Russian Federation, n.d.)

- *investment* – Direct investments in Russia by type of economic activity (agriculture), millions of rubles (Federal State Statistic Service of the Russian Federation, n.d.)

- *machinery* – Availability of serviceable agricultural machinery (tractors) in agricultural organizations, units (Federal State Statistic Service of the Russian Federation, n.d.)

- *salary* – Average monthly salary of agricultural employees, rubles (Federal State Statistic Service of the Russian Federation, n.d.)

- *emergency* – Number of emergency situations on the territory of the Russian Federation, units (Federal State Statistic Service of the Russian Federation, n.d.)

The data table for the analysis is presented in Appendix A « Data for econometric analysis of the agricultural sector of the Russian economy».

The summary statistics for the chosen variables are shown below:

Figure 19. Gretl output: Summary statistics


```
gretl: summary statistics                          —    □    ×

                  Mean      Median        S.D.         Min         Max
prod        6.888e+005  6.133e+005  3.866e+005  1.884e+005  1.490e+006
loans       9.697e+005  7.263e+005  8.098e+005  1.802e+005  2.978e+006
tax_audits        4852        5043        2440       159.0        9029
investment       618.0        1255        5104  -1.368e+004        8928
machinery   4.005e+005  4.041e+005       23670  3.482e+005  4.385e+005
salary           25963       25554        7030       14030       40756
emergency        71.03       65.50       26.15       36.00       154.0
```

Source: Own work using Gretl

As we can see, the agricultural gross value added on average accounts for around 688.8 bln RUR and has a large variability from 188 bln RUR to 1490 bln RUR. Partially this variability can be attributed to the seasonality of an agricultural production.

The volume of loans to businesses and individual entrepreneurs in the agricultural sector serves as one of the two variables representing government support of an agricultural sector. As we can note, the average amount of loans was almost 970 bln RUR with the standard deviation of 810 bln RUR and the maximum of almost 3 trln RUR.

The number of tax audits of agricultural organizations also has a large variability over the analyzed period.

Other variables are used as additional control variables in order to prevent the omitted variables bias problem. According to the economic theory, production depends on the level of capital and labor employed in the industry. Therefore, we choose variables machinery and salary as proxies for capital and labor.

The next figure represents the plots of the series used in the analysis:

Figure 20. Gretl output: Representation of the plots of the series used
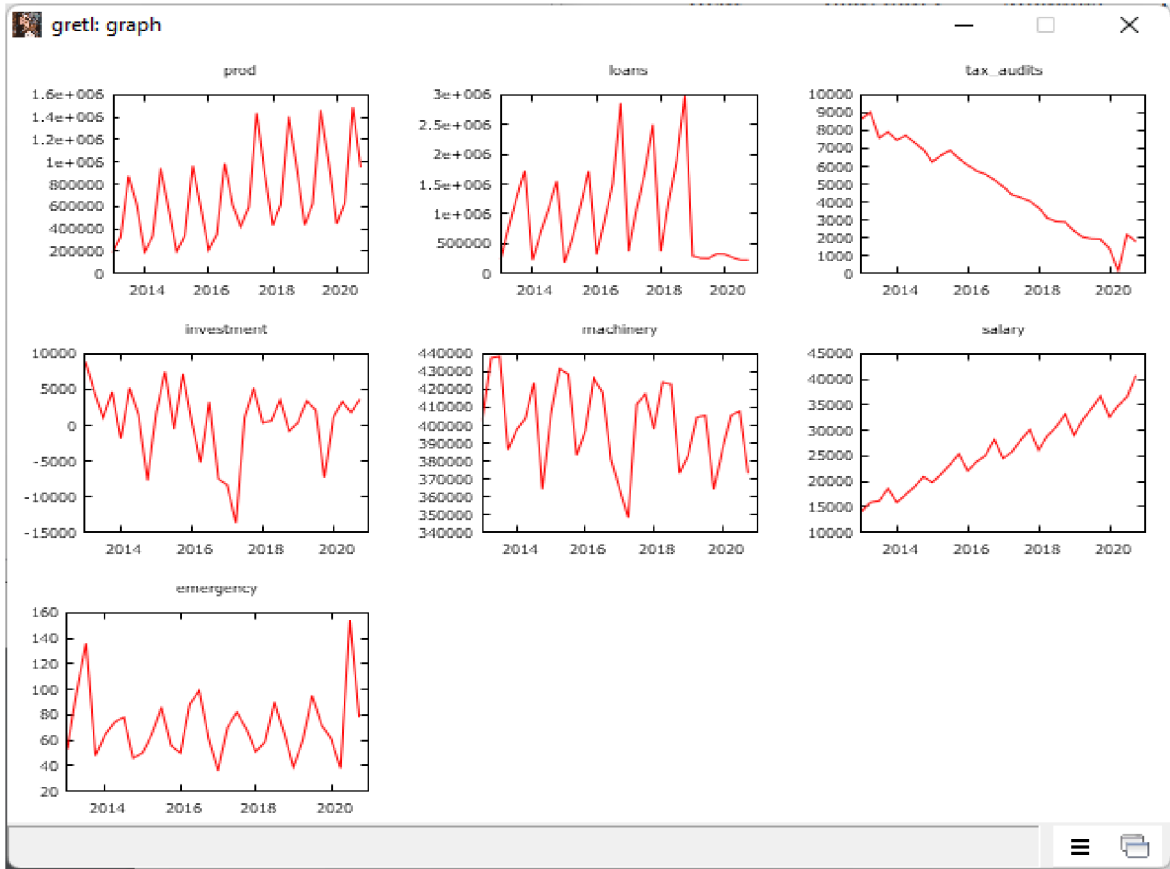
Source: Own work using Gretl

Clearly, variables prod and loans demonstrate the seasonal behavior and needed to be cleared from the seasonal component. Moreover, we see a weak upward trend in the variable prod, while for the variable loans there is no visible trend.

The variable *tax_audits* demonstrated strong downward trend over the analyzed period without any particular seasonality.

The variables investment, machinery and emergency are fluctuating seasonally around the stable mean and seem to be stationary on the analyzed interval.

Finally, the variable salary demonstrates a strong upward trend with seasonality, which must be cleaned for the further analysis.

In order to exclude the seasonal component from the series we apply the Hodrick-Prescott (HP) filter which decomposes series Y_t into two parts: a trend component, Y_t^* and a cyclical component, c_t (Hodrick R., Prescott E.C., 1997):

$$Y_t = Y_t^* + c_t$$

(7)

After the exclusion of the seasonal component from all variables but tax_audits, their trends are displayed below:

Figure 21. Gretl output: Trends
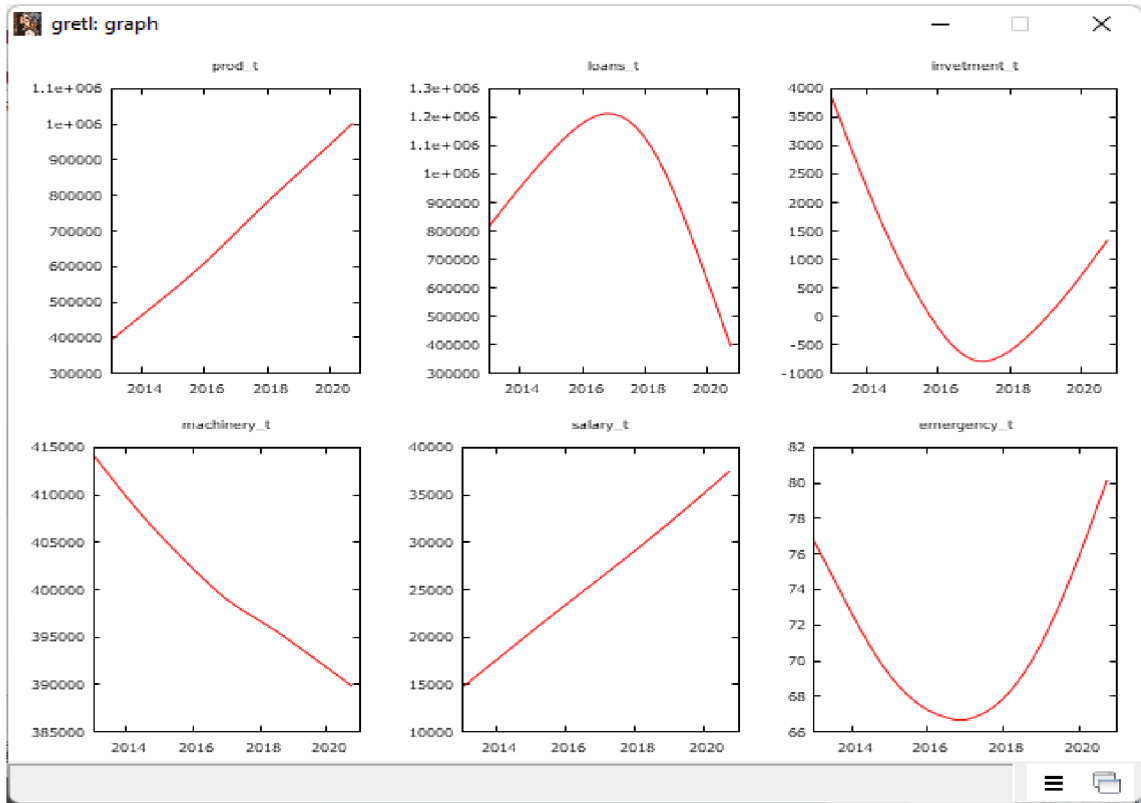
Source: Own work using Gretl

The variables *prod_t* and *salary_t* after the exclusion of seasonality demonstrate strong upward trend. The variables *investment_t* and *emergency_t* are U-shaped and *loans_t* is inverse U-shaped. Lastly, the variable *machinery_t* demonstrates the downward trend.

While applying the econometric models we will use both initial series and series without seasonal component in order to compare results and choose the most reasonable model to verify the impact of the government support on the agricultural productivity.

We continue the analysis of variables with the ADF test for unit root.

In order to preserve the space, we display the gretl output of the ADF test for only one variable, prod, while the other test results are displayed in the table below:

58

Figure 22. Gretl output: ADF test for Prod


```
gretl: ADF test                              —    □    ×

Augmented Dickey-Fuller test for prod
testing down from 9 lags, criterion BIC
sample size 27
unit-root null hypothesis: a = 1

  test with constant
  including 4 lags of (1-L)prod
  model: (1-L)y = b0 + (a-1)*y(-1) + ... + e
  estimated value of (a - 1): -0.122618
  test statistic: tau_c(1) = -1.17344
  asymptotic p-value 0.6882
  1st-order autocorrelation coeff. for e: 0.095
  lagged differences: F(4, 21) = 118.699 [0.0000]

  with constant and trend
  including 4 lags of (1-L)prod
  model: (1-L)y = b0 + b1*t + (a-1)*y(-1) + ... + e
  estimated value of (a - 1): -0.676197
  test statistic: tau_ct(1) = -2.47652
  asymptotic p-value 0.3399
  1st-order autocorrelation coeff. for e: -0.029
  lagged differences: F(4, 20) = 117.588 [0.0000]
```

Source: Own work using Gretl

As we can see from the gretl output, the unadjusted series prod has a unit root and therefore is not stationary (p-values are much higher than 5%). Next, we can check, if the first difference of prod is stationary:

Figure 23. Gretl output: ADF test


```
gretl: ADF test                              —    □    ×

Augmented Dickey-Fuller test for d_prod
testing down from 9 lags, criterion BIC
sample size 27
unit-root null hypothesis: a = 1

  test with constant
  including 3 lags of (1-L)d_prod
  model: (1-L)y = b0 + (a-1)*y(-1) + ... + e
  estimated value of (a - 1): -1.24895
  test statistic: tau_c(1) = -1.94599
  asymptotic p-value 0.3113
  1st-order autocorrelation coeff. for e: 0.140
  lagged differences: F(3, 22) = 272.611 [0.0000]

  with constant and trend
  including 3 lags of (1-L)d_prod
  model: (1-L)y = b0 + b1*t + (a-1)*y(-1) + ... + e
  estimated value of (a - 1): -1.234
  test statistic: tau_ct(1) = -1.88164
  asymptotic p-value 0.664
  1st-order autocorrelation coeff. for e: 0.131
  lagged differences: F(3, 21) = 261.896 [0.0000]
```

Source: Own work using Gretl

So, the first difference of prod is also not stationary (p-values are much above 5%).

The second difference of prod is stationary, therefore, the series prod is integrated of order 2.

The unit root test results for the other variables are displayed below:

Table 2. Unit root test results

Series name	Order of integration
prod	2
loans	1
tax_audits	1
investment	1
machinery	0
salary	1
emergency	1

Source: Own work using Gretl

Having discussed the main features and the dynamics of the series, we move to the estimation of the regression models

4.2.3. Regression analysis and the results

We start the investigation the effect that the government support has on the agricultural production with the simple OLS regression.

We use two model specifications:

$$\Delta\Delta Prod_t = \beta_0 + \beta_1 \Delta Support_{(t-1)} + U_{1t}$$

(8)

$$\Delta\Delta Prod_t = \beta_0 + \beta_1 \Delta Support_{(t-1)} + \gamma X_{(t-1)} + U_{1t}$$

(9)

Where $\Delta\Delta Prod_t$ is the second difference of a prod variable

$\Delta Support$ is the first difference of one of two government support variables: loans or tax_audit

X_t is the vector of other covariates: $\Delta investment, \Delta salary, \Delta emergency$

The results of the estimation of the models 8, 9 are displayed below:

Table 3. OLS Regression Results

	Dependent variable:			
	d_d_prod			
	(1)	(2)	(3)	(4)
d_loans_1	-0.243*		-0.029	
	(0.123)		(0.226)	
d_tax_audits_1		-435.385*		-209.173
		(225.292)		(239.838)
d_investment_1			-11.495	-11.673
			(19.494)	(19.185)
d_salary_1			-96.742	-98.072*
			(101.110)	(54.354)
d_emergency_1			-6,614.120*	-5,354.677
			(3,549.746)	(3,790.079)
Constant	-22,566.300	-116,609.400	69,663.790	21,166.780
	(128,825.500)	(138,019.200)	(146,519.600)	(145,059.500)
Observations	30	30	30	30
R^2	0.122	0.118	0.262	0.283
Adjusted R^2	0.091	0.086	0.144	0.169
F Statistic	3.889* (df = 1; 28)	3.735* (df = 1; 28)	2.218* (df = 4; 25)	2.470* (df = 4; 25)

Source: Own work using Gretl

As we can see from the columns (1) and (2) in the OLS regression results the past quarter changes in the amount of loans or in the number of tax audits have a weak statistically significant effect on the second difference of agricultural production. Intuitively, the reduction of a tax audits must accelerate the production, therefore, the result is in line with the intuition. The increase in loans given, in contrast, leads to the deceleration of the agricultural production. This result somehow contradicts the normal economic sense.

When controlling for the other variables, the government support variables become not statistically significant. Although, increase in salary (column 4) and increase in number of emergency cases (column 3) negatively affect the agricultural production which is logical.

Models above may be used for the reference, but definitely they are not much appropriate in the case of time series. The first reason is the autocorrelation of the series, and the second reason in the simultaneous causality between variables. Therefore, the application of VAR models can help. In order to keep the models simple, we estimate the following VAR model:

$$\Delta\Delta Prod_t = \beta_{10} + \beta_{11}\Delta\Delta Prod_{(t-1)} + \delta_{11}\Delta Support_{(t-1)} + U_{1t}$$

$$(10)$$

$$\Delta\Delta Prod_t = \beta_{20} + \beta_{21}\Delta\Delta Prod_{(t-1)} + \delta_{21}\Delta Support_{(t-1)} + U_{2t}$$

$$(11)$$

The gretl output for the VAR equations 10, 11 with 1 lag used is shown below:

Table 4. VAR Regression Results

	Dependent variable:			
	d_d_prod	d_loans	d_d_prod	d_tax_audits
	(1)	(2)	(3)	(4)
d_d_prod_1	-0.258	1.179***	-0.203	0.0003**
	(0.188)	(0.159)	(0.189)	(0.0001)
d_loans_1	-0.272**	-0.263**		
	(0.124)	(0.104)		
d_tax_audits_1			-474.342**	-0.347**
			(228.925)	(0.154)
Constant	-36,120.090	-70,287.550	-144,675.700	-290.028***
	(129,850.100)	(109,761.200)	(141,810.600)	(95.211)
Observations	29	29	29	29
R^2	0.191	0.718	0.176	0.276
Adjusted R^2	0.128	0.696	0.113	0.220
F Statistic (df = 2; 26)	3.061*	33.040***	2.778*	4.945**

Source: Own work using Gretl

From the column (1) we can see that the change in amount of loans in one quarter lead to the deceleration of production in the next quarter, and the effect is statistically significant. This result coincides with that of OLS regression from the previous table and seems surprising.

Column (2) of the table suggests that the lagged increase in production in one quarter leads to the increase of loans in the next quarter. This effect can be potentially explained in a way that agricultural firms have more resources to repay their loans and, therefore, increase their borrowings. On the other hand, increase borrowings in one quarter is followed by the decrease in borrowings in the next quarter.

Column (3) shows that the decrease in the number of tax audits leads to the acceleration of the agricultural production growth and the effect is statistically significant.

Column (4) suggests the negative autocorrelation of the number of tax audits (downward trend).

The previous models are applied on the stationary series of first or second differences of the variables of interest. Now we move our attention to the test of cointegration between the variables of interest.

We take two sets of variables:

1) prod, loans, investment, salary, emergency

2) prod, tax_audits, investment, salary, emergency

For each set of variables we run a Johansen cointegration test that helps to verify how many cointegrated variables are present in the chosen set. The results are displayed below:

Figure 24. Johansen Cointegration Test 1
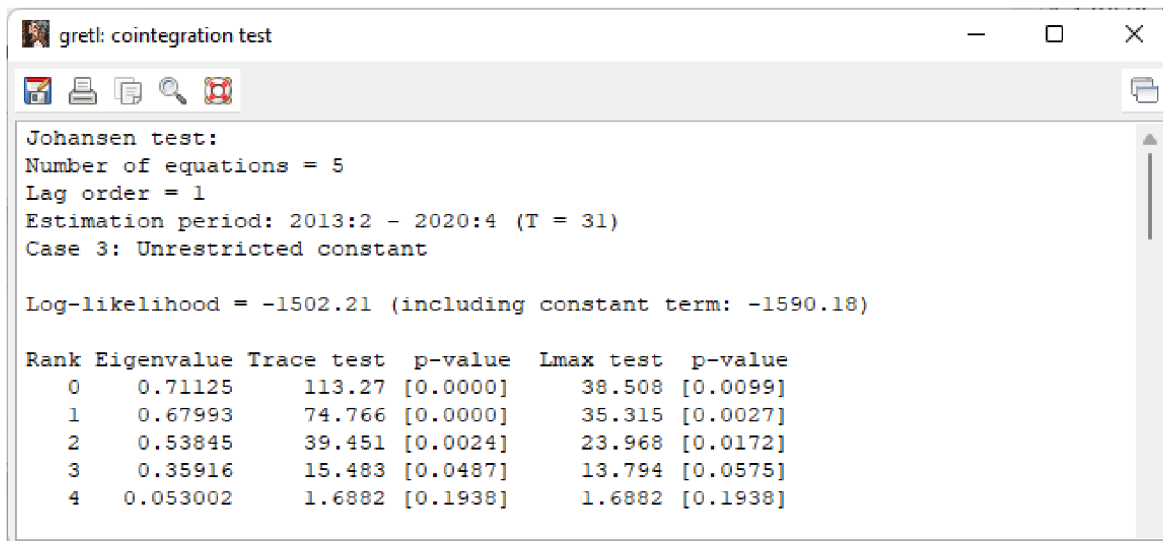
Source: Own work using Gretl

From the first set of variables, there are 4 cointegrated variables (the first non-significant eigenvalue with p = 0.1938).

Figure 25. Johansen Cointegration Test 2
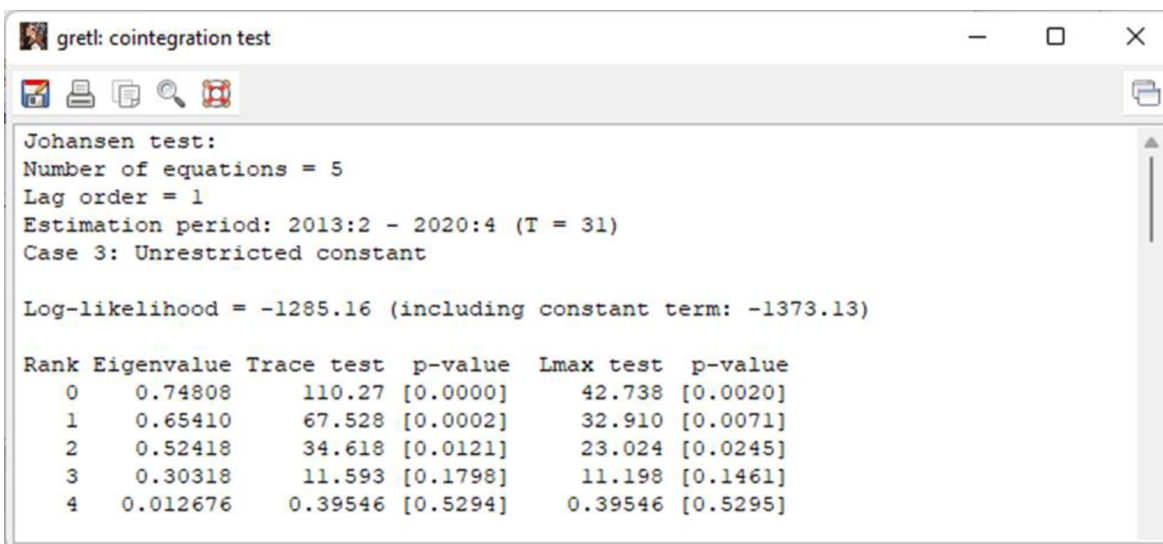
Source: Own work using Gretl

From the second set of variables, there are 3 cointegrated variables (the first non-significant eigenvalue with p = 0.1461).

Now we can estimate VECM models for the two sets of variables with the particular attention on the effect of the government support variables on the agricultural production. For each model we treat investment, salary and emergency as exogenous variables.

The estimation results of the first model are presented below:

Figure 26. VECM - Effect of the Government Support


```
gretl: VECM                                          —    □    ×

File  Edit  Tests  Save  Graphs  Analysis

VECM system, lag order 1
Maximum likelihood estimates, observations 2013:2-2020:4 (T = 31)
Cointegration rank = 1
Case 3: Unrestricted constant

beta (cointegrating vectors, standard errors in parentheses)

prod         1.0000
            (0.0000)
loans       -0.23313
            (0.050301)

alpha (adjustment vectors)

prod        -0.91737
loans        1.2971
```
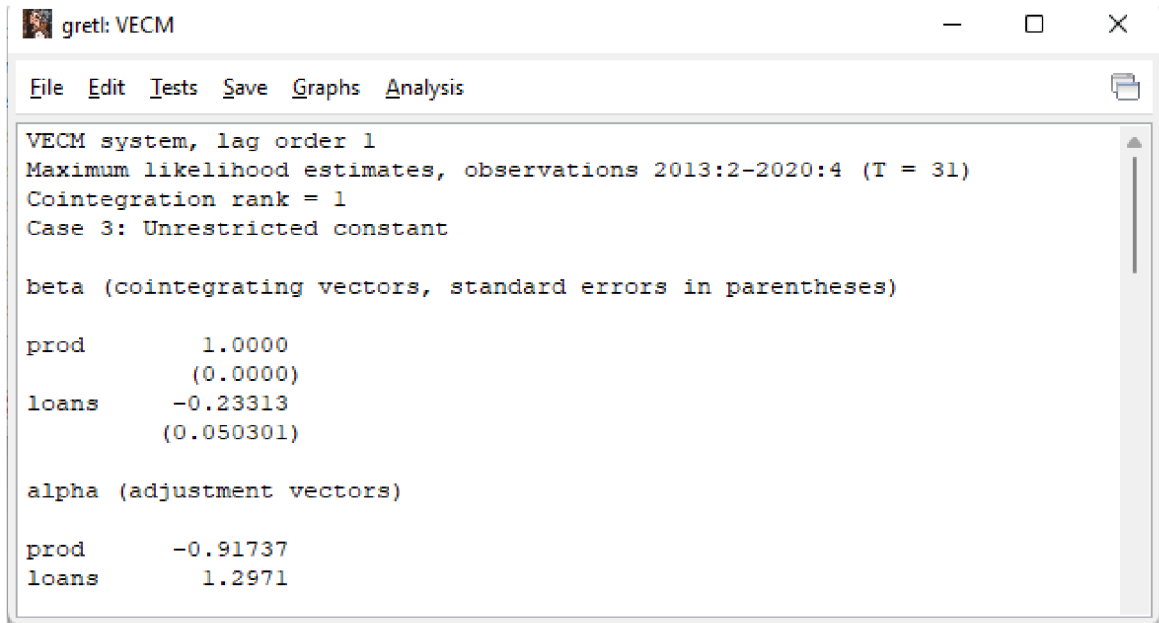
Source: Own work using Gretl

Figure 27. VECM – Equations 1

```
Equation 1: d_prod

                  coefficient      std. error     t-ratio    p-value
   -----------------------------------------------------------------
   const           -1.16105e+06    257944         -4.501     0.0001    ***
   investment       6.74104         10.4841        0.6430    0.5259
   salary          29.5275          10.1955        2.896     0.0076    ***
   emergency    11407.6           1977.71          5.768     4.49e-06  ***
   EC1             -0.917370         0.185145      -4.955     3.79e-05  ***

Mean dependent var    24635.33   S.D. dependent var    490869.7
Sum squared resid     2.05e+12   S.E. of regression    281056.0
R-squared             0.715878   Adjusted R-squared    0.672167
rho                   0.051447   Durbin-Watson         1.864743


Equation 2: d_loans

                  coefficient      std. error     t-ratio    p-value
   -----------------------------------------------------------------
   const           -736142         873950         -0.8423    0.4073
   investment        8.52914        35.5218        0.2401    0.8121
   salary          -38.7856         34.5440       -1.123     0.2718
   emergency     16376.3          6700.78          2.444     0.0216    **
   EC1               1.29706         0.627299       2.068     0.0488    **
```

Source: Own work using Gretl

First of all, the error term in the VECM model is (prod+0.2331×loans). Second, we see that the error correction term in the equation for *d_prod* has a negative sign and is statistically significant. This means that the increase in difference between agricultural production and loans

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to the agricultural sector has a negative impact on the change in agricultural production. More precisely, the increase in loans (and thus increase in the error term) leads to the decrease in the agricultural product. Therefore, VECM model shows the same relationship between government loans and agricultural production as other models used (OLS, VAR).

When using *tax_audit* variable as a proxy for the government support, we see that the error term is (prod+53.079×tax_audits). The coefficient on the error term is statistically significant and negative. Therefore, decrease in the number of tax audits is associated with the decrease in the error term and with the subsequent increase in the agricultural production.

Figure 28. VECM - Tax Audits

```
VECM system, lag order 1
Maximum likelihood estimates, observations 2013:2-2020:4 (T = 31)
Cointegration rank = 1
Case 3: Unrestricted constant

beta (cointegrating vectors, standard errors in parentheses)

prod              1.0000
                 (0.0000)
tax_audits       -53.079
                 (61.424)

alpha (adjustment vectors)

prod             -0.97626
tax_audits        0.00016466
```

Source: Own work using Gretl

Figure 29. VECM - Equations 2

```
Equation 1: d_prod

                coefficient      std. error      t-ratio    p-value
   ------------------------------------------------------------------
   const          -1.34972e+06    242200          -5.573     7.46e-06 ***
   investment      2.79870          9.48406         0.2951    0.7703
   salary         45.4641          10.7453          4.231     0.0003   ***
   emergency    8142.44          1903.87           4.277     0.0002   ***
   EC1            -0.976258         0.162624        -6.003    2.44e-06 ***

Mean dependent var    24635.33    S.D. dependent var    490869.7
Sum squared resid     1.67e+12    S.E. of regression    253703.9
R-squared             0.768488    Adjusted R-squared    0.732871
rho                   0.017917    Durbin-Watson         1.839141

Equation 2: d_tax_audits

                coefficient      std. error      t-ratio    p-value
   ------------------------------------------------------------------
   const         -1004.04          521.587         -1.925     0.0652  *
   investment       0.0115963        0.0204243      0.5678    0.5751
   salary           0.000427414      0.0231405      0.01847   0.9854
   emergency        9.74777          4.10006        2.377     0.0251  **
   EC1              0.000164664      0.000350216    0.4702    0.6421
```

Source: Own work using Gretl

   Overall, after estimation of the three different models we came to the conclusion that the volume of loans given to the agricultural firms is negatively associated with the gross value added of the agricultural sector in Russia. The effect is confirmed by OLS, VAR and VECM models.

   On the other hand, the relaxation of the bureaucratic procedures in the form of tax audits positively affects the volume of the agricultural production.

5. Results and Discussion

The research revealed that economic growth and economic development are closely linked despite the fact that these concepts exist separately from each other. The main difference between them is that economic development is a qualitative indicator, while economic growth is rather quantitative. This can be seen in the indicators that are used to evaluate them.

The indicators that are used to evaluate economic development include the following indicators:

1. Gross domestic product per capita
2. Consumption per capita
3. Human development index
4. The level and quality of life of the population (life expectancy, morbidity, education, social security, etc.)
5. Industrial progress
6. And other indicators

It can be noted that most of the indicators reflect precisely qualitative changes, which are often associated with the population of a particular territory. Unlike indicators that determine the level of economic development, indicators of economic growth are quantitative in nature. These indicators include:

1. Gross domestic product
2. Gross national product
3. The level of inflation
4. The level of employment and unemployment
5. Labor productivity
6. Liquidity indicators
7. And other indicators

Entrepreneurship has an important role both in the economic growth of States and in economic development. Business entities are the creators of a huge number of jobs, creates and sells various goods and services both at home countries and abroad. Business develops new technologies and encourages countries to develop. It is for this reason that governments of different countries have developed various measures to stimulate and develop business entities.

Many countries have common types of state support for entrepreneurship, the Russian Federation is no exception. These types of government support for business include:

1. Financial types of government support measures for business, which include the following subspecies of financial assistance to entrepreneurs:

    1.1. Subsidies for business development and support are a measure of financial support in which the state allocates funds (money) to business entities for their stabilization or development. In the Russian Federation, the amount of subsidies allocated to entrepreneurs in key sectors of the economy is determined by state programs for each calendar year. The amount of subsidies is determined at several levels: federal, regional and municipal levels.

    1.2. Loans on preferential terms provided to business entities – the government determines the banks that have the right to provide loans to businesses on preferential terms and provide a guarantee. The reduction of the interest rate on the loan is carried out due to partial coverage by the state of interest on loans granted to business entities.

    1.3. Investment support is a type of financial government support measure for business entities when the government, through the transfer of funds, property or the purchase of securities (shares, bonds and other types of securities), contributes to the development of companies.

    1.4. Grants are a type of state support in monetary terms, when the state grants special scholarships for the implementation of entrepreneurial activities free of charge (as a rule, based on the results of competitions). For example, for the implementation of new business projects or grants allocated by the state for the creation of any new technologies, as well as conducting scientific research.

    1.5. Creation of special tax regimes. This measure is one of the financial measures to support entrepreneurship, since states, when creating such regimes, determine preferential (reduced) tax rates. For example, this may concern a reduction in income tax or the abolition of value added tax. There are several special tax regimes in the Russian Federation, such as the simplified taxation regime and the professional income tax. The simplified taxation regime includes reduced income tax rates, in some cases the rates can be reduced to 1 percent (this applies to strategically important sectors of the economy), as well as simplified tax reporting, which significantly reduces the burden on business. The professional income tax is a tax for individuals who provide their services, sell goods or receive income from real estate. The amount of tax is from 4 to 6 percent, while

the citizen is not obliged to pay insurance premiums, provide declarations or other accounting documents.

2. Property support measures for business entities. Such measures include the provision by the government of land plots, buildings, equipment and other movable or immovable objects to business entities for ownership, gratuitous use, leasing or rent on preferential terms.

3. Informational, consulting, and educational measures of government support. In addition to financial and material support, the government can contribute to business development by providing information. Governments create institutions to which companies can apply to train their employees. Also, states are creating special platforms on which business representatives can get acquainted with the current legislation, state support measures that businesses can apply for and find out exactly what this will require, as well as, if desired, undergo special business trainings. Such platforms are also suitable for those who are just going to open their own business. Several similar platforms have already been created in the Russian Federation. For example, translated into English, this is the portal "My Business", where entrepreneurs and those who are just going to open their own business can get acquainted with important information for them, learn about the specifics of legislation, measures of state support and ways of obtaining them, as well as undergo training.

4. Legislative (regulatory) government support measure for business entities. This type of government support is expressed in securing at the legislative level the status of an entrepreneur, guarantees of the rights and freedoms that a business has in relation to its employees, property, cash and other assets. In addition to the above, it is at the legislative level that the government establishes all the previously described measures of government support measures for business, as well as more comprehensive documents, such as national, federal projects, state programs, and so on.

5. Reducing the bureaucratic burden on business entities deserves special attention. The essence of these government support measure is to reduce barriers to starting a business, that is, simplify registration processes, reduce the burden in terms of maintaining and reporting, and reduce the number of inspections conducted by state bodies (mainly on-site tax audits).

Regarding such an instrument as tax holidays, it can be concluded that tax holidays are also a government support measure. The meaning of tax holidays is to temporarily reduce the tax

burden on individuals and legal entities in order to reduce the level of negative consequences associated with various factors, such as economic sanctions and the economic crisis caused by the COVID-19 pandemic. The measure is also aimed at stimulating the development of important sectors of the economy from the point of view of the state and stimulating exports. Tax holidays are a deferral of tax payments, full or partial exemption from taxes for a certain period of time. Such taxes include corporate tax or corporate income tax. For example, individual entrepreneurs are exempt from paying taxes in the Russian Federation for the period of the first two years from the date of business registration.

During the analyzed period of time from 2012 to 2020, the Government of the Russian Federation has developed and implemented national and federal projects, as well as state programs aimed at developing, stimulating and supporting business in the country. These include:

1. The National Project "Small and medium-sized entrepreneurship and support for individual entrepreneurial initiative"

2. The Federal Project "Support for the self-employed"

3. The Federal Project "Creating conditions for an easy start and comfortable business"

4. The Federal Project "Acceleration of small and medium-sized businesses"

5. The Federal Project "Creation of a digital platform with a mechanism for targeted selection and the possibility of remote receipt of support measures and special services by SMEs and self-employed citizens"

6. The State Program for the development of agriculture and regulation of markets for agricultural products, raw materials, and food

7. The State Program "Economic development and innovative economy"

8. Programs of support and stimulation of business entities developed by the subjects of the Russian Federation, municipal public authorities, or authorities of cities of federal significance (Moscow, St. Petersburg and Sevastopol). These programs are subordinate to projects and programs at the national and federal levels. Their main task is to independently distribute funds from the federal budget to support those sectors of the economy that are the most priority on the territory of individual subjects, municipalities or cities of federal significance.

As mentioned earlier, these national, federal, regional, and municipal projects and programs have been developed by governments at various levels to increase the attractiveness of business within the country, its development, stimulation and support. It is interesting to note that microbusiness in Russia has several forms: individual entrepreneurs, microenterprises with fewer

than 15 employees and self-employed citizens. There is a special tax regime for self-employed citizens, which, from my point of view, has quite attractive conditions for doing business (low tax rates, the ability not to pay contributions to pension, social and health insurance funds, a simplified procedure for registering as self-employed and very simple rules for registering income and paying taxes), as well as a separate federal project.

In the practical part of the thesis, I conducted a statistical and econometric analysis of the effect of government support measures for business entities on the economy of the Russian Federation.

Based on the results of statistical analysis of general economic indicators, economic indicators of the agricultural sector and the technology and innovation sector in the Russian Federation, I came to the conclusion that the impact of state support measures for small and medium-sized enterprises did not play an important role in stimulating and developing business in Russia over the analyzed period of time. The graphs and tables presented in the practical part clearly show that the volume of government measures to support business is extremely small, and, as a result, due to its very small volumes, it cannot demonstrate positive dynamics in the development of the economy of the Russian Federation, or the changes are extremely insignificant. However, in the course of statistical analysis, it was possible to observe other dynamics – sharp fluctuations in the set of analyzed indicators, most of which were noted in the period from 2014 to 2015, as a consequence of the introduction of economic sanctions against the Russian Federation. At the same time, the fluctuations were mostly negative. The positive changes that related to the technology and innovation sector were not related to measures of state support and incentives, but to changes in calculation methods, information about which could not be found during the study. However, a change in the calculation methodology was noted during the collection of data for analysis in official government sources.

An econometric analysis of one of the strategically important economic sectors of the Russian Federation, agriculture, was also carried out. The analysis was conducted on the basis of data obtained from official sources, such as the Central Bank of the Russian Federation, the Federal State Statistics Service and the Ministry of Agriculture of the Russian Federation.

Two types were chosen as measures of government support for the econometric analysis of agriculture: the volume of preferential loans in monetary terms in national currency and the number of on-site tax audits. The Gross Value Added in basic prices by category agriculture, in millions of rubles, was chosen as an indicator reflecting economic growth in the field of agriculture.

According to the results of the analysis using ordinary least squares model, vector autoregression model and vector error correction model, it was found that the volume of concessional loans issued to small and medium-sized businesses in the agricultural sector, contrary to personal expectations, is negative. For example, according to the results of the OLS regression, it was revealed that changes in the volume of concessional loans issued or the number of on-site tax audits have a weak statistically significant effect on changes in agricultural production. As expected, the reduction in the number of on-site tax inspections should have accelerated production, the result was in line with expectations. However, the increase in the volume of concessional loans issued, on the contrary, led to a slowdown in agricultural production.

Thus, it can be concluded that not all measures of state support that are implemented in the Russian Federation are effective. Some of the other measures, such as subsidies and investments in fixed assets, cannot be fully evaluated due to their extremely small volumes. This, in turn, suggests that the state is not using its opportunities to stimulate the economy to the full.

In conclusion of this chapter, I would like to add that the state bodies responsible for developing measures of government support for business entities in the Russian Federation should conduct a careful analysis of the effects of these measures on the country's economy and develop more effective measures to achieve a better result than what we could observe during the analyzed period.

6. Conclusion

Based on the results of the study, we can conclude that those national, federal projects, state programs and programs of the subjects of the Russian Federation that contain measures of state support for small and medium-sized businesses implemented by the Russian Federation do not have the proper effect on the economic growth and economic development of the country.

Destabilizing factors such as economic sanctions imposed by the European Union, the United States of America and other countries against the Russian Federation in 2014 and the COVID-19 coronavirus pandemic in 2020 had a much greater effect on the Russian economy.

The low efficiency of government support measures for small and medium-sized businesses over the analyzed period of time in the period from 2012 to 2020 is primarily due to the volume of state support measures. For example, it can be noted that the volume of government investments in fixed assets of business entities whose main activity is agriculture for the analyzed period ranged from 1.7 percent to 3.4 percent of the total investment in fixed assets. The share of government participation did not grow gradually, it changed throughout the entire period of time, at first glance, rather chaotically. At the same time, in the same period of time, the volume of investments in fixed assets has been constantly growing, with the exception of 2015, when, after the introduction of economic sanctions, the volume of investments in agriculture decreased by 3.1 percent compared to the previous year.

If we talk about the technology and innovation sector in the Russian Federation, the impact of government support measures has not had much impact here either. At the beginning of the analyzed segment, the share of high-tech and knowledge-intensive industries in the gross domestic product of the Russian Federation was 20.2 percent, whereas seven years later in 2019, this figure was 22.2 percent, which is only 2 percent higher than in 2012.

Econometric analysis also confirmed the results of statistical analysis. In accordance with the results obtained, it was found that there is a link between economic growth and government measures to support business in the field of agriculture, but this link is very weak. It was also found that one of the measures of state support – concessional lending - had a negative impact on the volume of agricultural products, unlike other, non-financial

measures of state support. The decrease in the number of on-site tax inspections had a positive effect on the volume of agricultural output.

The total share of all small and medium-sized businesses in the gross domestic product of the Russian Federation, taking into account all government stimulus measures, remains at a very low level. So, in 2012, the share of SMEs in Russia's GDP was 19.2 percent, and in 2019, before the pandemic, the share increased to 20.7 percent with an insignificant change of 1.5 percent over seven years. While in developed countries, the share of small and medium-sized enterprises in the country's gross domestic product exceeds 50 percent, Russia still lags far behind in this indicator.

Answering the main question of the study, we can conclude that there is indeed a connection between government measures to support business economic growth and the development of the country, but this connection is very weak.

In 2022, the Government of the Russian Federation announced new programs and measures of government support for business. This is a topic for a new research, but we will hope that the measures that were proposed in 2022 will be more effective than those considered in this research.

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Appendix

Appendix A. Data for econometric analysis of the agricultural sector of the Russian economy

Appendix A. Data for econometric analysis of the agricultural sector of the Russian economy

		Gross Value Added in basic prices by category agriculture, in millions of rubles	Volume of loans to businesses and individual entrepreneurs in the agricultural sector, millions of rubles	The number of on-site tax audits of organizations carried out, units	Direct investments in Russia by type of economic activity (agriculture), millions of rubles	Availability of serviceable agricultural machinery (tractors) in agricultural organizations,units	Average monthly salary of agricultural employees, rubles	Number of emergency situations on the territory of the Russian Federation, units
2013	I	188396,90	234959,00	8649,00	8927,64397	402787,00	14030,00	53
	II	325001,00	771375,00	9029,00	4750,38032	437671,00	15824,00	98
	III	872215,10	1266708,00	7594,00	1050,26370	438549,00	16145,00	136
	IV	613107,20	1724916,00	7924,00	4660,24780	386278,00	18536,00	48
2014	I	192664,00	224446,00	7468,00	-1849,55400	397444,00	15849,10	64
	II	330473,80	681227,00	7739,00	5190,41660	403840,00	17366,50	74
	III	944307,90	1087155,00	7322,00	1404,14580	423821,00	18954,40	78
	IV	570304,20	1548219,00	6929,00	-7713,64960	364291,00	20871,10	46
2015	I	196632,80	180170,00	6250,00	1739,23680	406241,00	19826,90	50
	II	334793,60	611962,00	6607,00	7495,03830	431726,00	21358,30	65
	III	962988,60	1146216,00	6896,00	-558,73650	428584,00	23295,70	86
	IV	595851,30	1718603,00	6439,00	7178,08140	383270,00	25361,20	56
2016	I	208294,00	315689,00	6064,00	491,54810	396788,00	22075,80	50
	II	348491,60	900793,00	5748,00	-5195,29680	426321,00	23820,40	88
	III	986126,30	1494884,00	5550,00	3243,92400	418406,00	25096,70	99
	IV	613401,80	2866297,00	5232,00	-7470,64150	380757,00	28144,70	62
2017	I	416183,80	368940,00	4854,00	-8375,13210	364286,00	24544,30	36
	II	592654,70	1091793,00	4415,00	-13683,88720	348237,00	25747,48	70
	III	1436235,90	1679468,00	4247,00	1106,25000	411806,00	28064,03	82
	IV	891866,70	2499927,00	4045,00	5227,11090	417598,00	30134,00	69
2018	I	431486,90	368204,00	3671,00	361,12450	397751,00	26132,76	51
	II	615405,30	1205948,00	3094,00	637,46640	424035,00	28908,42	59
	III	1406834,90	1898469,00	2911,00	3529,67880	423021,00	30681,31	90
	IV	940194,70	2977853,00	2873,00	-846,19365	373098,00	33157,29	66
2019	I	435879,50	291181,00	2375,00	416,46402	383196,00	29048,48	39
	II	624189,40	257989,00	2026,00	3423,18195	404412,00	32086,68	60
	III	1464158,60	254200,00	1933,00	2131,15531	405349,00	34281,12	95
	IV	986930,70	326435,00	1909,00	-7322,81092	364201,00	36735,71	72
2020	I	444567,90	322793,00	1378,00	1102,37786	386351,00	32581,20	61
	II	631378,80	264836,00	159,00	3297,96788	405490,00	34860,70	38
	III	1489864,80	224225,00	2163,00	1798,42220	407823,00	36549,00	154
	IV	952092,10	223510,00	1770,00	3630,55388	373048,00	40755,90	78