

# Social, economic & technological changes in new global architecture: trends and solutions

Под редакцией  
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# **SOCIAL, ECONOMIC & TECHNOLOGICAL CHANGES IN NEW GLOBAL ARCHITECTURE: TRENDS AND SOLUTIONS**

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X Международной студенческой  
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*Под редакцией Л.В. Кулик*

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## **Potential threats of post-pandemic future and ways to combat them**

**Abstract.** The global economy suffered a serious blow in 2020 comparable to the Great Depression of the 1930s. As a result, fears of aggravation of the so-called “secular stagnation” in the world economy have grown among economists. By analyzing the strengths and weaknesses of the EU and US economies, the research shows that the unprecedented support measures taken during the crisis led to the growth of already indebted countries’ debt to alarming proportions. The findings of the study provide a set of policies that might halt the persistent increase in inequality and overcome the crisis situation.

**Keywords:** fiscal policy, secular stagnation, interest rate, corporate debt, coronavirus.

### **Introduction**

The investigation deals with the nature of the crisis situation and potential threats for the post-pandemic future. We begin our study with the analysis of the crisis and post-crisis factors, including the aftermath of the pandemic, the problem of debt, low interest rates and consumer “trauma”, that lead to the so-called secular stagnation. To find the ways to combat them, we identify the necessary prerequisites for developing policy measures. The paper also analyzes the problem of the government and corporate debt restructuring. Finally, we consider steps to avoid secular stagnation.

### **The crisis and post-crisis factors**

The main factors shaping the crisis problems in the past year are the coronavirus and the consequences of twelve years of secular stagnation. This idea was confirmed by experts and scientists from different countries [8, pp. 7–14]. This is a global crisis: The United States and the leading European countries estimated their spending on overcoming the crisis at 15–20% of GDP. In these states, this is the first time since the Great Depression, and for the UK — the first time in 300 years.

The US anti-crisis measures are not evaluated as effective. The United States is pursuing a wartime financial policy. Its public debt reached 135% of GDP in 2020. The last time the US had such a national debt was in 1946. The American strategy to overcome the crisis will entail certain problems that can only deepen the recession. Excessive emission of money at record low interest rates risks leading to financial bubbles and a slow surge in inflation, which is already being observed [6, p. 8].

While the decline in Russia's GDP in 2020, according to the estimate of the Federal State Statistics Service, was 3.1%, the real disposable income fell by 3.5%, the state budget decreased by 1.1 times, the financial results of enterprises fell by almost a quarter — the number of poor people in the country dropped to 17.8 million, which indicates the success of the support measures taken during the crisis.

The crisis of 2020–2021 is not a standard financial and economic crisis, like the Asian crisis of 1997–1998; nor is it the Great Depression. This is the so-called external crisis associated with external circumstances, in this case, a pandemic.

The pandemic has also made its own adjustments. It has provided Russia with a unique opportunity to move immediately to socio-economic growth, rather than return to stagnation after the crisis. Stagnation does not translate into economic growth, for this reason it must be overcome. An attempt to resume work and compensate for the loss of income during the pandemic in production will help to overcome the state of stagnation. The main drivers of growth are investment in fixed assets and investment in the knowledge economy, that is, in human capital.

Some scientists note the excessive issue of money, which may have grave consequences. But according to the index of sovereign financial stability for groups of emerging market countries, currently Russia ranks first in terms of financial stability. According to these indicators, Kazakhstan, Israel, and Poland are close to Russia. South Africa, Ukraine and Turkey are in the last place. Neither the deficit nor the banking panic in the Russian banking sector threaten the Russian economy at the moment. The three support packages for the social sector and the economy are estimated at 4.1% of GDP and are not critical for the stability of the financial sector.

As a measure, it is proposed to regulate the work of the Central Bank. The central Bank tightened the terms of lending to citizens and raised certain interest rates. In this context it is necessary to make the Central Bank a bank for social and economic development, as well as to focus the banking system, together with government measures, on solving social and economic problems [12, pp. 9–10].

According to some forecasts, immediately after the pandemic, people will see the functioning of the economy in a completely different way. The pandemic has revealed major structural changes in all three elements of the economy: production, sales, and consumption. The main features are the transition to the use of remote technologies (including remote work, online shopping, etc.); trading platforms that sell not only specific goods, but also carry out complex sales that connect the seller and the buyer on the Internet, which has led to a significant increase in the number of logistics centers. Active development of technologies in 3D printing, prolonged stay of the citizens in the country, and reducing the number of employees at their job places — all these have also contributed to a completely different vision of the economy.

Economic downturns “scar” consumers in the long run. We find a robust effect of both personal unemployment experiences and exposure to unemployment rates on consumption expenditures, controlling for financial constraints, income, wealth, and demographics. What channel drives the effect of past experiences on consumption? We find that individuals, who have lived through worse times, consider their own financial future to be less rosy and times to be generally bad for spending on durables, controlling for all historical data, current unemployment, and other macro conditions. Leslie Sheng Shen highlights that the economic conditions individuals have experienced in the past have a lingering effect on their beliefs about the future, giving rise to experience-based learning [9, pp. 55–57].

We are concerned that consumers’ reduction in consumption and their pessimism could reflect (unobserved) determinants of households’ future income that are correlated with past unemployment experiences. In other words, while past experiences of unemployment exert a strong influence on beliefs about the future and on consumption expenditures, actual future income does not explain these adjustments. Ulrike Malmendier notes that, if consumers become more frugal in their spending after negative past experiences, even though they do not earn a reduced income, “we would expect their savings and ultimately their wealth to increase” [9, p. 3].

## **Government and corporate debt restructuring**

Another serious threat is the government and corporate debt problem. The debt has been building up over the past decades that has been supported by the government and central banks measures. Although the corporate debt proved to be a big problem at one point, no adequate measures were taken by firms to improve the situation.



In addition, the coronavirus has brought about serious financial instability. The corporate debt was manifested in overloaded balance sheets. Instead of encouraging moderation, central bankers and policymakers are creating the conditions for the debt to rise. The European Central Bank and the Bank of Japan have been buying corporate bonds, and central banks have continued to fund at zero rates, which has contributed to massive debt growth over the past decade.

Central banks have long promoted high corporate leverage because they see it as a way to stimulate demand. Even now, many economists do not see problems on the horizon. But while the debt has stimulated growth, it has also led to much greater financial instability, and so growth is fundamentally untenable. Anatolijs Prohorovs notes that, less debt, rather than lower rates, is better for financial stability [10, p. 8].

According to FactSet, 17% of the world's 45,000 public companies have not generated enough cash to cover interest costs at least in the past three years. The debt was used to finance more. The Bank for International Settlements has studied similar economic indicators around the world and found that the proportion of companies that earn too little even to pay interest on their debts, and survive only by issuing new debt, is now more than 12%, compared with 4% in the mid-1990s.

According to the IMF, a recession only half as severe as in 2008 would put \$ 19 trillion in debt — almost 40% of corporate borrowing in large countries — at risk of default. The economic consequences will be appalling. Corporate debt has doubled in the decade since the financial crisis, and non-financial companies now owe a record \$ 9.6 trillion in the United States. Worldwide, companies have issued \$ 13 trillion in bonds.

But instead, companies are resorting to a more reckless strategy: borrowing to buy back shares. This may increase their Return on Equity (ROE), but it is not even remotely reasonable and makes their companies very vulnerable. Borrowing to support their own stocks means they will have less on hand when times get tough.

## **Secular stagnation as a threat**

As part of the spring 2019 issue of the Brookings Papers on Economic Activity, Larry Summers and Lukasz Rachel published articles on the fall in neutral real rates, fiscal policy, and the risk of secular stagnation [13]. The article estimates the natural interest rate, that is, the interest rate corresponding to balanced savings and investments, for all developed economies. They found that this figure has fallen by three percentage points in the last generation and

could have fallen by as much as seven percentage points if not for government spending. The novelty of the assessment method is that it considers developed economies as a single economic entity that is fully integrated and operates as a closed economy [7, p. 2].

Low rates, despite a decade of large deficits and debt, are due to the private sector. The crux of the problem is that private investment is not enough to absorb all private savings at normal interest rates. The result is extremely low interest rates, weak demand, low growth and inflation, and higher prices for existing capital assets. Laurence Ball notes that the consequence is that the significant increase in the public debt we have seen in recent decades is not so much a consequence of fiscal irresponsibility as a reaction to the scarcity of private investment compared to private savings [1, pp. 2–3].

One consequence of a negative neutral real rate is the possibility that the policy will fail to bring the economy to full employment, even in the long run. Lawrence Ball shows a satisfactory growth may, given the current structure of the economy, depend on unstable policy settings [2, p. 20]. The range of policy options is also narrowing in the face of recession. Indeed, as Brad DeLong put it, a small negative shock cutting this rate just a little bit more will drive the economy into territory where the central bank cannot do its job [4, p. 23].

## **Problem resolution or how to combat the problems**

To find the tools for problem resolution, we need to define the prerequisites. Two different sets of policies are most relevant and important. On the one hand, the asymmetric responses of the central and peripheral eurozone countries to the general shocks are rooted in long-term differences in technological capabilities. It is crucial to first reduce the technological gap between the core and the periphery, through long-term industrial policies. On the other hand, European policymakers should look better at reforms ensuring a homogeneous macroeconomic environment across the eurozone and avoid the impact of severe financial shocks on the periphery [5, pp. 33–34]. It is necessary to complete the creation of the eurozone banking union and create a central financial authority. Alberto Botta shows that such macro-reforms, along with industrial policies aimed at the persistent technological gap between the core and the periphery of the euro zone, are the only reliable responses to the centrifugal forces (and subsequent uneven development), which had been normal before 2008 but were awakened by the financial crisis [3, p. 20].

The reforms in the euro area should be aimed at bridging the technological gap between the core and the periphery through industrial policies and creating

a homogeneous financial and macroeconomic environment between member countries, rather than at overall deregulation of labor markets [3, p. 19].

As for the government and corporate debt restructuring or the spheres to focus on, to effectively restructure the government and corporate debt policymakers should address three basic drawbacks. They are financial instability caused by political intervention, inconsistent priorities (investments returns and structural changes needed), and ineffective use of funds. One of the principles of good governance is stability, which can take the form of financial stability beyond the duration of political intervention.

In determining funding priorities, the focus should be on investments that can bring significant returns in the medium and long term, as well as structural changes in line with current trends in global economic development. This means that financial resources should be directed primarily to develop an innovative or knowledge-based economy and to improve the quality of human capital. With the absence of this, it will be impossible to implement such structural changes, as well as to improve the competitiveness of successful companies with a high share of exports. The choice of the above-mentioned funding priorities when planning the recovery of the economy affected by the COVID-19 pandemic will ensure that national economies increase their international competitiveness, stable development, and prosperity in the medium and long term.

Of greatest concern is the financing scenario, in which most of the funds received, will not be used effectively enough and will be spent on solving short-term tasks, for example, on the construction or reconstruction of facilities that are not of vital importance to the population. This, of course, would have a certain positive effect in the coming years, but in the medium and long term it would limit the growth of the competitiveness and stability of the national economy too much [10, p. 6]. It also requires a long-term solution to bankruptcy problems in court. Laura Voda notes that accelerating bankruptcy cases is especially relevant for the European economy [14, p. 3].

The steps that can help to avoid secular stagnation were worked out by prominent economists of our time (Summers, Stiglitz, Wolf, Sandbu, Leonhardt, Limberg, and others). Thus, Lawrence Summers claims that the forces of the private sector driving down interest rates are more powerful than previously thought, and therefore a much lower equilibrium interest rate may be required in the coming years for savings and investment to be balanced and for the economy to be fully engaged [9, pp. 7–8]. Joseph Stiglitz speaks about stabilization, combating monopolies, promoting a more equal distribution of income, and strengthening pension provision [11, p. 2].

Martin Wolf talks about the need for more policy tools, starting with fiscal policy. In his opinion, one of the ways to effectively use the “public deficit”

would be to use public investment both to compensate for the lack of private investment and to stimulate it [10, p. 9]. With 10-year US Treasury yields around 3%, the US economy is far from reaching the bottom line, leaving some room for more unconventional policies, such as direct targeting of long-term interest rates [6, pp. 6–7].

Some scholars stress the need for new solutions after a decade of economic surprises, although policymakers should be wary of how expansionary fiscal policies are conducted. Leonhardt calls Trump's 2017 tax law an example of how fiscal policy can only give a fleeting boost to the economy. Growth of 2.9% in 2018 on the back of temporary tax cuts was short-lived, as evidenced by the slowdown in growth in the first quarter of 2019 [11, p. 3]. Finally, Julian Limberg notes that tax cuts should be aimed at the population, not rich society [8, p. 10].

## Conclusions for Economic Policy

To sum up the research, the first conclusion concerns the adjustments, which the coronavirus has brought about. These adjustments mainly focus on socio-economic growth. The next conclusion singles out investment in fixed assets and human capital as the most powerful triggers of growth. Another very important conclusion states that emission is not a remedy for economic growth. Next, secular stagnation as a plaque of our century must be avoided at any cost. And the last conclusion mentions three measures: manageable public deficit, long-term interest rates and realistic tax cuts designed to cure the economy.

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## **3D-Bioprinting in medical industry: evidence from advanced economies**

**Abstract.** The aim of the project is to increase the awareness of medical applications of 3D printing and bioprinting and to show its multifaceted application. The authors provide an extensive overview of the current trends in the industry of medical 3D printing. In addition, they present the evidence of most impressive achievements in this sphere. The researchers use the systematic method and comparative analysis of medical 3D-bioprinting in advanced economies. The findings might influence the pace of the world economy development.

**Keywords:** medical equipment, innovation, 3D-bioprinting, 3D-printing, technology

At present, the humanity has achieved such heights in health care that ancient people could never dream of. However, some fields, like non-prosthetic limb replacement, and illnesses that require transplantation, require new scientific breakthroughs. There is also a problem of lack of donor supply, which often doesn't meet demand. The answers for these problems are currently being researched, with one of the most prominent solutions being 3D bioprinting, the process of tissues and organs creation from biological material. This sector of innovative technologies has attracted attention because it can help to improve both life expectancy and quality of life. Common 3D printing technology also has applications in medicine, from printing instruments and machine parts to dental prosthetics, bone replacement implants and precise surgical models [8]. All in all, the sphere of medical 3D printing is vast. We think that this research project can be interesting for both people who are knowledgeable in the field, and those who have not yet heard of these innovative technologies.

In this paper we provide an overview of the industry, attempt a comparative analysis of the countries that have achieved some success in this sector (namely

Russia, Israel and the USA), review the possible ways to improve the industry in Russia through attracting foreign investment and consider the possible future possibilities and prospects for this field.

First of all, we will overview the use of 3D-printers nowadays, which are becoming more popular every day. Scientists aim to use technologies of 3D printing in categories like 3D bioprinting of organs, 3D bioprinting of tissues, food bioprinting and possibly the improvement of immune system and body [3, pp. 106–115]. These inventions can change not only everyday life, but some of the economic aspects. For instance, first companies to achieve success in them are going to receive biggest profits. The aim of many modern pharmaceutical companies is to use these technologies in their production.

3D bioprinting of organs is currently developing. The possibility of implanting new strong and healthy organs to animals or humans is becoming closer every day, but currently it is mostly in the starting stages of development, with current testing being done only on plants and animals. The process of 3d bioprinting is achieved through putting healthy donor cells from animals, animal organs or tissue in special environment of 3D-biogel inside of sterile laboratory. The cells are later being arranged in the proper shape, and new cells are added from the older duplicates with the help of bioprinter. One of the biggest questions currently is how the new organ can be connected to the body, but through the use of special nerve chip it is possible to connect it to the host body and brain.

Bioprinting can make many types of medicine obsolete, since healthy replaced organs will maintain good performance. As a result, main pharmaceutical companies will possibly need to change their process of production and implement new technologies. To sum it up, 3D-bioprinting is a modern and perspective sphere, that can change local pharmaceutical markets and create new field of competition, while also finding answers to many issues and improving people's health and lives.

Another promising technology is 3d-bioprinting of tissues, that can help with recovery after skin damage, cosmetology, and rejuvenating procedures. The process is similar to bioprinting of organs, but it is necessary to arrange tissue layers properly from different types of cells, which are taken from the donor [1, pp. 9–19].

Production of food using 3D-bioprinting is also possible since the cells can be used to produce meat without killing of animals. This has the potential to help with the lack of food, although the cost of producing such meat is currently too high. Some competition on the market can reduce the price of such food, which would make it more cost efficient.

Finally, there is a possibility of improving the organism through bioprinting. Since cells can be potentially implanted into any part the body, it is

theoretically possible to increase the power of limbs or improve the immune system by producing additional cells. If such technology were created, it could even be used in military programs.

Such potential for possible applications makes this technology sought after by both prominent companies and start-ups. In our paper we have compared the presence of 3D-bioprinting technology in three different countries: the USA, Israel and Russia. Currently all of them have different foothold on the market. In the USA and Israel, the technology is already highly developed and distributed, while Russia is an emerging market economy with high potential.

The global bioprinting market is expected to grow substantially in the coming years. With a \$651.6 million estimate in 2019, the 2024 forecast predicts an industry growth to \$1.64 billion. More detailed current and future market volumes in different regions are represented in our source [6]. North America was responsible for the major part of the revenue and will continue dominating in the near future. The other parts of the world, especially Asia Pacific, also continue to expand their markets. The Middle East represents a small part, but Israel can boast of some crucial breakthroughs in the industry, which is why the usage of this country in the comparative analysis makes sense.

We have analyzed some prominent companies in each country mentioned above. The company “Organovo” from California works in the field of functional human tissues creation, sells bioprinters and claim to have developed a computer model of the human liver, and printed prototypes of the liver. Their performance dynamics is on the rise, and they approach patenting very seriously. In December 2010 “Organovo” created first blood vessels and nerve fibers by using cells from a single donor [4, pp. 3–9].

Israel is on the cutting edge of this new technology due to robust innovation environment. By some estimates, Israel manufactures about 40% of all 3D printers worldwide. The group of Israeli doctors grew a part of bone which was later successfully hardened and merged with the existing one and other Israeli scientists have created a 3D printed rabbit size heart, which has all needed arteries and veins. In addition, an advanced center for 3D-bioprinting was founded by the Israel Institute of Technology [7].

Russia currently has quite insignificant position on the market, but according to some studies, it will be able to become market challenger in the future. The only company developing bioprinting technology and bio inks for commercial use in Russia is called 3D Bioprinting Solutions, which became one of the contenders in Europe. In 2018 3D bioprinter was sent to space orbit by this company, Roskosmos and Invitro (which makes it joint state and private initiative), where a small amount of living tissue was successfully printed in the state of zero-gravity.



Russian scientists have created first national bioprinter called “Fabion”, and the thyroid gland was printed and successfully implanted in laboratory mice with its use. In addition, Russia manufactures different parts in high volume that are used in 3D bioprinters around the world. It is worth mentioning, however, that current Russian legislation concerning organ transplantation needs proper adjustments since the existing one is overcomplicated. In addition, the Federal budget of Russia has no state funds to develop 3D bioprinting technology, only incentives for businesses to develop this direction at their own risk. Because of these factors, the industry of bioprinting in Russia has some controversies, but also strong prospects for the development in future and great potential in human capital for it [5].

Our comparative analysis shows that differences in national markets may decrease in future, since the observed countries have large market sizes and availability of highly skilled labor force. However further development requires heavy investing.

To analyze the potential for this possibility in Russia we have reviewed the potential possibilities for the development of this industry. The competitive market for this industry has not yet formed, but some of the products like bio inks or 3D-printed prosthetics are already used. Unfortunately, with only one bioprinting company Russia has to catch up with some other countries, which have achieved more progress. Innovative technologies are currently not a very popular business path despite the state support programs, because they are considered risky ventures. Small businesses and innovation startups at the moment perform poorly in current economic conditions and legal background. That is why we intend to consider foreign investment as a financing tool, since it can make the industry more competitive at international level and develop the market by attracting resources, like intellectual property and qualified workforce, from abroad.

The analysis of medical equipment market, that is the closest representative for potential bioprinting market, shows that Russian market is considered attractive for foreign companies, even despite some issues. To date a large part of the market is import from foreign manufacturers since many medical facilities currently prefer to purchase equipment from abroad. The market is expected to grow due to aging population, and some experts forecast that the import is going to increase as well. However, the Ministry of Industry of Russia planned to reduce the dependence on foreign manufacturers, and this can restrict access for some foreign suppliers. Some innovative devices do not currently have analogues on local market, so it is impossible to stop their import until these analogues appear [11].

The investment climate in Russia is not very optimal, partly due to negative image in foreign mass media. Foreign investors have to abide with

multiple sanctions which are in effect in Russia. American investment climate report about Russia also states that there are other negative factors on the market such as corruption and biased judicial system [2]. To date the flow of foreign investment into Russia is low, brings about a small percentage of GDP and continues to decrease, despite the market attractiveness, and major part of them could be Russian reinvested profits from offshore jurisdictions [12, pp. 170–181].

There are different ways and incentives to invest in Russian market for foreign companies. Some are common, like opening subsidiaries or investing in company stocks, but others are more interesting, like state funds and innovation support systems, that can help startups. The preferences exist for investors investing in sectors that are in demand by government, like special investment contracts and tax incentives for long-term investment. There are special areas with favorable conditions for investment, named Priority Social and Economic Development Areas that have varying advantages [9]. Foreign investment was used historically by some countries to increase their technological level and profit from it. One of the most famous ones is China, where the enterprises supported by foreign investment have contributed a lot to the economic growth and development, and technological transfer has greatly improved technological level of the country.

Another example of a country that has benefited from foreign investment is Vietnam, which has also implemented the policy of attracting it. Technology transfers and spillovers sometimes provide positive externalities that reach further than the industry in question, like in Vietnam. These examples are cases of success, but it is also important to remember that the approach needs to take the specifics of the country into consideration. There also are some issues to look out for, like long-term capital outflow from the country, disruption of local industry by pulling workforce to foreign projects, and a possibility of foreign agents taking over small local companies and getting too much control over the local industry.

In our opinion, one of the best ways to overcome access restrictions for foreign companies is to set up local production facilities. Creating subsidiaries or working on joint projects with local companies is a popular way to access foreign markets by transnational companies. For example, 3D Bioprinting Solutions is a wholly owned subsidiary of VIVAX BIO, a biotech company based out of New York focusing on 3D bioprinting [5]. Such approach can help with getting important intellectual property and qualified workforce for the field of medical 3D printing.

We think that in addition to economic potential, it is also important to consider potential applications of innovative bioprinting technologies in the future and to improve its availability to the public. 3D-bioprinting is an extremely

important piece of innovation for humanity that has a lot of potential for improving quality of life.

Normal 3D-printing is used in medicine to produce highly accurate, durable and customizable instruments and biocompatible parts, like bone replacements. Instruments and parts created this way are used in surgical planning, in the creation of anatomical and surgical models, artificial and prosthetic devices, drugs, bio- and medical implants. Meanwhile, 3D-bioprinting technologies are being developed with the aim of creating bioengineered blood vessels, tissues, and prosthetics. Medical 3d printing can be cheaper than prosthetics or dental implants, which makes it more accessible to the wider population [8].

The undertaken analysis highlights to what extent 3D-printing can change the world. It can provide highly personalized, patient-specific treatments. We can state with a degree of certainty that medical 3D-printing will be the driver of future in medicine. Scientists are already bioprinting organoids, which are basically copies of the organs that can be used for practice and research. While a complete organ is a far-off future, the development of biological tissue, which could replace or repair an organ, is the next step. Bioprinting can unlock the way to cure illnesses, which are now deemed impossible to cure. In addition, medical bioprinting could lead to a breakthrough in medicine creation, since theoretically pills can be specifically engineered to precisely contain the necessary ingredients with its help.

Another usage is rehearsals before a surgical operation, with which bioprinted organs can help, to make training practical and avoid unnecessary casualties and accidents. Custom prosthetics from biologically compatible materials are simple and affordable solution for the injured people. Finally, yet another way, in which medical 3D-printing can change the future, is spread-out production. Once first warehouses will be outfitted with necessary equipment to produce 3D-printed organs, production will skyrocket. It is possible to remove the deficiencies in organs required for transplant, to allow everyone in need to have access to them, since currently it is hard to find a matching donor and there are large queues for organ transplantation. Reducing waiting time or time lag is a very important aspect, especially for countries with less developed medical infrastructure, where 3D-printing can also be used to print medical tools and equipment [10].

Our findings show how medical 3d printing is seen today and what breakthroughs it might have in the future. During present time 3d-printed anatomical structures could help to accelerate guidance, testing, and education. Scientists say this is all just the backbone of what medical 3d printing can do. Some of them say that we are less than 20 years from making a fully functioning heart. Some of the examples of medical 3D-printing being used today are custom designed perfectly fitting hearing aids and medical tools. 3D-printed

models help doctors get a better sense of what to expect before a surgery and help medical students to practice more and more.

Naturally, medical 3D-printing is an evolving technology, which has not reached its limits. We have provided examples and explanations to show the extreme importance of medical 3D-printing but considering prospects that we covered in this aspect, we have just scraped the bottom. This field of research can lead to significant changes in the world market of medical industry. It is possible that pharmaceutical demand will be partially substituted by the industry of medical 3D printing, as new technologies will provide treatment from many illnesses. In addition, we can now see the goals for Russian industry of 3D bioprinting and how it can change our life in few decades. International cooperation in the field can help individual countries overcome the lack of their technologies or qualified professionals, to make their own breakthroughs. It is important to emphasize the future opportunities that 3D bioprinting can bring to the humanity, because the more attention is attracted to this topic, the bigger will be the potential for it to grow in the future.

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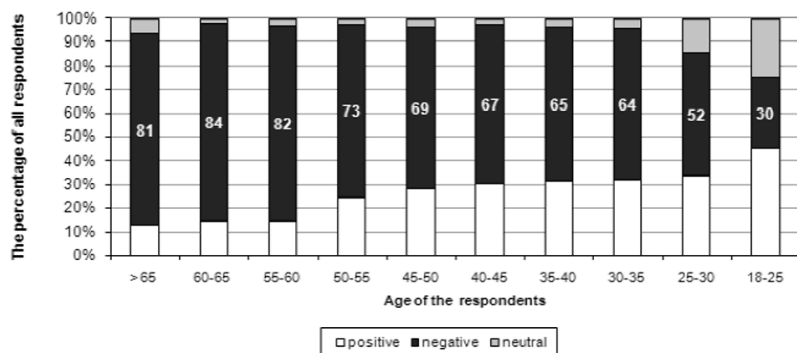
## **Public or private: choosing the optimum ownership structure**

**Abstract.** The paper seeks to explore students' attitude to privatization in Russia and changes in their views throughout the pandemic. A survey was offered to a convenience faculty-based sample of students of economics to establish regularities in their views concerning ownership of enterprises in various sectors. The survey indicates that the perceived importance of the government's role has increased during the pandemic. A description of the existing proportions of the three types of ownership in Russia shows that the students' attitudes are realistic.

**Keywords:** privatization, government, ownership structure, survey, students' view.

### **Introduction**

There is no consensus on the privatization process in Russia either among scientists and publicists, or among the public. Back in 1995 and 2003, two books with almost the same titles were published. In the first one, "Privatizing Russia", M. Boyko, A. Shleifer, and R. Vishny give us a very lovely picture of privatization process [1]. They claim that it is a very important step, necessary for further prosperity and development of the Russian economy. M. Goldman in his book "Privatization of Russia" criticizes the way reforms were conducted and the model chosen in the 1990s for future development [3]. More recent studies reveal huge increases in inequality caused by this reform. F. Novokmet, T. Piketty, L. Yang, and G. Zucman in their article "From Communism to Capitalism: Private versus Public Property and Inequality in China and Russia" show that two thirds of the post-communist growth in Russia were captured by the wealthiest people, while the bottom 50 percent saw a decline in their income [4, 109–113]. People's opinion of the privatization process depends mostly on their age. Podgorny presents the results of his surveys on the attitude to the privatization among different age groups, which clearly show that the older the person, the more likely he disapproves of privatization [5, pp. 21–24].



He concludes his analysis with the proposition that the general attitude to privatization carried out in 1990s may become more favorable only with the change of the generation. For Podgorny, the tendency seemed obvious enough: as time goes by, the population's will to privatize should be growing steadily if no other shocks occur. Today, however, about twenty years later, the situation hardly looks as self-evident as it once did for Mr. Podgorny.

## About the survey

In 2020, in one of our English classes we, students of Moscow State University, had a task to discuss public and private ownership. We were so enthused that conducted a survey among our groupmates. We asked them to point out the optimum types of ownership in different spheres of the Russian economy. The results were so interesting that we decided to apply for participation in the students' conference held in 2021 at the Faculty of Economics of Lomonosov Moscow State University.

Alas! The pandemic ruined our plans since the conference was canceled. In March 2021, when the pandemic was almost over (one year after our first survey), we decided to conduct this survey again to find out what had changed since the advent of coronavirus.

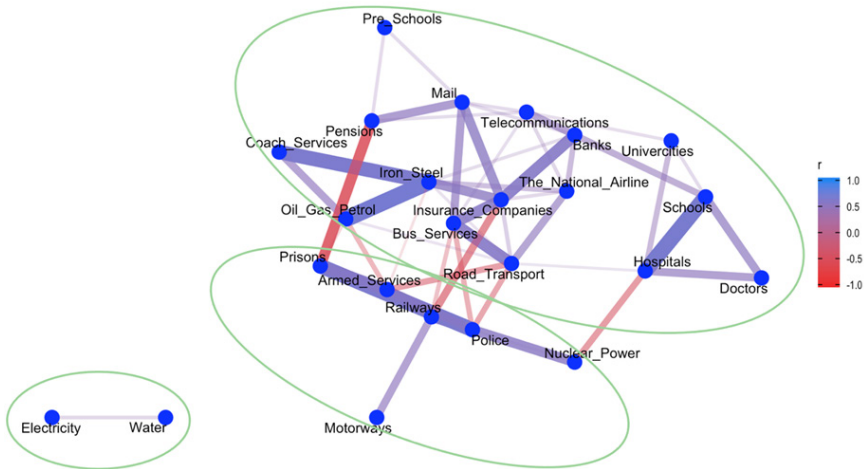
In this way we were suddenly able to conduct an experiment (because no one in the early days of March 2020 knew what would happen later). The survey was rather simple and covered 25 questions. 24 questions asked if the particular sphere of the economy (for example, "Hospitals" or "Armed Forces") should be owned by the government, by private individuals or both types of ownership should exist. The last question did not relate to the topic of this study.

Before we move on to the results, it is important to mention that our survey is based on the opinions of 15 students over a period of 2 years (30 observations). It may thus be biased, and this topic requires further work.

## Correlations and clusterization

For clarity, the results of the survey are presented in several ways. First, built a correlation matrix to get an insight about how the spheres are connected from students' perspective.

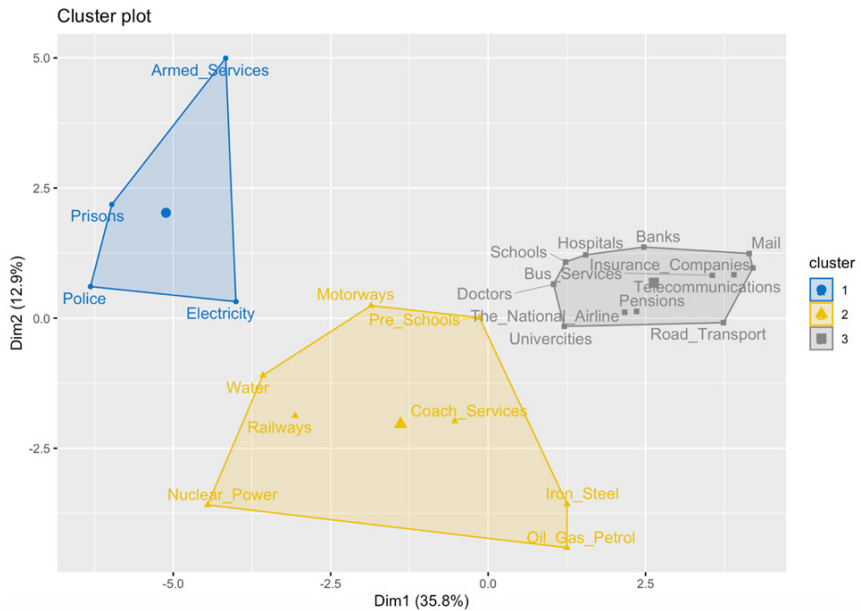
### Correlations between variables



In this graph the blue lines mean positive correlation and the red lines – negative. We can see three groups. The group in the lower left-hand corner includes “Water” and “Electricity”. We call it “municipal services”. It stays aside from the other groups, although there are some internal connections. The second group can be called “enforcement and infrastructure”, which includes “Roads”, “Armed services”, “Police” and “Nuclear power”. The last group has negative correlation with the second. It includes various services that should be owned both by government and by private individuals. For example, we can see “Schools”, “Hospitals” and “Doctors”; “Iron and Steel”, “Oil, Gas and Petrol” and “Coach Services” well correlated with each other.

Then we carried out hierarchical clusterization using principal component analysis (PCA). On the graph below, spheres are presented in the coordinates of principal components (that are based on student's opinions). Dim1 is the first component and Dim2 is the second.





The second component, shown on the vertical axis, is hard to interpret, but the first shows the relation to government from students' perspective. The most state-related spheres are on the left and the least state-related are on the right. Closest spheres to the government are "Police", "Prisons" and "Nuclear Power". Assets that in students' view should be privatized include "Mail", "Insurance Companies" and "Telecommunications".

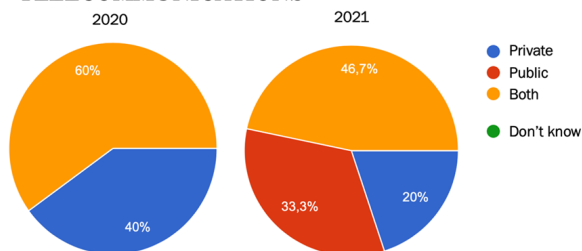
## Results

According to the results of our survey, its participants think that the government should own "Nuclear power", "Prisons", "Electricity", "Water", "Police" and "Armed forces". Nothing changed throughout the pandemic in this respect.

Massive changes, however, can be seen in relation to assets that should be privately owned. After the pandemic, students could not name the spheres that should be indisputably privatized (Before the pandemic, these had been "Mail" and "Telecommunications" most likely to become private).

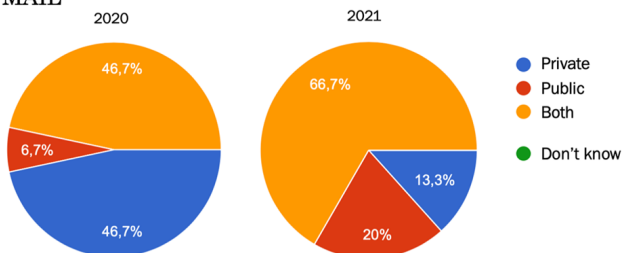
For example, no one before the pandemic wanted TV to be owned only by government. Now the share has reached one third. The share of those who want TV to be privatized shrank from 40% to 20%.

## TELECOMMUNICATIONS



A year ago, those who wanted “Mail” to be privately owned made up almost half of respondents. Now their share decreased by more than three times.

## MAIL

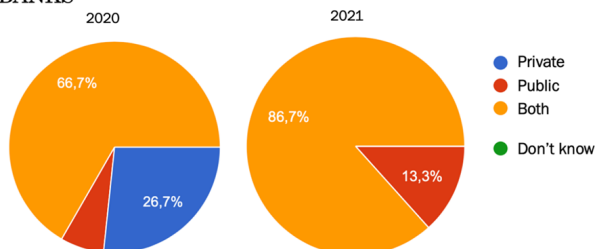


In the students' view, most assets should be owned both by government and by private individuals (Joint ownership: “Road transport”, “Coach services”, “Schools”, “Doctors”, “Insurance companies”, “National airlines”, “Motorways”, “Pre-schools (0–5 years)”, “Universities”, “Pensions”, “Banks”, “Hospitals”).

This group was enlarged by “Mail”, “Bus services”, “Metallurgy”, “Oil, gas and petrol”.

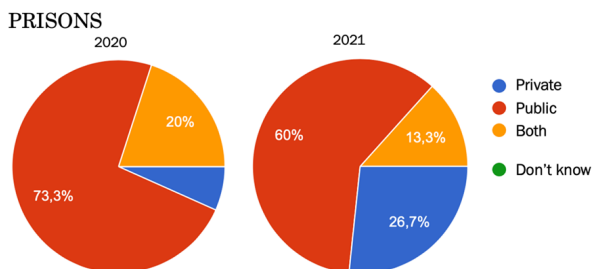
Interesting transformation occurred in relation to “Banks”. After the pandemic, no respondent wants them to be owned only by private individuals. Not a single one!

## BANKS



Our survey includes some arguable points. “Railways” and “Telecommunications” cannot be included in any groups right now.

There is another extremely interesting transformation. “Prisons” make up one of the rare spheres where the desired share of government participation has decreased. It could be caused by activity in politics, or it could only be an ordinary research bias.



## Discussion

Overall, one can see a significant decrease in the will to privatize among students. Covid19 led to the strengthening of the role of the state. Results may reflect the acceptance of the increased government control associated with the pandemic they may be caused by some political events. Anyway, these results are not final, and the issue requires more data and further research.

It is known from the Institutional theory that massive shocks such as wars, natural disasters or macroeconomic crises faced in the young, but already conscious age could cause long-term increase in request for stability. For example, Giuliano and Spilimbergo show that large macroeconomic shocks experienced during the critical years of adulthood shape preferences for redistribution. Individuals who grew up during a recession tend to support more government redistribution and believe that luck is more relevant in determining economic success than other factors including hard work [2, pp. 787–817].

The Survey shows that our students’ attitudes are realistic. Most of the spheres in Russia are owned both by government and by private individuals. At the same time, despite the influence of the pandemic, we can see the will to continue the privatization process.

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## **Going beyond the line: Augmented Reality (AR) as a new way of marketing communication**

**Abstract.** The research examines the peculiarities of deploying the AR-tool in a firm's marketing strategy. The goal of the study is twofold: firstly, to consider the theoretical basis of successful implementation of AR-strategies in marketing/advertising campaigns, and secondly, to analyze the best practices in retail beauty-industry companies. The study applies retrospective, benchmarking and cabinet analysis approaches. The author describes the stages of AR development and identifies some key performance indicators (KPI) of effective use of marketing communication. The findings will contribute to bridging the strategy-execution gap caused by the lack of guidance in using augmented reality as a marketing tool.

**Keywords:** augmented reality (AR), digital marketing, marketing communications, marketing tools.

Online services and tools have already firmly embedded in our lives as they add value to practically all types of businesses. On the one hand, various modern tools and technologies of marketing and e-commerce contribute to providing consumers with fast and smooth customer experience and businesses gain valuable information about them. Such technologies as Artificial Intelligence, Machine Learning, Big Data, etc. help firms collect, store, analyze data and build models of consumer behavior. On the other hand, they are used by businesses, but not customers, so the latter cannot feel the value of the technologies. In that sense, the augmented reality is a special type of technology, which makes it possible to engage people into a digital experience.

In fact, the existing types of advertising, such as ATL (above the line) and BTL (beyond the line), are considered traditional and familiar to any person. The contemporary TTL-approach (through the line), which brings together all the given ways of marketing communication, is considered to be the basis of a successful marketing strategy, but TTL is not often as effective and engaging as the customers would like it to be because its ways of attracting customers' attention are limited and customers are getting used to them more and more.

Some studies examining online shopping have shown that customer satisfaction remains low as well as conversion rate. The point is that it is not an easy

task to ‘visualize’ how products can be used in real life when shopping online. Thus, establishing a fully interactive dialogue with online customers becomes a big challenge for companies [3, p. 884].

After considering all these issues, it becomes obvious that successful marketing campaign must be based on the multichannel approach, and those companies which manage to include such components as *attractiveness, uniqueness, personalization, ability to surprise and repetition of compelling experience* would attract more loyal customers. In this research, to identify how this could be achieved, we will concentrate on the retail and beauty industry cases and online shopping as their service in particular.

To begin with, let us look upon some points of AR-technology theoretical basis. Firstly, AR is a smart technology. It is aimed to enrich ‘online service experiences’. This is achieved due to ‘a more intuitive, context-sensitive interface’ that is equal to the natural way of processing information by customers. “Such an advanced frontline interface can improve service quality” and involve consumers in a more enjoyable online experience. [3, p. 885].

The distinctive media peculiarities of AR consist of three components: firstly, it ‘combines real and virtual’, secondly, it is ‘interactive in real time’, and, thirdly, it is ‘registered in 3-D’. But the most distinguishing feature of AR is the power of creating a mixed reality. The last one means that the environment is natural, but the inner objects are virtual. [8, p. 90].

As far as consumer benefits from using products with AR are concerned, they can be as follows: “(1) functional ... (2) emotional ... and (3) willingness to purchase” [2, p. 3]. The first one is about spending less time, being practical, delivering valuable information, and being interactive. As for the emotional part it implies being trustworthy, having aesthetic quality, “media novelty, immersion, media enjoyment”, and thus making a customer feel satisfied. [2, p. 3]

Notably, ARTillery Intelligence predicts that *number of active AR users all over the world will exceed 1 billion in 2022*. As for *Global AR spending, it is predicted to be as much as \$45.1 billion in 2022*. Besides, AR is no longer considered an emerging technology but a mature one, therefore, these include a vast marketplace for AR applications. Customers’ expectations for AR quality are to increase. Alongside with the rapid development of the technologies and vast penetration of devices that support the given technology, consumer adoption of AR has been increased by global COVID-19 lockdowns. AR is an effective technology for customers and businesses at the same time because it can become an alternative to closed stores, “for customers reluctant to shop in stores, and as an important source of product information for both web and in-store based shoppers” [2, p. 5].

We also need to point out several most important behaviour features of a typical consumer of the near future. These features are crucial in understanding

and predicting the needs of a target audience. A company, which can just anticipate the future trends, will be the leader of a market. Hence, successful market players focus on the customer relationship and make their firm policy client centered. It was mentioned that customer-centricity directly influences the Brand Advocacy Index (BAI)<sup>1</sup> on the online conference “The Future of Retail” by L’Oréal (11.03.2021). And the latter strongly reinforces the brand awareness and customer loyalty, which results in revenue growth as they have direct correlation. Thus, the so-called ‘hyperpersonalisation’ scheme is applied. It implies such behaviour features of a consumer of the near future as following: a client wants to have relationship with a brand; he or she interacts in the digital environment mainly using mobile devices; looking for personalized products and customization options; prefer relevant and entertaining content; expects availability anytime anywhere; gets ‘his’ or ‘her’ product at any time with minimal effort.

At the same time, taking into consideration that online shopping is a service experience, special innovative, distinguishing service strategy is implied to be developed to increase firm value.

Hence, let us examine six “integrated steps in implementing augmented reality into an effective strategy” [2, p. 6]. These steps have been singled out by the authors of the article “Strategies for the Successful Implementation of Augmented Reality” for planning and executing a successful AR strategy:

- (1) determine how AR can help achieve marketing objectives
- (2) choose appropriate products, channels, and target markets for AR
- (3) select among AR application types
- (4) design AR apps
- (5) evaluate alternative AR organization formats
- (6) measure the success of AR programs.

Generally speaking, what a company needs to do is to set a goal of a marketing campaign: taking into account the previous experience a company has to formulate what should be achieved and what should be done. After that multichannel approach is implied to be used. A multichannel approach means creating the rather personalized content delivered through the integrated pool of customized services using all possible types of communication with customers. However, to make the most of the theoretical basis, it is important to study cases of practical application of AR as a way of marketing communication.

In fact, augmented reality as a technology is not a new thing. Its invention dates back to 1968 when Ivan Sutherland developed the first ‘head-mounted

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<sup>1</sup> Due to the BCG “*Fueling growth through word of mouth. Introducing the Brand Advocacy Index*” analysis (2013), brands which have higher levels of advocacy considerably surpass the so-called “heavily criticized companies”.

display system'. A special AR laboratory was soon opened in the University of Connecticut after. In 1990, Tom Caudell, a Boeing researcher, created the term 'augmented reality'. The next two decades showed the world the steady development of the given technology in industrial and non-industrial spheres until the four remarkable events occurred. The first one is about Esquire Magazine's attempt to use AR in print media for the first time in 2009. Four years later, Volkswagen launched the MARTA-app (Mobile Augmented Reality Technical Assistance) mainly to give technicians 'step-by-step repair instructions within the service manual'. Later on, in 2014, Google presented the Google Glass devices — glasses using augmented reality so that customers can get involved in 'immersive experiences' [1]. And last but not least, in 2016, the AR mobile application Pokémon Go was launched and immediately captured attention of millions of users around the world because it was available for everyone who had a smartphone. All these events attracted public attention to the given technology as well as made businesses rethink the opportunities of implementing AR as a business and communication tool.

Speaking about the first cases of using augmented reality as a new way of marketing communication, we will consider the IKEA and L'Oréal practices. They are the world-famous pioneers in this field.

In 2017, IKEA customers got an opportunity to make 'virtual tours' [5]. The company developed a specific mobile application "IKEA Place" to help customers imagine how IKEA furniture products will fit into their personal environments using their smartphones. Let us imagine the following situation. If a customer would like to buy a piece of furniture, for instance, a new sofa, all one needs to do is to download the application and follow several simple steps to find a suitable variant: scan the environment, browse, and select a piece of furniture, move it around and place.

Speaking about benefits a customer receives, they are as follows. Firstly, the application makes it possible to see furniture at the appropriate scale right at a customer's house. Secondly, the opportunity to try the real IKEA furniture products and collect all the information about their characteristics without leaving the house. Thirdly, if a customer does not know yet which type of design s/he is looking for, then a customer can look through the collections and categories of the products compiled specifically to help customers navigate and facilitate the selection process. One no longer needs to measure the proportions of a room or its part to make sure a selected piece of furniture fits in. Moreover, a customer can add pieces of furniture to favourites if necessary, look through 'you may like it' digests and add commentaries and ask questions directly in the mobile application. The application is based on a 3D-rendering technology and was developed with an Apple's ARKit technology [5].



However, IKEA has not stopped at this stage. On the contrary, the company has decided to develop the innovative AR-tool and develop the technology further. They bought Geomagical Labs, a startup developer of augmented reality technologies in 2020. Recently, a new feature has been added to the innovative mobile application: Geomagical technology allows customers to scan a room with a smartphone, remove all the furniture in the photo and add new items [7].

The second case worth mentioning is “Makeup Genius” by L’Oréal. It is a mobile application, which allows users to try any make up they like on their face. The application scans a face, analyses its characteristics, and a user can see several variants of how the company’s products can be used to create different looks in real time.

As for the benefits a customer receives, firstly, a customer can try different products without much effort and easily and immediately change variants without removing cosmetics from the face. Secondly, the application analyses more than 60 skin characteristics. Thirdly, it offers to use the real products already in the right combination, so a customer does not need to think about it. What is more, a client can immediately order the products through the application.

The technology of the application tracks how customers use it and what they buy. By collecting information about people’s preferences, it offers products based on the choices of customers with similar tastes.

“Makeup Genius” is both a brand channel of interaction with L’Oréal customers, and an excellent source of information about people. The application makes it possible to understand the needs of loyal customers and make relevant offers for them. L’Oréal now has more than 20 million customers and provides a personalized experience to them [6]. To strengthen its position, the company bought the Canadian technology startup “Modiface”. “We bought Modiface because we fully believe that such services are the future of the beauty industry,” said Lubomira Roche, the director of Digital Technology at L’Oréal, in an interview to Forbes [4].

The analysis of the two best practices of the retail and beauty industries as well as the consideration of some theoretical points concerning the successful implementation of AR-strategies in marketing/advertising campaigns allow us to detect several key performance indicators (KPI) of effective use of AR as a new way of marketing communication:

1. It should be used to create compelling customer experience.
2. High quality of the technology is crucial for customers loyalty.
3. Customers feel the link with a brand while interacting through the AR-tool.
4. In beauty and retail industries customers can virtually try a product in real environment and get recommendations about it.
5. A relevant and entertaining content is received by customers.

To conclude, the modern world is changing in the blink of an eye and becomes more and more digital. So does marketing. To make the most of marketing campaigns firms need to build strong marketing strategy based on multichannel approach. Augmented reality is a tool with a high potential in this sense as it allows brands and customers interact in a totally new and engaging format. It also helps to enhance customer affinity for online offerings and facilitate online decision making. Currently, it is high time to go beyond the line and use AR as a new way of marketing communication.

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## **Key drivers affecting Chinese yuan exchange rate**

**Abstract.** Since exchange rates are affected by macroeconomic and microeconomic factors, the application of different analytical models and approaches exert a significant influence on the results. This paper discusses the recent studies on the drivers affecting Chinese yuan exchange rate, with the time series data covering the past 30 years. The author examines the political factors and crisis events that drive the exchange rate in the short term. In the long run, China's economic growth, current account surplus and overseas capital inflows may have a greater impact on the Chinese yuan exchange rate.

**Keywords:** exchange rate, drivers, the Balassa-Samuelson effect, oil price volatility, trade war.

## **Introduction**

China is the second-largest economy in the world and a major exporter of manufactured goods. Chinese yuan occupies very small part in currency trade; until 2019, turnover of Chinese yuan ranks 8<sup>th</sup> traded currency, only 4% percent in currency trade, and US dollar, euro account for 88% and 32% separately (the total sum is 200% because each currency trade always involves a currency pair). The macroeconomic environment exhibits complicated and volatile changes, the trade disputes between China and the United States, the stimulus policies of the US to soften the economic impact of the novel coronavirus etc., all of which bring more uncertainties to currency market.

Moreover, China is accelerating the establishment of a “dual circulation” pattern of development where domestic economic cycle plays a leading role, which means inner consumption will be strengthened and less dependent on demand desired from foreign market; therefore, Chinese yuan exchange rate will be less infected. Furthermore, digital yuan pilots are pushed in major cities of China, which is seen as to link domestic and external in the dual circulation economy and will be less dependent on other currencies in international settlement, and will also reduce the risk, negative impact of sanction for us to see how the global reserve currency may change. Therefore, the research on the key drivers affecting Chinese yuan exchange rate is necessary due to the new

changes. It will help us to better understand and predict the economic situation to reduce the risk for business activities.

It is not a very long history for Chinese yuan to go into international market. Since 1979, Bank of China kept two-track exchange rate system, planning system to market regulation, and after 1992, it began to adopt a single but managed floating exchange rate system based on market supply and demand. Until 2005, it formed a managed floating exchange rate regime based on market supply and demand with reference to a basket of currencies. Basing on these stages, many researches had been done to find the contributors that impact Chinese yuan exchange rate. Most of the researchers focused on single or several few indicators, such as the oil price or spillover from oil market, and some are more specific from the demand side and supply side of oil, the US QE policy spillover etc., few studies investigated overall macroeconomic or micro-economic factors that impact Chinese yuan exchange rate.

The US dollar takes a leading position in relevant exchange rate research as it is the main currency and global reserves in the market. Most of the deals are invoiced in the US dollar. Normally speaking, when the US interest rate rises, the US dollar tends to become stronger and commodity prices get weaker. Some investigations also tested the interrelation between oil, gold, stock prices and the US dollar. Increases in real oil price lead to stronger currencies of net oil exporters and weaker currencies of net importers. Others found oil, gold, the US dollar and stock prices have interdependencies; increased use of oil and gold as financial assets exist for speculation or hedging. The USD exchange rate is significantly affected by oil price, gold price and stock market prices; it is also negatively affected by the US CPI [26, pp. 282–289]. For other currencies in Japan, Korea and Hong Kong, the factors affecting exchange rate are totally different. Some currencies are influenced by real oil price while other currencies cannot be influenced by it significantly.

## **Key drivers affecting Chinese yuan exchange rate**

If we just review the studies on Chinese yuan exchange rate, its indicators are also different from the US dollar. Based on the normal currency theories, the real exchange rate for an open economy is governed by the principle of purchasing power parity (PPP). Under a fixed exchange rate, this long-run equilibrium is achieved by convergence of inflation rates between the domestic and reference foreign countries. Other studies are about the money supply and inflation level, these are for long run trend of the exchange rate. There are some interesting investigations made from different dimensions.

The Balassa-Samuelson hypothesis holds that a fast-growing less-developed country in a catch-up industrialization phase often experiences sizable,

long-run real exchange rate appreciation based on the Balassa-Samuelson effect. The research revealed that during 1995–2015, the contribution of the sectoral productivity growth gap to the Chinese yuan real exchange rate appreciation is negative, the Balassa-Samuelson effect (output growth) cannot test the Chinese yuan exchange rate appreciation during this period, but it exists mildly during 2005–2015. The appreciation is driven by high total factor productivity (TFP) growth, namely the real appreciation in the prices of manufacturing and mining sectors [54, pp. 7–14], which deserves further research as the specific sectors that make sense may change now.

If considering the impact of oil price on exchange rate, they use the data from 2013–2019 and found there has been a positive return spillover from Brent to the Chinese currency markets. Positive oil jumps have a negative impact on the Chinese exchange rate volatility, the volatility and jump spillover between oil prices and exchange rates is conditional on the nature of jumps and the oil price series considered. The uncertainty in the oil market has a stronger positive effect on the uncertainty in the bilateral exchange rate market during the long-term oil crisis and the exchange rate formation system reform [91, pp. 1–14].

There are other dimensions of research on the factors of oil price that influence the exchange rates of developed and developing countries. This time it focuses on the oil price shock from different dimensions; from 1996 to 2018, the effects of oil shocks on exchange rates are quite different, the effects of oil supply shock and the oil-specific demand shock on currencies are always negative and asymmetric. Considering the aggregate demand shock, the interrelation between higher quantiles of oil and exchange rate is quite asymmetric. Regarding the oil-specific demand shock, the negative correlation between oil price and exchange rate can be captured at the lower quantiles of oil shock and it turns positive at higher quantiles [52, pp. 1–31]. Investing on the political factors that affect Chinese yuan also has a period since China has been involved in the international market. After the trade war, namely the period after 2018, the research revealed its impact is featured by heavy tariffs on both China and the U.S. and has resulted in depreciations of CNY and the currencies of China's major trade partners, significant intra-regional dependences exist between CNY and other currencies and the trade war has produced diverse effects on the dependence interrelations [68, pp. 1–13].

However, it lacks further analysis about the real situation as in the short terms, Chinese yuan indicates appreciation against the US dollars, and other main currencies show different trends. It is obvious that these studies show the impact in the short term as the political factors make more sense in a special period. There is another research based on the micro level — the heterogeneous agent (psychological factors). Based on the data from 2005 to 2019, it

uses the heterogeneous agents' model to analyze its impact on exchange rate. They found that the heterogeneous agent in foreign exchange market will also impacts the investment behavior towards Chinese yuan, which indirectly influences the exchange rate. The financial crisis and the exchange rate policies of the Chinese yuan will impact their risk attitudes on agents' expectation formation [57, pp. 1–14]. Obviously, it is for a special situation, namely the period of the crisis or another uncertain economic situation.

## Conclusion

The research is done on the basis of the exchange rate theories, the results are examined by different indicators. Normally, appreciation of exchange rate will negatively impact on export, but it also attracts capital inflows, and inflation level will also be higher. From the results of long-term investigations, we can make conclusion that all external and internal factors show important effect on the fluctuation of exchange rate, and the political factors impact in short term. In the long run, China's rapid economic growth, current account surplus and overseas capital inflows may have greater impact on the Chinese yuan exchange rate. And we can also see that due to the different quantitative research methods, some of them have contradictory results, therefore, further investigation should be done to give new predictions in the future. There is no universal set of important contributors or other rules to conclude what factors impact the exchange rate. Varied factors have impact on different currencies during different periods, but the studies provide useful insights for investment, managerial and governmental executive purposes. Perfect economic structure and technological power of one country will play a more significant role in future; only when the substantial factors of the country are built, the economic system will work flexibly to "hedge the risk". And the impact after the application of digital yuan also deserves to be examined in the future.

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## **Digital ecosystems as a driver of SMCs development**

**Abstract.** In digitalization era, with increased competition both on the national and global markets, digital ecosystems become the engine for the development of SMCs. Ecosystems are actively used in the development of mobile apps, sales in marketplaces, and other areas. The paper considers the reasons for the appearance and characteristic features of digital ecosystems, examines their role in the development of a modern company and provides the examples of their efficient application in modern economic activity.

**Keywords:** digitalization, digital ecosystem, industrial revolution, small and medium enterprises.

There is a qualitative change in the economy in times of the third industrial revolution, and the development of microelectronics and the Internet. Under the influence of various technologies of data digitization, integration of digital technologies in various spheres of society, the entire economy becomes digital [5, pp. 9–11].

The emergence of digital economy has had an impact on various spheres of society. Digital technologies are widespread everywhere: in educational institutions, hospitals, factories, etc. They are used to create additional and virtual reality, in machine learning, in robotics, in the field of artificial intelligence, healthcare, and in others [1, pp. 43–47]. For example, in educational system, digital technologies are increasingly being used to provide a distant form of education that in times of pandemic is of great importance. An example of digitalization in medicine is the development of equipment for remote monitoring of health as well as the application of electronic maps. In agriculture digitalization is associated with cultivation and harvesting of crops, the creation of the so-called ‘smart greenhouses’ and ‘smart farms’.

Drawing on these examples, we can distinguish the following tasks of digitalization:

- (1) integration of data and information systems;
- (2) storage and analysis of heterogeneous information, which is automated;
- (3) application of predictive management practices.

Concerning the influence of digitalization on small and medium-sized enterprises we can distinguish the following impact:



1. Acceleration of business processes with minimized human participation. For example, at present, entrepreneurs bear fewer costs for promoting their own products on international markets. Specialists can do this via viral marketing since now. This, in turn, increases not only the company's profit, but also makes the goods received more accessible.
2. Strengthening of the role of robotics. The widespread application of robots in production allows companies to produce their products in a shorter period.
3. The development of the "Internet of things" (IoT). This allows to establish the interaction of devices with the outside world using communication technologies and connection standards. An example is the creation of a "smart home" system.

As it was mentioned before, digitalization has changed the life of society and one of these 'innovations' that at the same time acts as a competitive advantage of a modern innovative enterprise is a digital ecosystem [2, pp. 35–37]. First, let us consider the origin of this term. The concept of 'ecosystem', taken from the natural sciences implies a biological system formed via interaction between living creatures and natural environment they live in. In an economic context this concept implies a certain environment where various enterprises and services interact with each other. Considering the concept of 'digital ecosystem', it is important to mention that it is a set of digital services of the company united by a technological platform.

A digital ecosystem is an adaptive, open system with the properties of self-organization, scalability, and sustainability inspired by natural ecosystems.

The main factors that influenced the appearance and development of digital ecosystems are:

- (1) high competition in the market;
- (2) changing the nature of competition;
- (3) development of the Internet;
- (4) big data development.

Based on these factors, it can be understood that business has moved to a new level becoming e-commerce. But it is important to note that digital ecosystem allows not only to increase the competitiveness of an enterprise, but also to increase the capitalization of the company and the customer loyalty, to reduce the costs of attracting customers. It follows that digital ecosystem helps to accelerate the innovative development of the company, allows increasing profits and reducing restrictions on marketing activities [3, pp. 12–13].

At present, the number of digital ecosystems is growing rapidly. Digital ecosystems were created by American companies (Amazon, Google), Russian companies (Sberbank), Chinese companies (Alibaba Group) and others. It becomes clear that the creation and development of a digital ecosystem requires

not only a large number of financial injections, but also competent planning of the company's development strategy since the creation of a digital ecosystem is an element of innovative development of companies.

It is important to note that first of all companies take care of the key business areas that bring the greatest profit. Even though the company generally adheres to the main type of activity while investing in a large number of different areas strives to maximize profits. But in the first place companies should focus on the type of activity that brings the greatest profit. It has a significant impact not only on further innovative development, but also on the development of an organization in general.

Any platform has certain core products that are based directly on it. Through directly producing these products the company will be able to ensure stable development and growth of financial indicators [4, pp. 19–26]. When the product starts to bring the company stable revenue it can enter related industries.

The most important recommendation for any company is to follow the takeover tactics of other startups in certain industries of interest. The advantage of this tactic has been proven many times in business practices. The acquisition of other services or startups allows the company to take its place in a new market. But it is also important to note that the company should acquire other companies if there are available funds.

In another case, the company must make significant investments in the development of digital ecosystem, hiring highly qualified personnel, etc.

After the digital ecosystem of a company starts to develop rapidly, the company needs to take care of its sustainable development.

Depending on whether the company has idle funds and development strategy, the following paths can be chosen:

1. Switch to new markets, create a platform on them and create services around it.
2. Monitor the market, find new growth incentives, and absorb promising companies that will already have established business processes and already have their own audience.
3. Combine the previous two approaches. For example, platform can be created in a new market and then increase its value absorbing companies in related markets.

Companies often face this stage with a certain choice related to investing finance in a particular area. The company should not disperse in several directions as this can threaten a sharp drop in profits due to the bankruptcy of the acquired companies.

Digitalization of business is an extremely complex issue. Small often and medium-sized businesses do not often have enough funds to digitalize their own business, but digitalization is also reflected in the activities of small

companies that can sell their goods and services over the Internet, develop personal websites, and promote their products around the world [3, pp. 23–25].

Due to digitalization the previously existing framework, the barriers between the consumer and the seller are erased. Business becomes international, transnational.

Following the experience of large companies and corporations mentioned earlier, small and medium-sized enterprises will be able to enter the international market in the long term, in order to find new markets and acquire loyalty around the world, which in times of increasing competition on the domestic market is becoming of primary importance.

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## **The possible applications of blockchain technology in finance and insurance**

**Abstract.** The aim of this report is to present the ways of applying blockchain technology in FinTech and insurance. The author analyzes the blockchain technology itself and the prospects of technology implementation in financial sector and insurance products and services to improve data protection. The research has been conducted with application of theoretical approach and empirical study of evidence from companies that have already commenced to use blockchain technology.

**Keywords:** blockchain technology, finance, insurance

### **Introduction**

Blockchain is a relatively new technology, and much attention is paid at present in various fields (besides the most popular one with cryptocurrencies): people attempt to apply blockchain for storing and processing data and identity, in marketing and computer games and other processes and spheres. Possible applications of this technology in finance and insurance are presented in this article.

### **Essential information on technology**

To make clear what blockchain technology is and how it functions, a list of specific concepts (which are presented in *italic*) was worked out during the research.

An *asset* is something of value: for example, money, property, securities, information. Assets can exist in the real world, such as an apartment or a car, or they can be completely digital. When people transfer assets to each other, it is called a *transaction*. And the main aspect is *transaction accounting* that is the process of recording all transfers of an asset or rights to it from one person to another. There are some unavoidable risks if transaction records are kept only in one place. Blockchain technology mitigates such risks because it offers a *distributed ledger*-based accounting system.

In the blockchain, the owner register is not stored on the server of one organization. Its copies are simultaneously updated on many independent computers connected via the Internet. The concept of *consensus* is necessary for information to be complete and correct.

If some network participants turn off their computers and some of the transactions are not reflected or their records turn out to be incorrect, this will not affect the operation of the network. The consensus procedure will restore the correct information. Records about transactions are comprised in one *block*, where the information about several transactions is stored, including data about the participants and transaction values are reflected. Blocks, at the same time, are united into a single *chain*, inseparable due to the consecutive links of all blocks. Blocks cannot be changed or deleted; only new ones can be added to the chain by *miners*.

Miners perform several functions in the blockchain:

- (1) store copies of the blockchain and protect information from loss or forgery;
- (2) confirm transactions;
- (3) verify transactions that have been registered by other miners.

Their motivation is receiving a *reward*. As a rule, commissions from all participants in transactions are recorded in a block, as well as from the network itself. But who of the many miners will win the right to add a block and receive a reward for it? Most blockchain networks generate special *tasks*.

The likelihood of success for the miner, which means he is the one who will solve the mathematical problem first, attach the block and receive a reward for this. This fact most often depends on the power of his equipment. The more productive his computers are, the more chances he will make money. To receive transfers, miners use anonymous digital *wallet*, which is a special identifier. E-wallet data and blockchain transactions are protected by *encryption*.

In blockchain networks the buyer and the seller of an asset confirm the transaction using cryptographic keys, that is special unique digital codes. It is almost impossible to guess the sequence of characters of the digital code of cryptographic keys. This makes blockchain technology one of the best for financial transactions [7].

## Currently existing areas of blockchain application

*Identity management* services allow users to transfer personal data to the blockchain, thereby creating a digital identity [9].

The process of *international transfers*, which usually takes a lot of time, money and parties involved, thanks to the blockchain, will significantly reduce

transaction time and costs, and remove the need for a complex information structure.

*Copyright infringement* is considered to be one of the biggest problems in creative fields such as art, music, film, and literature. The blockchain application allows authors to assert and protect copyright and intellectual property rights.

*Smart contracts* exist in the form of an algorithm that allows you to conclude self-executing contracts on the blockchain. This type of contract is ideal for the use in commercial transactions, since they guarantee the transfer of funds or some other action as soon as all parties have fulfilled all the obligations specified in the contract. Smart contracts do not require intermediaries and are executed automatically, which makes them an especially convenient tool for startups.

The *Internet of Things* is a class of devices that can exchange any kind of data with each other, thereby creating a network of interactions. The use of blockchain can guarantee the safety and integrity of data on the *Internet of Things*, as well as provide a reliable security system. The use of the blockchain may allow states to use a completely transparent *electronic voting* system, with the possibility of verification by the voter.

Startups implying *anonymous messaging* like Obsidian, use blockchain technology to securely exchange information in chats, instant messengers, and social media [11]. Unlike WhatsApp and iMessage, Obsidian uses blockchain to secure user's metadata such as email, phone numbers, or any other identifier. There are several startups developing a project to launch a decentralized peer-to-peer network operating without a main server, which will provide *protection against DDoS attacks* [9].

## **The possible applications of the blockchain technology in finance and insurance**

### *Financial sector*

Banks, due to the specifics of their activity, must constantly check and reconcile data. These processes are now rather slow and ineffective. It is also necessary to point out that modern banking system is not perfect. Customers pay high commissions to banks and do not understand exactly where their money goes. Banks must maintain a large staff and use the SWIFT interbank transfer system, which is not always reliable.

The use of blockchain allows to exclude intermediaries while performing banking operations and also allows to automate many processes. The efficiency of the banking system is, as well, increased by reducing costs [6, p. 33].

The main possible areas of application of blockchain in the banking sector are:

1. Carrying out fast and cheap transfers, necessary for international payments and other transfers. While in banks such transactions and related operations require a long period of time and are of increased costs, which consequently leads to large volumes of money spent at a global perspective, in cryptocurrency systems, on the contrary, such operations take a short period of time shrinking to just a few minutes and result in lower expenses [3, p. 231].
2. Another potential area is the possibility to automate many processes, which will also lead to rapid transaction conducting and decrease costs in the long run. What is more, the technology would make the process of document circulation control easier due to its transparency. In addition to this, the blockchain technology implies invariability of initial versions of data, so it means that the human factor during document circulation and other processes is excluded [1, p. 148].
3. Ensuring the immutability of transactions, which means the impossibility of making changes retroactively and forging reporting. The banking system is not transparent. The blockchain technology, on the contrary, as has already been mentioned, will lead to a simplification of transaction control so that the trust level of the transaction participants results in a significant increase [10].

However, the blockchain technology may not become a universal solution for all the problems of banks and the banking system, since its technical characteristics do not contribute to its ability of data processing in extremely large amounts. Furthermore, the application of blockchain does not correlate with banks vision as it is not compatible with their standards and policies. Finally, the blockchain technology requires a huge amount of storage capacity [5, p. 71].

The process of the blockchain technology implementation into the banking system is also an antinomy because the general and basic idea of this technology is in decentralization, the essence of the banking system is, on the contrary, in complete centralization and total control. Besides, millions of jobs could be at risk.

Blockchain has been considered a technology that is supposed to become one of the main factors of the potential upcoming technological leap. During the whole humanity history only those technologies led to substantial positive changes, which were able to present and introduce the simplest solution to some issue or problem. It is essential to point that the disadvantages and weaknesses of blockchain are possible to be neutralized or minimized, especially in case of technology joint application. The only hitch is that it is necessary some time to pass so that people realize blockchain to be the best solution for the presented problems.

## *Insurance*

From the insurer's point of view, blockchain can provide a secure way to track transactions and store information, integrate partner ecosystems into your business and develop completely new products for the client [4, p. 106]. There are several areas, in which the use of blockchain can give a new impetus to the insurance business.

**Financial security.** An independent database may help to eliminate health insurance fraud (as well as in some other insurance services). Furthermore, the blockchain will be able to reduce the number of errors in processing large amounts of data, which is significant for the reinsurance market.

**Dealing with claims for reimbursement.** Blockchain and digital technologies, in general, simplify and accelerate the dialogue with the client in the case of an insured event. The easiest way is to remotely assess the damage by a specialist through a mobile phone camera. The data arrives at the insurance company much faster, which saves the time of the client and the insurer and, surely, money [8]. For example, farmers who have lost their crops due to bad weather receive reimbursements, the volumes and amounts of which are directly related to and impacted by the results and conclusions of analysis of weather information. Receiving data from meteorological stations by the insurer using the blockchain will make it possible to calculate compensation more fairly.

**New methods of distribution.** As for car insurance, it is important to analyze the information quickly and accurately, and the blockchain will help. The processing of large amounts of data will help to offer clients personalized policies for a set of services [2, p. 63].

What is more, the use of blockchain will stimulate growth in the market for microinsurance and microfinance companies because microtransactions is one of the proper spheres of blockchain application. Using blockchain, insurers are developing the concept of mobile wallets. Their content will be limited in terms of the number of tools, but the client will be able to use them anytime and anywhere. Big data analysis and the use of blockchain will allow insurers to determine consumer behavior and look for interesting new market niches for development more deeply and more accurately.

## **Conclusion**

This research provides the following conclusions:

The blockchain technology will improve data protection in financial and insurance industries. However, it is necessary to point out that this technology has several technical disadvantages that may limit its application in these



spheres. For instance, if there is a large number of transactions, it takes a long period of time to process them. In addition to the applications mentioned in the article, the blockchain can also be used in health care, logistics, public administration, production, retail etc. It is surely possible to state that the blockchain is the technology of future.

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## **Challenges to flexible development methodology implementation**

**Abstract.** Many software development teams in various companies face the challenges of mismanagement and poor work optimization. One of the key reasons for this problem is a complicated and hierarchical management approach. In this context a new problem arises — managers often lack knowledge on flexible development methodologies and ways to implement them. As an alternative, various authors and business experts offer more flexible methodologies. In this paper we observe various flexible development methodologies and provide solutions, which might help make a proper choice of a specific one and to avoid common mistakes while implementing it.

**Keywords:** flexible development methodologies, IT project management, Scrum agile method

The purpose of this article is to provide an overview of the difficulties and obstacles, as well as the advantages of implementing agile methods in a traditional development environment.

The theoretical part of the study presents the traditional methods briefly represented by the classical model and the model of iterative and incremental development — the Rational Unified Process (RUP), as well as the advantages and disadvantages of using traditional methods, and a brief introduction to agile methods with emphasis on the Scrum agile method. Finally, the study presents a comparative analysis of traditional and agile development methods.

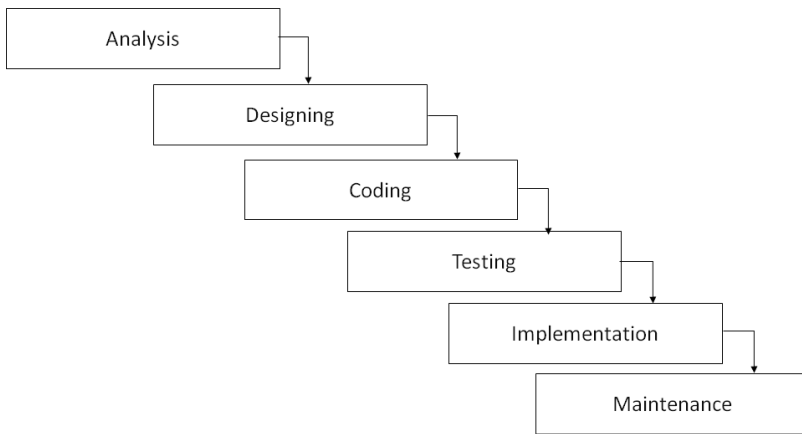
Traditional methodologies known as heavy or oriented planning are known for predetermination of all software requirements and features before developing it with no space for change. This is represented as rigorous planning documents that will guide the entire development process [5, p. 112].

However, this methodology has emerged in an era when software development was based on mainframes and “dumb terminals” [5, p. 16]. There were no tools to support development as code analyzers and debuggers. The documentation had to be comprehensive and consistent because it costs to make a change was very high.

## Classic Model

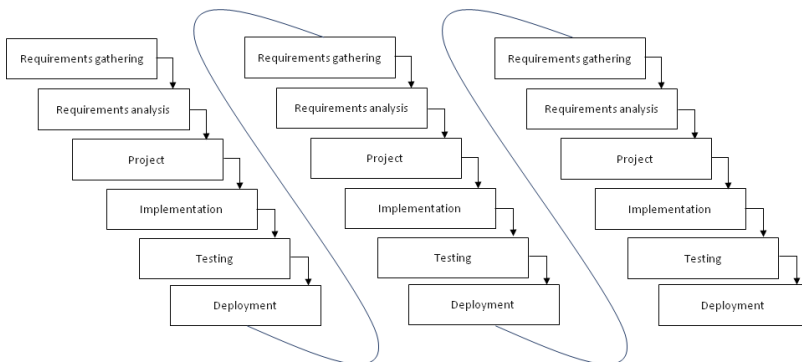
According to Roger Pressman, the classic model was the first methodology published and is still widely used today [7, p. 56].

The Classic model or “Linear Sequential model” establishes a sequence of steps. Each stage has a beginning and an end with a strict documentation set to be followed between one step and another, as the process does not continue without it. The classic example of this model is called “Waterfall” (see figure 1).



**Figure 1.** Waterfall Development Model

The spiral model is also a classical model, but unlike the waterfall model, allows return to earlier stages.



**Figure 2.** Iterative and Incremental Model

## **Iterative and Incremental Model**

The iterative and incremental model (see fig. 2), replaces the classical waterfall development, making it a bit more dynamic because it is divided into a series of time-boxed iterations. Each iteration results in an increment, which implements each of its disciplines.

## **RUP**

Created by Rational Software Corporation, the Rational Unified Process (RUP), originally developed by Rational Software and acquired by IBM in February 2003, is a well-defined and structured software engineering process, which clearly specifies who is responsible for each task, how and when they should be performed.

The RUP is based on three basic elements: use cases that guide the whole process of development, architecture-centric and iteration, incorporating the best practices of software development through guidelines and skeletons that help programmers to focus on the project.

According to Per Kroll, RUP organizes the software development into four steps [6, p. 74].

- (1) home (inception)
- (2) development (elaboration)
- (3) construction (construction)
- (4) transition (transition)

They deal with issues about planning, requirements gathering, analysis, implementation, testing and deployment of software. Each phase has a crucial role to achieve the objective, distributed among various professionals such as System Analyst, Designer, Test Designer, among others.

## **Advantages**

The traditional management methodology is still most widely used. But this situation is changing with the introduction of agile methodology that is gaining a huge number of followers and supporters all over the world.

One of the major advantages of the traditional method is to obtain data on historical facts and repetition, improving the ability of the process through standardization, measurement, and control of the project.

## **Disadvantages**

The Classic model was the only model until the mid-1990s. Since then, several studies questioning the effectiveness of the model began to emerge.

It was noticed that the traditional models hid a number of serious problems, such as:

1. There is a problem for delivery within the scope of considering all the features requested (Standish Group, 1995). Based on 8330 projects, only 16.2% of these projects were delivered on time and cost stated initially. About 31% were canceled, and 52.7% were delivered with only 61% of the functionality provided without respecting deadlines and cost an average of 159% higher than forecast.
2. They should be applied only in situations, when the system requirements are stable and foreseeable future requirements.
3. The traditional method of development (CSS) does not allow any changes.
4. The RUP is characterized by the large number of documents generated that sometimes slows down the development of the project.

## **Agile development methodologies history**

Agile Methods originate in iterative and incremental design and development, the methodology adopted by engineers over 75 years ago and applied in software development in mid-1950s. It preached the advantages of avoiding the discouragement of management and increasing customer satisfaction.

In the 1990s, the modern Agile began to take shape when in 2001, Kent Beck and 16 other noted software developers, writers and consultants met to discuss the best ways in the process of software development, creating thereafter the Agile Alliance and the establishment of Agile Manifesto. Through this work, it stated that:

- (1) individuals and interactions over processes and tools
- (2) working software over comprehensive documentation
- (3) customer collaboration over contract negotiation
- (4) responding to change is more important than following the initial plan.

Agile methodologies bring concepts that are not applied in the traditional methodology as higher customer participation in the process, extremely short iterations, and the emphasis on automated testing. Agile development provides important benefits, but it should be noted that it is not applicable to all kinds of projects, products, people and situations, nor is contrary to traditional practices of software development.

## **Agile processes**

One of the best known methods in this category is XP (Extreme Programming) or XPM (Extreme Project Management) and SCRUM, which are focused in this study. We can also quote many others such as: DSDM (Dynamic System Development Method), Crystal, Feature Driven Development (FDD), Lean, Test-driven development (TDD), etc.

### **Scrum**

Scrum is an agile software development method that was conceived by Jeff Sutherland in the early 1990s and featured collaborations of Ken Schwaber and Mike Beedle, aligned with the Agile Manifesto in recent years. It follows an iterative and incremental philosophy to optimize predictability and risk control. Its principles guide the development activities within a process that incorporates the framework of activities: requirements, analysis, design, development and delivery, worth remembering that Scrum is not synonymous with agile management, but one of many management frameworks mentioned above.

### **Major roles of scrum**

- (1) product owner - the one who represents the stakeholders
- (2) Scrum master - a facilitative team leader who ensures team's adherence to the chosen process and removes blocking issues
- (3) Scrum team — the project team designed for analysis, implementation, and testing.

### **Scrum process cycle**

Each activity takes place within the framework of a standard process and time called Sprint. The number of Sprints needed to complete each activity varies with the size and design complexity.

A Scrum project can be started even if you have only a superficial view on the software requirements and the features the future users need, which will be clarified as the project evolves.

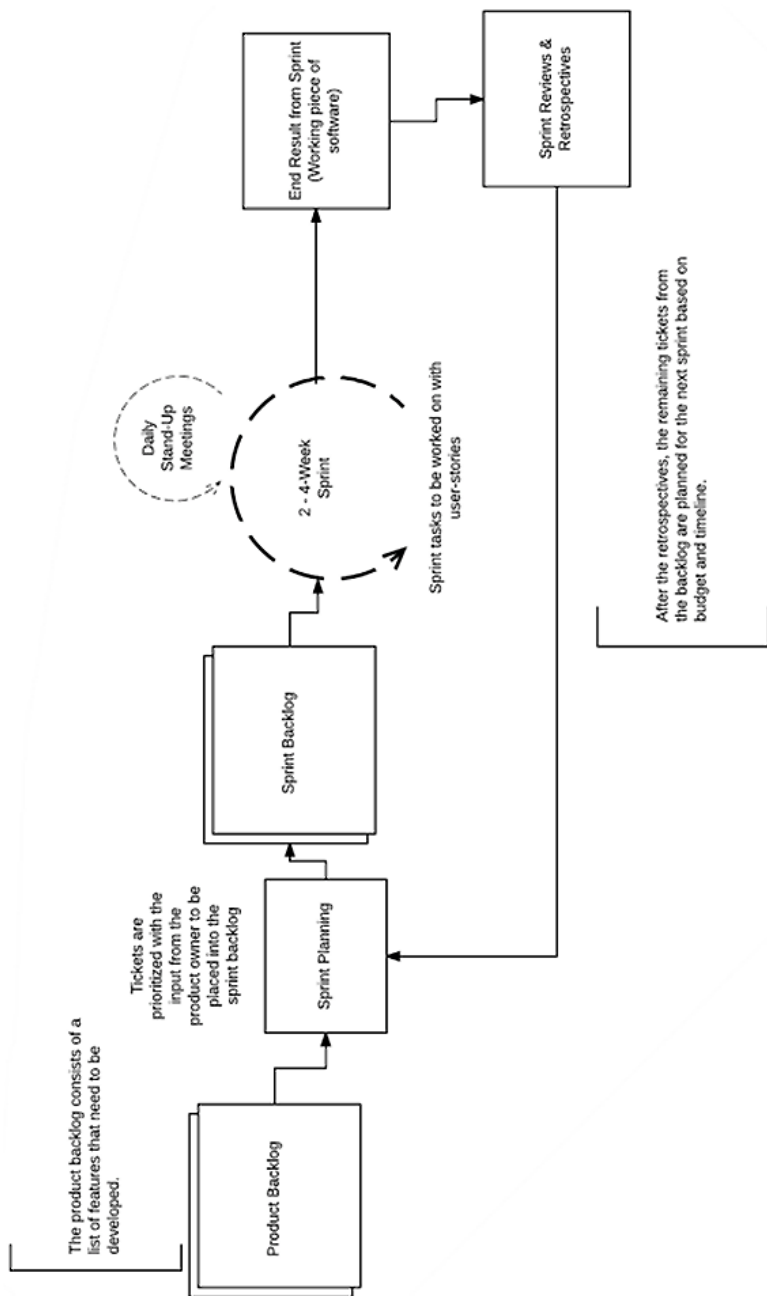


Figure 3. Scrum Cycle

## **Agile vs. traditional**

One of the most frequent questions is: which is better — traditional or agile methodology? It is not easy to answer this question because it depends on many factors such as company culture, size of project life cycle, etc.

Traditional methodologies should be applied only in situations when the software requirements are stable and future requirements are predictable. These conditions are difficult to achieve since the requirements for development of software are changeable. The factors responsible for changes in requirements and difficulties in defining the project scope are organization changes, changes in laws and changes requested by stakeholders.

That's where the advantage of using Agile Methods comes from. The option of using agile methodologies provides means to evaluate and respond to frequent changing of requirements or external factors experienced during the development of software, making it more flexible.

## **Deployment**

The three main critical success factors for an agile project are: culture, people, and communication.

The process of cultural change is the main obstacle in the adoption of Scrum within organizations. In face of this situation researchers recommend gradual transition from classical processes to agile development, making the shift smoother [3, p. 132], [7, p. 171].

The senior management must be aware of the principle that implementation of agile methods in the company, may impact many departments and teams inside the company apart from the development team - customers, managers and even other departments and areas with no apparent link with the project. They should achieve a general consensus on a new form of work thus avoiding future problems [7, p. 156].

## **Conclusion**

The Agile Scrum methodology seems to be a refinement of iterative methodologies with emphasis on the interaction between project members and stakeholders [7, p. 173].

Even the PMI (Project Management Institute) recognized the need to provide alternatives to suit the present scenario, more dynamic, where changes are more frequent, with the Rolling Wave Planning, or “planning in waves,” which is based on progressive planning project, where the work to be done in the



short term is more detailed, and progresses to next step, or wave, as the project proceeds and later details become clearer.

Thus, it was noticed that Scrum can be used in addition to traditional methods. It has the distinction of being a good communication tool, which provides a management framework that is much more collaborative and pleasant to work with in comparison to traditional methodologies.

The implementation of Scrum can bring great benefits but its success will depend on the conduction of cultural change strategy within the organization and the commitment of the entire team.

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## **Behind beauty: understanding beauty marketing of tomorrow**

**Abstract.** The beauty industry remains one of the most promising areas for entrepreneurs, regardless of the time and economic conditions. The article addresses the changes in the beauty reality as an opportunity to analyze the marketing trends of 2021. The article also discusses the need to explore the trends of the digital space. Much attention is given to the features of the beauty industry and the impact of COVID-19 on this industry in the long-term.

**Keywords:** digitalization, beauty marketing, social media, marketing strategy.

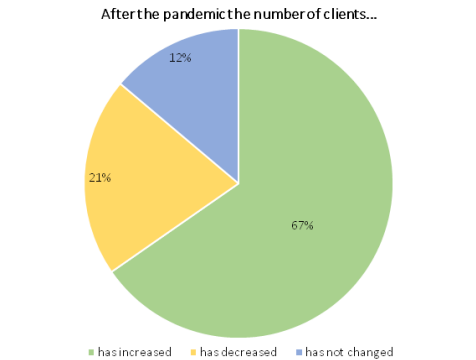
The raging pandemic has affected all walks of life and the beauty industry is not an exception. The beauty salon workers had to suspend working during the isolation period. Moreover, approximately every tenth beauty salon did not pass through the pandemic [5]. No one could have known what the consumer behavior in the new conditions will be like. For example, how much the demand for online sales will increase and how the quarantine will affect social networks.

The key issues of the article are how the beauty industry representatives have managed to reshape their activities during the pandemic, which aspects are particularly important in this industry and which trends can be observed.

The full-cycle chain salons, where visitors are offered a range of services, were the most stable. The least protected were small mono studios with a niche specialism. So the majority of them went bankrupt [6]. This is not surprising: every month compliance with the recommendations of Rospotrebnadzor costs beauty salons more than 300,000 rubles [4]. This amount is unaffordable for the mono salons that have been without profit for several months. Therefore, according to the vice-president of the Russian Association of Beauty Industry Entrepreneurs Nina Litvinova, 15% of specialists went underground during the pandemic — that is, they started to provide services at home and became self-employed.

On the surface, in the context of the pandemic, the crisis seems to have led to changes in the beauty industry for the worse. But that is not entirely true.

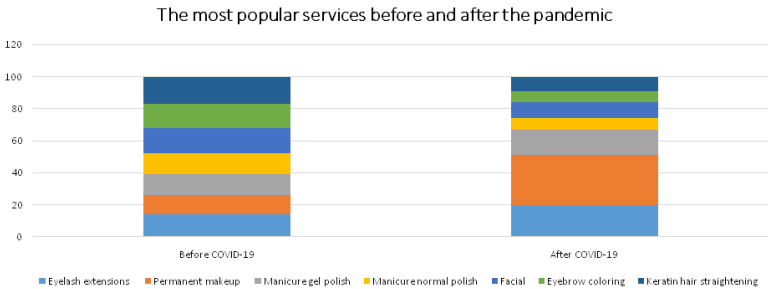
After a long lockdown, many clients have revised their views on beauty for fear of new wave of COVID-19. They began to give preference to procedures, the result of which is preserved for several weeks: for instance, the interest in permanent makeup has increased dramatically (see fig.1). However, the growth in the number of beauty clients is also observed with other types of services: manicure, eyelash extension, etc. To make sure that the interest in salon services has really grown, a preliminary study was conducted. The study involved 100 employees of the beauty industry, aged 18–40 from different cities of the Russian Federation with a population of over 500,000 people.



Compiled by the author on the evidence-based study.

**Figure 1.** Change in the number of clients after the pandemic in the beauty industry

It is also worth mentioning that the beauty workers signed up not only their loyal customers, but also those who decided on the procedure for the first time to feel more confident in the case of repeated quarantine (see fig.2).



Compiled by the author on the evidence-based study.

**Figure 2.** The most popular services before and after the pandemic

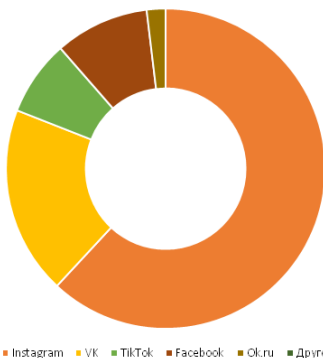
The pie chart shows that the clients really began to go not only for the beauty treatments that they had previously attended, but also to new ones.

It is a known fact that naturalness is a rising trend worldwide. Over the past year, this trend has also been associated with the fact that the average unemployment rate is growing worldwide. More and more people do not have enough disposable income to pay for their desires, such as going to a beauty salon [2]

It is important to note that marketing in the beauty industry has 2 objectives: to attract and to retain. All areas of the beauty industry have realized the importance of using various elements of digitalization — CRM systems with online recording functions, reminders, loyalty systems, and so on. Social media is the most powerful tool of the Internet marketing, which is the most important source of customers for the beauty industry. People spend two hours a day on average sharing likes and reposts. Every second, there are half a million posts on Instagram. Social media takes up most of people's time throughout the day. The beauty industry cannot take the advantage of the opportunity of this tool. Moreover, the study has shown that the beauty industry is very active in social networks and promotes itself only online.

Most people polled, chose traditionally successful networks for beauty workers (see pic.3), specifically Instagram, VK and Facebook. Moreover, TikTok caught the eye of the beauty experts. It has been established that the user accounts are an important part of the brand image. And the more the page meets the audience's expectations, the more potential subscribers will be interested in it.

What social networks do you use to run and promote your business?



Compiled by the author on the evidence-based study.

**Figure 3.** Social networks used by the beauty industry for promotion

Why is the company's online presence important for consumers of beauty salon services? The study by the communication agency "Migel Agency" has shown that 69% of people polled want to be aware of discounts from the company itself. 53% of respondents want to get information about services from the beauty industry workers. 58% rated the opportunity to analyze real, "live" responses [6].

Also noteworthy is the fact that reviews are one of the main confidence-building tools. Human behavior is strongly influenced by the behavior of others. Buying is not an exception. When making a choice in favor of a product, the customer wants to know the opinion of other customers about it. According to sociological and marketing research published by Vendasta, 92% of buyers read online reviews [1], that is why such a simple and powerful social proof as reviews should not be ignored by the beauty industry.

The new reality has set many other trends, and some changes resulting from the COVID-19 crisis are likely to be permanent. To understand the changes in the beauty industry, let us have a look at each of the trends in detail.

The industry will continue to evolve in the direction of digital context [7]. Therefore, more and more attention in the field of beauty will be paid to e-commerce. Digital channels will become a priority, and the involvement of artificial intelligence in the sales process will be accelerated. AR content and AR masks in particular (special filters that add visual and audio effects to the image using additional reality technologies) in social networks allow brands to reach a wide audience of respective customers. This is a great chance for the beauty industry to use the "try before you buy" business pattern in the context of the global trend of O2O communication (online-to-offline) and digital technologies. The clients can go to the profile and open the camera to try on or test a product or service. These two actions that allow to reduce the process of try-on in a real store or salon, and, consequently, the time to make a purchase decision. For instance, a consumer can "try on" a hair color directly on Instagram before changing his\her hairstyle. Another example is the new Virtual Nail Salon app launched by L'Oréal. The app allows to actually top up fingernails with shades and textures.

Another notable trend is the rise of do-it-yourself (DIY) beauty care. Many beauty salons have closed, and even in places where they have not, consumers are forgoing services because of concerns about close physical contact [3]. Many clients now prefer to dye their hair and manicure on their own. A McKinsey Global Consumer Sentiment Survey reported rises in the sales of hair dye and hair clippers by 23 and 166 percent respectively (see fig. 4). What should professionals do in this case? They can hand out advice. The beauty worker will be a trustworthy expert in the minds of consumers as a result.

## Do-it-yourself and self-care beauty products are growing quickly in the United States.

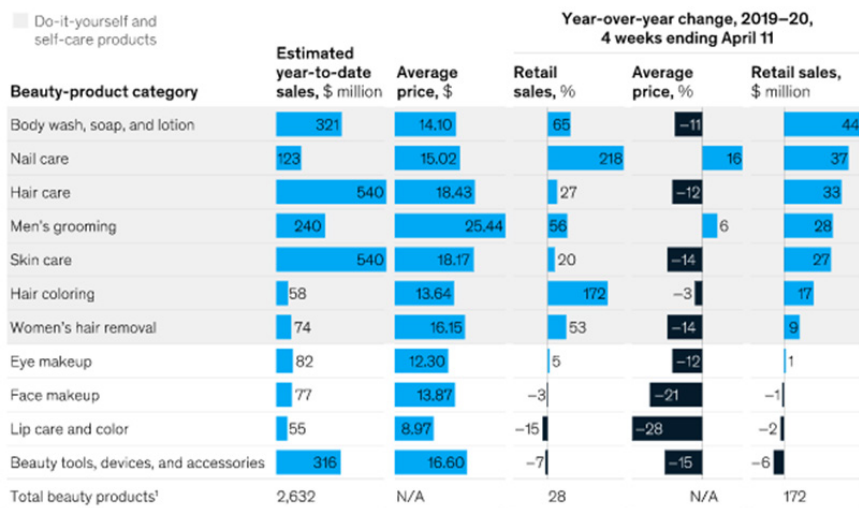


Figure 4. Do-it-yourself and self-care products are growing quickly [3]

The next trend is an online appointment. It follows on from the previous trend. Undoubtedly not all issues can be solved online, but the beauty experts can offer consultations on individual issues. The best proof of this fact is tele-medicine. Besides, many people have got accustomed to zoom conferences during the isolation, so they will easily agree to a video call session, during which the cosmeticians can easily assess the skin health and so on. For most beauty experts this trend is a great opportunity to pick up a flat.

To conclude, I would like to emphasize the importance of the digital space for the beauty industry. The e-commerce will shortly move to a conceptually new level. In addition to launching online platforms, the beauty salons are beginning to capture new opportunities of rich content (professional graphics, sound, animation, videos and AR), use CRM systems, etc. To make the most of the beauty industry experts should consider the following:

Firstly, one should create high-quality content in social networks adapted to the country and the audience, the native content should meet customer expectations. The main value now is health. That is why the beauty experts should focus on hygiene, cleanliness, and procedures beneficial to health.

Secondly, social networks for customers are a source of information about the cost of services and the opportunity to analyze real feedback.

Finally, beauty experts should use new promotional practices such as on-line AR tools. In accordance with the analyzed theoretical and practical material, it has been clearly shown that the beauty business is an extremely promising direction. It has become obvious that nowadays beauty industry is turning into the author and messenger of the best beauty patterns into people's minds.

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## **Social entrepreneurship as a driver of small towns' development**

**Abstract.** Despite a significant development of social entrepreneurship as a phenomenon throughout the 20th century, the theoretical development of this concept is still in its infancy. In this regard, within the framework of our research, we identify the characteristics of social entrepreneurship as a factor in the development of small towns and determine its place in the institutional framework that form the conditions for ensuring the quality of life in small towns. Our findings make it possible to characterize and systematize theoretical approaches, to identify the key functions and the importance of social entrepreneurship as a producer of public goods in small towns.

**Keywords:** social entrepreneurship, small towns, territorial development, social value.

### **Introduction**

The 2020 COVID-19 pandemic had an impact on migration flows, leading to an increase in atypical migration processes, primarily to a massive outflow of citizens to out-of-city spaces. Particularly to small towns. At the same time, the specific socio-economic context of such areas is a new challenge. For example, it is often not profitable for “classical” businesses and government to go to small towns because of smaller demand compared with nearest megapolities, that is why social enterprises can be a driver of small towns' development.

Social entrepreneurship is a special form of organization at the intersection of charity (in terms of primary focus on solving social problems) and business (in terms of applying a market approach to management). According to the definition of the Our Future Foundation [9], the criteria for social entrepreneurship are innovativeness; entrepreneurial approach; social impact; scalability; self-sufficiency and financial stability.

At the same time, despite the significant development of social entrepreneurship throughout the 20th century, the theoretical development of



this concept is still in its infancy. In this regard, within the framework of our research, we identify the characteristics of social entrepreneurship as a driver of small towns' development and determine its place in the institutional framework that form the conditions for ensuring the quality of life in small towns.

## Theoretical review

There are main scientific approaches to the development of territories (small towns) that describe the problems in small towns. These approaches will help to show how these problems can be solved through social entrepreneurship rather than other forms of organization.

Prospects for the development of small towns are widely presented in the studies of several scientists headed by N. Pokrovsky, who formulated the idea of a "focal economy". The focal economy does not strive for total territorial development. On the contrary, territorial development occurs only to the economically rational extent.

Secondly, there is a changing role of small towns' women. It is noted that small towns' (and rural) women are often in the least favorable position. Some areas, such as access to productive resource, are of paramount importance for the standard of living of small towns' households, but, as a rule, are not considered from a gender perspective [8].

Thirdly, another significant factor for understanding the development of territories is the changing role of the "big city" in relation to small towns' development. For example, in the Nevelsky District of the Pskov Region, 7500 residents account for 4000 summer residents in the summer, 70% of whom are from Moscow and Saint-Petersburg [7, p. 58].

These are just a few proofs of the importance of small towns' development. But everybody knows that social problems could be solved in different ways. For example, by government, by corporate social responsibility or by charity. So, why is social entrepreneurship the most productive way?

To begin with, the main producer of public goods and the solver of social challenges is the government (especially in case of Russia). But according to New Public Management theory, one of the problems is such phenomena as "state failures". A problem that was first described by A. Marshall, A. Pigou, J. Stiglitz, R. Coase, and others.

Second, corporate social responsibility (CSR) is often unavailable or not enough. Particularly, in Russia nearly 100 corporations provide CSR policy, but the number of social problems and of small towns is many times more (Yu.N. Arai, T.A. Burmistrova). The same is true of charity.

Finally, social entrepreneurship in small towns is a really good tool for using the favorable social capital of local communities of small towns for their development with commercial affects (A.A. Auzan, V.L. Tambovtsev, S.G. Kirdina, E.N. Nikishina, A.Alesina, P. Giuliano, G. Hofstede, S. Shane).

**Empirical research base**

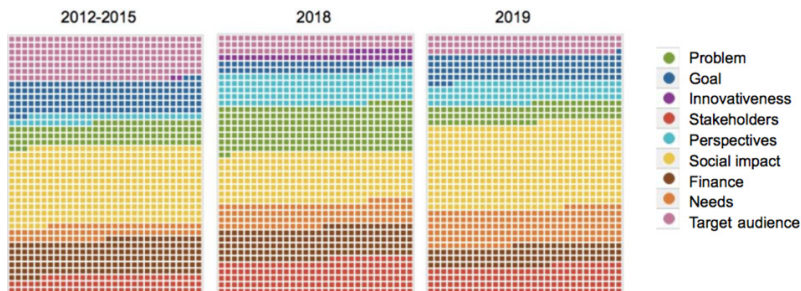
Like most institutional phenomena, the ongoing institutional changes in the field of social entrepreneurship require the involvement of various stakeholders. In this regard, a better way is using qualitative methods. Target group of future research is described in Table 1.

*Table 1*

**Characteristics of the research object**

Object (who?)	Method	Goal	The role of the research object
1	2	3	4
Leaders and team of social enterprises	Semi-formalized interview	Determine the dominant values and attitudes, the socio-cultural characteristics of the initiators of the social enterprises.	A key actor in the development of the social entrepreneurship sphere
Society (citizens)	Questionnaire	Determine the attitude to social entrepreneurship, their possibilities of participation in social enterprises.	Potential consumers of social enterprises.
Leaders and members of institutions (foundations, accelerators, government agencies)	Semi-formalized interview	Determine the dominant values and attitudes, socio-cultural characteristics of the subjects of support	A key actor of state policy in social entrepreneurship

To formulate hypotheses of main future research, we conducted test content analysis. Purpose of our test content analyses: to identify the features of social entrepreneurship in small towns and problems that social entrepreneurs face. Target group of test content analyses are social entrepreneurs — members and partners of the Our Future Foundation. The base of articles consists of mini-reports for 3 periods — 2012–2015 (25 cases), 2018 (19 cases), 2019 (23 cases).



**Figure 1.** Results of content analyses

We find that social orientation still prevails in solving social problems. As a result, we show that influence of stakeholders is increasing and the share of orientation towards the target audience decreases, which again indicates more of a social than an entrepreneurial orientation.

As an additional result of content analyses, we find three groups of problems that social entrepreneurs face: power distance; lack of funding; depressive context of small towns (bad roads, infrastructure, etc.). Social entrepreneurs' perception is important here, because formal institutes of support often exist in small towns, but citizens do not know about them or feel controversial with the local state.

## Recommendations

Social entrepreneurship activities support should come not only from the state, but also from society. Several authors, for example, V. Barinova [4, p. 48], believe that support of social entrepreneurship by society (through various funds, grant programs, crowdfunding) is a more productive way. The possibility of maximum consideration of the opinion of “voters”. Because of greater flexibility of financing from society.

When we talk about society context, it is also interesting to research the framework of the socio-cultural factors:

- (1) kind of relationship between public institutions and social enterprises
- (2) level and kind of trust in society (in case of widespread crowdfunding platforms and volunteer assistance to social enterprises).

Socio-cultural characteristics of the Russian society as a high-power distance, avoidance of uncertainty, low masculinity, individualism at the median level, an orientation toward the “win-lose” strategy (according to Hofstede) can potentially block institutional changes in the field of social entrepreneurship in the Russian Federation.

Here we can draw an analogy with an approach based on the idea that there are societies, culture and values that contribute to the development of entrepreneurship and innovative activity [2, p. 201] (along with an inclusive system of institutions and economic incentives). On the other hand, a clear feature of the Russian society is an orientation towards the values of collectivism, rather than individualism (“we”, not “me”). It can be a favorable factor of social entrepreneurship development in our country, particularly in small towns.

In conclusion, we can say that it is supposed to use the research results in assessing the feasibility of institutional changes aimed at developing social entrepreneurship and improving the quality of life in small towns. The main planned practically useful result is the identification of socio-cultural characteristics for “fine tuning” the emerging formal institutions in the field of social entrepreneurship in the Russian Federation.

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## **Platform economy in China. Sino-Russian cooperation**

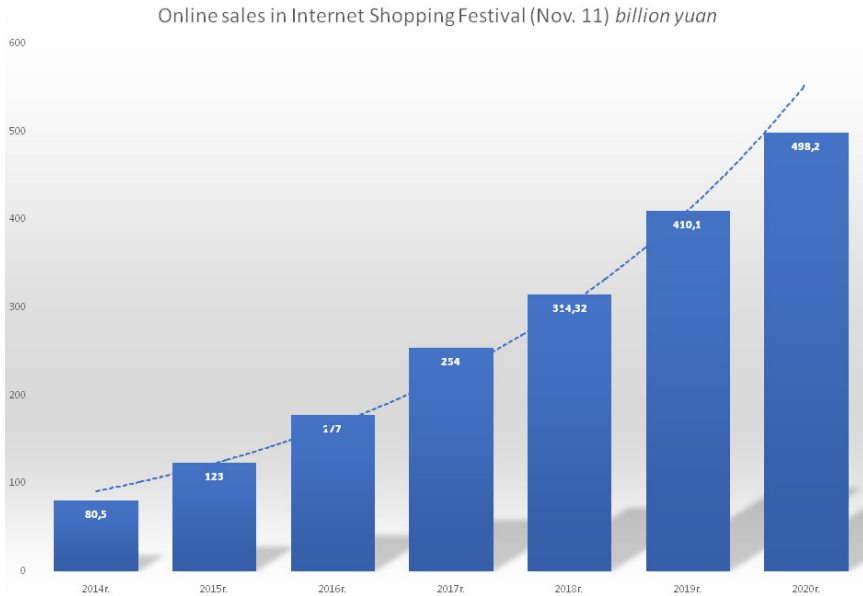
**Abstract.** In recent years, the platform economy based on the Internet, big data and digital technology, is growing rapidly. In China, the platform economy is recognized as a future direction for economic development and technology research. In this work we introduce the current situation and future trend of China's platform economy, analyze its characteristics. Apart from common characteristics of platform economy, such as bilateral externalities and dependencies, China's platform economy has its own specific advantages and problems. On the one hand, it has multitudinous internet-users as a solid basis which has been integrated with many economic sectors. On the other, digital divide, monopoly and unfair competition have impacted China's platform economy adversely. The analysis concludes with a close examination of China-Russia cooperation in this area.

**Keywords:** platform economy, China, e-commerce, Sino-Russian cooperation.

The platform economy is an increasingly global ecosystem-based on digital technology, which is composed of data-driven, open platform-supported and network-coordinated economic activities [2, pp. 14–18]. It is a more efficient economic model. By creating a certain platform, a multilateral market is formed, breaking down the barriers of the traditional single market.

The platform economy constantly changes traditional industries, creates new business models, and defines new trends in global industrial and technological development. Moreover, in China, the platform economy is recognized as a future direction for e-commerce development and technology research.

In recent years, the platform economy in China has rapidly developed. As an emerging business model, the platform economy has become an indispensable part of the modern economy in China. According to the data of White Book on the Development of China's Digital Economy in 2018, the internet platform company provided more than 60 million work positions; in the first half of 2019, the online retail sales of consumer goods were reached 3816.5 billion yuan, increased by 21.6% year-on-year, which is almost 20% of total retail sales. In the internet shopping festival (11 Nov.) in 2020, 31.4 million people have purchased online and the total amount of turnover was 498.2 billion yuan [3, pp. 14–15].



Data source: Tmall.com

Since there are so many platform companies and the platform economy is growing rapidly, what do they have in common?

- (1) *Scale-effect*. The marginal cost of a platform is extremely low or even close to zero. As the number of users who join the platform increases, the total cost of the platform does not change much, but the average cost will be significantly reduced. In the e-commerce platforms, search engine, this character is most prominent.
- (2) *Externality*. Arthur Cecil Pigou, English economist from the Cambridge School, described the concept of “externality” in the 1920s, which means that economic activities of one entity can have an impact on others [1, pp. 77–79]. For example, the more interesting the content (articles, news) presented by media platforms (websites, magazines, and newspapers) is, the more readers they can attract; the more readers, the more high-quality publishing content writers will create on the platform.

In addition, the Chinese platform economy has its own unique advantages.

1. Strong internet user base. As of December 2020, China’s internet users reached 989 million, mobile phone users reached 986 million, internet penetration rate is 70.4%.
2. Cross-border integration and multidisciplinary expansion. A lot of platform companies often use strategies that combine their own platforms with

functions of related areas. For example, Baidu as a search engine company not only holds about 80% of the market share in the search area, but also provides e-commerce and location services on mobile devices through Baidu Nuomi, Baidu map, Baidu finance and other products. Xiaomi Technology itself is a mobile internet platform enterprise based on mobile phone selling and operating systems, and in recent years it has gradually entered the markets of TV Box, smart home equipment, virtual reality, and other areas.

No doubt that China's platform economy has its own problems and drawbacks, such as:

- (1) a huge gap in the level of economic development of the platform between different regions and different industries;
- (2) monopoly and unfair competition.

For a stable position on the market, platform companies often expand through price wars with others. When a price war gets endless, platform companies or their investors often decide to form a new monopoly platform by mergers or acquisitions. For example, Meituan and Dazhongdianpin merged into Meituan Dianping in 2015, becoming the largest O2O platform in China. But it is universally acknowledged the monopoly has bad affection on fair competition, and the platform might not optimize if they become the only one in its area.

China and Russia have historical experience in the field of traditional trade. The development of the platform economy in the new era will also contribute to the modernization of traditional trade. Integrating the traditional production and market resources, the platform can provide a space for the development of the two countries' economies and promote the innovation and transformation of trade models. In more detail, the platform economy develops various business models such as B2B, B2C, C2C, and O2O between China and Russia, links production and consumption between the two countries, which consistently and efficiently increases the scale of trade between the two countries.

At the same time, the emerging consumer service platforms in the areas such as tourism, sports, and cultural consumption, are also highly concerned. The information technology should be applied in the two countries' culture, sports, tourism, education, medical care and smart home, and the e-commerce should be used to widen the bilateral markets of the digital film and television, digital music, network art etc. We believe that the people of two countries will benefit from this.

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## **Fiedler's model of leadership effectiveness and its application (evidence from fire and rescue unit of EMERCOM of Russia)**

**Abstract:** The paper considers the problem of staff turnover in the fire and rescue unit of EMERCOM of Russia. The author uses Fiedler's model of leadership effectiveness to assess the existing relationships within a team and determine the most successful team management style. The report contains the data obtained from a comparative analysis on the staff level, the relationship between the personnel and the unit commander, the structure of the tasks set and unit commander power. The author concludes with an examination of the reasons and motives for resignation, as well as the actions of the unit commander to prevent any conflicts. The findings may be used in recommendations to improve leadership effectiveness.

**Keywords:** Fiedler model, rescue center, effective leadership, effective management style, fire and rescue unit.

Service in departments of EMERCOM of Russia is hard, scrupulous, and responsible work, which requires special psychological qualities, practical skills, and physical training. When candidates enter the service, they undergo a serious selection process in terms of both physical and psychological status [3, p. 63].

To efficiently perform the tasks of protecting the population and territories against emergencies it is necessary to provide a full set of fire and rescue units. In the researched fire and rescue unit, staff is incomplete (Table 1). In the last 1,5 years 4 people have resigned from the fire and rescue unit and 1 (firefighter-rescuer) has applied for a transfer.

*Table 1*

**The number of members of the fire and rescue unit**

Position	Required number	Actual number
Unit commander	2	2
Firefighter driver	3	1

Position	Required number	Actual number
Firefighter rescuer	6	6
Chief Firefighter rescuer	3	0
Team commander	5	5
Chief motorist rescuer	1	1
Pipefitter driver (rescuer)	9	4
Chief Pipefitter driver (rescuer)	1	1

It can be concluded that there is a problem of staff turnover. This leads to an unstable shift schedule, performance of other staff job duties, and increasing dissatisfaction on the part of the personnel.

During the research, a survey was conducted to identify the cause of the problem. The team of the fire rescue unit was interviewed (research 1–7). The number of respondents was 17 people (n=17).

**Research 1:** 35,3% of the personnel are of 29–35 years old; 35,3% of 21–28 years old; 29,4 % between 18 to 20 years old.

**Research 2:**

Experience in the structures of the EMERCOM of Russia	%
Less 1 year	23,5
Than 1–4 years	23,5
5–10 years	23,5
10–20 years	29,4
Over 25 years	—

**Research 3:** the reasons for resignation/reassignment are: low salary (17,6%), poor logistical support (5,9%), management conflicts (5,9%), still working (76,5%), others (5,9%).

**Research 4:** more than half have considered quitting — 52,9%

**Research 5:**

Qualities of unit commander (employee feedback)	Value of research (max. value — 85)
Endurance	24
Discipline	36
Persistence	35
Novelty of thought	39
The ability to multitask	24
Self-sufficiency	28

**Research 6:** the effectiveness of the unit commander has been evaluated: “excellent” — 11,8%; “satisfactory” — 11,8%; “unsatisfactory” — 76,4%.

**Research 7:** the personnel is dissatisfied with their unit commander 88,3% vs. 11,8%.

Based on the above data, it follows that the officers in this unit are dissatisfied with their leader (Res. 7), more than half have considered resigning (Res. 4). Reasons for this may be the low level of leadership qualities of the unit leader (Res. 5), poor performance in achieving objectives (Res. 6), small salaries and poor logistical support (Res. 3).

To solve the researched problem, it was decided to apply F. Fiedler’s situational model [2, p. 128].

Before using the Fiedler model, the type of management of the current unit commander had to be determined. He was given a questionnaire where he rated the least preferred co-worker (LPC) on a scale designed by Fiedler. The officer was asked to recall one of the employees or subordinates with whom he had ever had the most difficulty working with and to mark the points corresponding to his characteristics on the scale [1, p. 135]. The results obtained are presented in Table 2.

*Table 2*

### **Characteristics of the least preferred co-worker**

<b>Characteristics</b>	<b>Score</b>	<b>Characteristics</b>
Unpleasant	5 out of 8	Pleasant
Hostile	4 out of 8	Friendly
Rejecting	2 out of 8	Receiving
Tension	4 out of 8	Relaxed
Cold	4 out of 8	Warm
Boring	5 out of 8	Interesting
Conflict	3 out of 8	Harmonious
Gloomy	5 out of 8	Funny
Stealthy	4 out of 8	Open
Sneaky	4 out of 8	Trustworthy
Unreliable	4 out of 8	Reliable
Inattentive	2 out of 8	Attentive
Nasty	4 out of 8	Cute
Disagreeing	2 out of 8	Agreeing

Characteristics	Score	Characteristics
Insincere	4 out of 8	Sincere
Wicked	2 out of 8	Kind

The final score ranges from 18 (most negative) to 144 (most positive). An overall high score indicates a relationship-oriented leader. Whereas a low score indicates a task-oriented one. In our case,  $LPC = 67$ , which indicates that the unit commander's type of leadership is rather task oriented.

F. Fiedler distinguished the three main parameters that could affect the working situation:

- (1) the type of interaction between the leader and subordinates;
- (2) the structure of the task;
- (3) the form of the leader's power and the amount of this power.

Through the application of these parameters, any working situation can be assessed. All the parameters are combined to form eight basic situations in which any manager may occur. These situations are classified as very favourable (1–3), moderately favourable (4–6), and very unfavourable (7, 8) for the manager (Fig. 1).

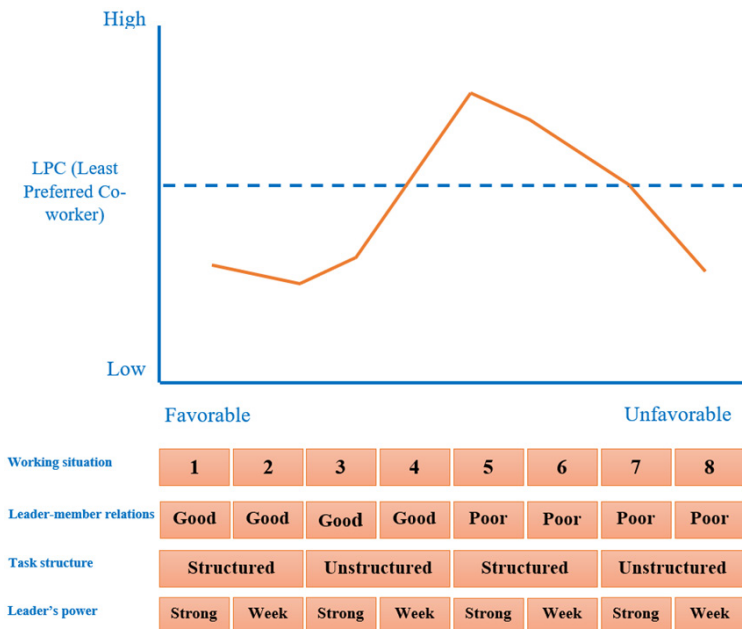


Figure 1. Fred Fiedler's model of leadership effectiveness

Based on the survey data, the majority of employees in the Fire and Rescue Unit of the Nevsky Rescue Centre want a change of the current unit commander. The tasks performed during the service are well-structured, and the position of the unit commander is strong, as in paramilitary structures the personnel of the rescue center live by the statute, and failure to comply with the orders of senior management entails disciplinary sanctions, up to a dismissal from the service. Consequently, our case is 'situation 5' according to Fiedler and it is moderately favourable.

In cases where the relationship between the company commander and the personnel belongs to Situation 5, personal relations-oriented leaders have success, so we can conclude that to improve leadership effectiveness, the current unit commander should focus on his subordinates. This would build trust with the employees and thereby increase their willingness to interact. For example, he or she can begin to show empathy to the subordinates and care for them. The use of motivational techniques and stimulation of interest in performing the tasks could reduce the need for close supervision and minimize the risk of losing control. If the manager continues to be authoritarian, however, there is no chance of success in this team.

The work in the rescue centers of the Russian Ministry of Emergency Situations requires maximum concentration on the personnel and quality of the tasks performed, as lives of people may directly depend on that. To improve the situation in the researched team, several measures have been proposed: training in team and manager interaction, team building, retreats and all possible activities to improve interpersonal relations.

Unit commanders using an authoritarian and task-oriented management style will be successful in situations 1–3, 8, and ineffective in situations 4–6 according to Fiedler. In situation 7, both authoritarian and personal relations-oriented leaders will be effective.

Consequently, when working with personnel, the successful unit commander will need to be able to combine different leadership styles to effectively achieve the desired outcome.

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