

DEVELOPMENT OF A PLATFORM ECONOMY IN RUSSIA: POSSIBLE NEGATIVE CONSEQUENCES FOR THE SIBERIAN AND FAR EASTERN REGIONS

РАЗВИТИЕ ПЛАТФОРМЕННОЙ ЭКОНОМИКИ В РОССИИ: ВОЗМОЖНЫЕ НЕГАТИВНЫЕ ПОСЛЕДСТВИЯ ДЛЯ СИБИРСКИХ И ДАЛЬНЕВОСТОЧНЫХ РЕГИОНОВ

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In the national project “Digital Economy of the Russian Federation” it is noted that the state will support the creation of leading platform companies. However, the project and numerous scientific comments on this project do not explain the possible socio-economic consequences of the development of the platform economy for certain groups of Russian regions. To develop regional development strategies, first of all, it is necessary to know the negative consequences. Therefore, the purpose of the study was to identify possible negative consequences of the platform economy development for the regions of the Siberian and Far Eastern Federal districts of Russia. The analysis of the global array of scientific publications on platform economics in comparison with the peculiarities of the socio-economic development of Siberia and the Far East has revealed five possible negative consequences: concentration of platform companies in the capital of Russia; polarization of the economic space; transformation of regional labour markets; increase in migration flows and chaotic spatial diffusion of innovations. Qualitative estimates were obtained for these consequences. Future products and services with ultra-low signal delay in 5G networks (Tactile Internet, holographic calls, etc.) were selected for a quantitative assessment. Calculations of the signal delay between 196 cities in Siberia and the Far East have showed that it will be possible to create six territorial digital platforms. The business ecosystems that can be created around these platforms can cover 52 cities. The rest of the cities will find themselves without access to new products and services. This will create a future digital inequality that will cover 260 times more people than the current inequality in access to 3G–4G networks. The results can be used to refine the national project

Key words: digital economy; platform economy; regional development; telecommunication network; ultra-low signal delay; city; region; digital divide; Siberian Federal District; Far Eastern Federal District

В национальном проекте «Цифровая экономика Российской Федерации» отмечено, что государство поддержит создание платформенных компаний-лидеров. Однако в проекте и в многочисленных научных комментариях к этому проекту не объясняются возможные социально-экономические последствия развития платформенной экономики для отдельных групп российских регионов. При разработке стратегий регионального развития в первую очередь необходимо учитывать возможные негативные последствия развития платформенной экономики для регионов Сибирского и Дальневосточного федеральных округов России, их выявление и стало целью исследования. Анализ мирового массива научных публикаций по платформенной экономике в сопоставлении с особенностями социально-экономического развития Сибири и Дальнего Востока позволил определить пять возможных негативных последствий: концентрацию платформенных компаний в столице России, поляризацию экономического пространства, трансформацию региональных рынков труда, увеличение миграционных потоков и хаотизацию пространственной диффузии инноваций. Этим потенциальным явлениям дана качественная оценка. Для количественной оценки выбраны будущие продукты и услуги со сверхмалой задержкой сигнала в сетях 5G (Тактиль-

ный Интернет, голографические звонки и др.). Расчеты задержки сигнала между 196 городами Сибири и Дальнего Востока показали, что можно будет создать шесть территориальных цифровых платформ. Бизнес-экосистемы, которые могут быть созданы вокруг этих платформ, способны охватить 52 города. Остальные города окажутся вне доступа к новым продуктам и услугам. Это сформирует будущее цифровое неравенство, которое охватит в 260 раз больше населения, чем современное неравенство в доступе к сетям 3G–4G. Полученные результаты могут использоваться для уточнения национального проекта

Ключевые слова: цифровая экономика; платформенная экономика; региональное развитие; телекоммуникационная сеть; сверхмалая задержка сигнала; город; регион; цифровое неравенство; Сибирский федеральный округ; Дальневосточный федеральный округ

Introduction. Initial understanding of the digital economy [22; 33] has transformed into many different opinions and definitions [8]. Recently, the prevailing point of view is that digital platforms are at the heart of the digital economy [10; 34]. According to the most general definition, platforms “function as an interface between different groups of users and facilitate value-creating exchanges” [6, p. 1331]. Digital platforms have begun to affect all types of human activity. To understand this phenomenon, new concepts such as “platformization” [23], “platform revolution” [24], “platform society” [36], “platform power” [11], “platform capitalism” [30], “platform cooperativism” [27], “platform urbanism” [19] and “platform logic” [28] have appeared in the scientific literature. In economic research, the new phenomenon is called “platform economy” [10; 17; 28; 29; 31]. One of the scientific reviews [21] states that the first publications on the platform economy appeared in the early 2000s. In another study [28] it is proposed to count from the publication of D.S. Evans et al. in 2006 [9]. If you “dig deeper”, many of the provisions of the platform economy are based on the research of M.L. Katz and C. Shapiro on network externalities [16], which was published in 1985. A significant theoretical contribution to the foundation of the platform economy was made by research on “two-sided markets” (the platform is used for interaction between two groups of users who are sellers and buyers) [2; 25] and “multi-sided markets” (advertisers, investors, and other new groups are added to the previous two groups) [10; 15]. A separate research area is the study of business ecosystems that are formed around digital platforms [1; 13; 35]. New ideas are also generated in leading platform companies (Airbnb, Alibaba, Alphabet, Amazon, Apple, Baidu, eBay, Facebook, Netflix, Tencent, Uber, etc.).

In recent years, several strategic documents on the development of the digital economy have been adopted in Russia, in which,

among other things, the attention is paid to the platform economy. The government program “Digital Economy of the Russian Federation” was approved in July 2017 (Order of the Government of the Russian Federation of July 28, 2017 No. 1632-r). This program has become the basis for the development of the national project, the passport of which was approved in December 2018 and published in February 2019. The national project was concretized in six federal projects (“Regulatory Regulation of the Digital Environment”, “Personnel for the Digital Economy”, “Information Infrastructure”, “Information Security”, “Digital Technologies” and “Digital Public Administration”), approved in May 2019. According to the national project, “at least 10 leading companies (ecosystem operators)” and “at least 10 industry-specific (industrial) digital platforms” should be created in 2020–2024. The Russian scientific community is actively discussing the national project (as of October 1, 2020, 657 journal articles on this topic were recorded in the eLIBRARY.RU Scientific Electronic Library). However, this set of publications does not contain scientific results that characterize the socio-economic consequences of the development of the platform economy for certain groups of Russian regions.

When forming regional development strategies, first of all, it is necessary to know the negative consequences. This will make it possible to develop regional programs to eliminate or reduce such consequences. In our study, the Eastern regions of Russia were selected as the analyzed territory, since there are numerous socio-economic data on this territory in the Institute of Geography named after V.B. Sochava of the Siberian Branch of the Russian Academy of Sciences (IG SB RAS). Therefore, the purpose of the study is to determine the possible negative consequences of the development of the platform economy for the Siberian and Far Eastern regions. Since the platform economy

has just begun to form in Russia, it is necessary to determine a list of potential negative consequences based on an analysis of the national project, a literature review and clarification of the socio-economic characteristics of the Eastern regions. This will be a qualitative assessment. Quantification is possible if statistics are available for a particular type of future digital service. Previous studies [5] have made it possible to identify this type of service. It is associated with ultra-low signal latency in 5G networks (Tactile Internet, holographic calls, etc.) [18; 20].

Materials and methods. Global array of publications (the following databases were analyzed: www.link.springer.com, www.onlinelibrary.wiley.com, www.sciencedirect.com, www.journals.sagepub.com, www.ideas.repec.org, www.login.webofknowledge.com, www.scopus.com, www.elibrary.ru) and data from the IG SB RAS were used to compile a list of potential negative consequences. Cities, in which access to services with ultra-low signal latency is possible, were determined on the basis of the author's database for Russian telecommunications lines (compiled from reports of all telecom operators as of January 1, 2020). The algorithm for identifying such cities was developed by the author earlier [5]. The socio-economic significance of the selected cities was calculated by the number of their citizens (data from the Federal State Statistics Service were used as of January 1, 2020 [7]).

It is generally accepted that digital platforms are extraterritorial [24]. However, this applies primarily to global platforms. Local and regional platform companies offer products and services within a specific territory. There are no concepts of identifying such territories in the world science. Municipal or regional borders are usually used [12; 14]. This is incorrect, since the zones of platform influence can unite fragments of different municipalities and regions. To solve this problem, the author's concept of a "territorial digital platform" was used [4]. According to the concept, a large city (more than 250 thousand inhabitants) was singled out and the signal delay value was calculated relative to it (the formula is given in [18]) to all other cities. The area of a large city influence included only those neighboring cities, to which the signal delay in fiber-optic networks was extremely low (less than 1 millisecond). This allows you to place a digital platform in a large city in the future and form an ecosystem of users of the Tac-

tile Internet and related services (in real time). Since the national project plans to develop 5G networks only in territories with a population of more than 1 million people, our study identified groups of cities with such a number of citizens. This means that all cities that are not included in the groups will be left without services with ultra-low signal latency. From here, you can calculate the consequences of creating platform companies in large cities for each region. Negative consequences were quantified by the total number of citizens without access to new types of services.

Results and discussion. Our study assessed the potential impact of the platform economy on the socio-economic development of 21 regions (Republic of Altai, Republic of Buryatia, Republic of Sakha (Yakutia), Republic of Tuva, Republic of Khakassia, Altai Territory, Trans-Baikal Territory, Kamchatka Territory, Krasnoyarsk Territory, Primorye Territory, Khabarovsk Territory, Amur Region, Irkutsk Region, Kemerovo Region, Magadan Region, Novosibirsk Region, Omsk Region, Sakhalin Region, Tomsk Region, Jewish Autonomous Region and Chukotka Autonomous Area). Analysis of the national project and global experience in platform research has revealed five Russian features that in the future may have a negative impact on the Siberian and Far Eastern regions.

The first possible negative consequence of the platform economy development in Russia may be the concentration of platform companies in the capital. The national project notes that the state will support the creation of 10 domestic leading companies. All major Russian state-owned companies are headquartered in Moscow and pay almost all taxes there. Most likely, the new leading platform companies will be localized in Moscow, and their ecosystems will cover all Russian regions. It is possible that leading companies will be created in various sectors of the digital economy and become monopolists in them. The development of platform companies indicates their desire to implement the "winner-takes-all" strategy [26]. With this development of events, platform companies through their ecosystems will make a profit in the Eastern regions, and pay taxes in the capital. This will contribute to a sharp decline in regional budgets, which are currently supported mainly by regional companies and territorial clusters.

The second negative consequence can be associated with the polarization of the economic

space. At present, Russia's economic space has been already polarized. Economic activity is concentrated mainly in urban agglomerations, most of which are located in the Western regions. The platform economy development will facilitate the concentration of companies in the capital region and surrounding regions, which will lead to an even greater polarization of space. Companies from the Eastern regions will have to enter the ecosystems of leading companies from the Western regions with the further prospect of absorbing the first by the latter. Since these processes are not regulated in any way in the national project for the development of the digital economy, the Eastern regions may eventually be left without their own platform companies at all. This can be called modern digital colonization, in which the Eastern regions will only supply data, and companies in the Western regions will process this data and develop.

The third negative consequence may be the transformation of regional labour markets. The labour platforms' development and the transition to remote work are changing employment in countries and regions [37]. In a platform economy, specialists with unique skills will receive higher salaries than they are currently, and low-skilled workers will become even poorer, as switching to temporary contracts will deprive them of their current social guarantees. For the Siberian and Far Eastern regions, this will lead to an increase in hidden unemployment, while in the Western regions this process will be mitigated by greater economic diversification. Platformization will also facilitate the closure of small service and retail companies in the Eastern regions, and new companies will be created closer to the capital, which will increase unemployment in Siberia and the Far East.

The fourth consequence may be an increase in migration flows. Now in the East of Russia there are flows of migrants from the periphery to regional centers and from regional centers to the Western regions. The development of the platform economy will help strengthen the so-called digital migration. As a result, highly qualified IT-specialists will move permanently to the Western regions (closer to the capital), where it is easier to find new and/or additional jobs in the conditions of economic turbulence. An increase in the outflow of population from Siberia and the Far East will have a negative impact on the entire economy.

The fifth negative consequence of the development of the platform economy can manifest itself in the chaotic spatial diffusion of innovations. The national project does not have a regional policy for spreading platform innovations. This would not matter with a single type of spatial diffusion. However, there are three types [3] and each of them has its own "spatial logic". If these processes are not regulated, then innovations waves will be directed to some regions, bypass other regions, and collide in third regions. As a result, there will be chaos, which will intensify with distance from the capital, since the leading platform companies will close innovation flows among themselves within Moscow, and the spread of innovations throughout the rest of Russia will be carried out randomly.

One of the ways to neutralize possible negative consequences is the formation of multi-sided territorial digital platforms in the regions as well as the formation of regional business ecosystems around them [4]. As a result of the study, it was found that six territorial digital platforms can be formed in the Siberian and Far Eastern regions (Table 1). This number of platforms is associated with the existing settlement system, the existing telecommunications network and the presence of at least 1 million people in the area of each platform influence. If in the distant future 5G networks start to be deployed in territories with a population of 0.5 to 1 million people, then digital platforms can be created in Barnaul, Kemerovo, Tomsk and Khabarovsk.

The socio-economic significance of the six platforms can be roughly estimated by the number of cities and urban populations that will have access to services and products with ultra-low signal latency. The study has found that in Siberia and the Far East, more than half of the population will not have access (in real time) to such services and products (Table 2). If we consider access for each region, the most favourable situation is in the Omsk Region (only the city of Tara is outside the influence of the platform). In four regions, the platforms can cover cities around regional centers (Novosibirsk, Krasnoyarsk, Vladivostok, and Irkutsk). A relatively unique situation has turned out in the Kemerovo Region, where the regional center (the city of Kemerovo) and the surrounding cities are out of access to the Novokuznetsk digital platform. All cities in the other 15 regions will not have access to the six platforms.

Table 1 / Таблица 1

A number of cities and urban population in areas of ultra-low signal delay from territorial digital platforms in Siberia and the Far East (as of January 1, 2020)/ Количество городов и численность городского населения в зонах сверхмалой задержки сигнала от территориальных цифровых платформ Сибири и Дальнего Востока (на 1 января 2020 г.)

Place of platform localization / Место локализации платформы	Number of cities / Количество городов	Urban population (thousand people) / Численность городского населения (тыс. чел.)
Novosibirsk / Новосибирск	9	1891,3
Krasnoyarsk / Красноярск	9	1452,0
Novokuznetsk / Новокузнецк	13	1269,6
Omsk / Омск	6	1244,0
Vladivostok / Владивосток	7	1129,6
Irkutsk / Иркутск	8	1066,3

Table 2 / Таблица 2

Distribution of the number of cities and urban population in the Siberian and Far Eastern regions, taking into account the presence or absence of ultra-low signal delay from digital platforms (as of January 1, 2020) / Распределение количества городов и численности городского населения по сибирским и дальневосточным регионам с учетом наличия или отсутствия сверхмалой задержки сигнала от цифровых платформ (на 1 января 2020 г.)

Regions / Регионы	Territory with ultra-low signal delay from platforms / Территория со сверхмалой задержкой сигнала от платформ		Other territory / Остальная территория	
	Number of cities / Количество городов	Urban population (thousand people) / Численность населения (тыс.чел.)	Number of cities / Количество городов	Urban population (thousand people) / Численность населения (тыс. чел.)
Republic of Altai / Республика Алтай	0	0	1	64,5
Republic of Buryatia / Республика Бурятия	0	0	6	521,3
Republic of Sakha (Yakutia) / Республика Саха (Якутия)	0	0	13	523,0
Republic of Tuva / Республика Тыва	0	0	5	147,3
Republic of Khakassia / Республика Хакасия	0	0	5	334,4
Altai Territory / Алтайский край	0	0	12	1248,2
Transbaikal Territory / Забайкальский край	0	0	10	515,9
Kamchatka Territory / Камчатский край	0	0	3	241,2
Krasnoyarsk Territory / Красноярский край	9	1452,0	14	594,4
Primorye Territory / Приморский край	7	1129,6	5	186,2
Khabarovsk Territory / Хабаровский край	0	0	7	970,6
Amur Region / Амурская область	0	0	10	463,6
Irkutsk Region / Иркутская область	8	1066,3	14	603,8
Kemerovo Region / Кемеровская область	13	1269,6	7	839,7
Magadan Region / Магаданская область	0	0	2	96,4
Novosibirsk Region / Новосибирская область	10	1914,7	4	112,9
Omsk Region / Омская область	5	1220,6	1	28,2
Sakhalin Region / Сахалинская область	0	0	24	360,5

End of the table

Tomsk Region / Томская область	0	0	6	773,1
Jewish Autonomous Region / Еврейская автономная область	0	0	2	80,2
Chukotka Autonomous Area / Чукотский автономный округ	0	0	3	25,8
Total / Всего	52	8052,8	144	8731,2

If the data in Table 2 are interpreted as the future digital inequality in the era of the Tactile Internet and 5G networks, then this inequality will be significantly greater than it is now. In the Siberian and Far Eastern Federal Districts, as of January 1, 2020, there were 190 cities with a connection to the unified fiber-optic network of Russia and 6 cities (Anadyr, Bilibino, Verkhoyansk, Pevek, Severo-Kurilsk and Srednekolymsk) were without such a connection (they were connected via satellite). Hence, the existing digital inequality is estimated at about 3.1% for the number of cities and 0.2% for the urban population. If 5G networks were formed on the same date and services with ultra-low signal latency were provided, the inequality would be 73.5% for the number of cities and 52.0% for the population. Based on these data, it can be assumed that the development of a platform economy in relation to new high-tech products and services will lead to an increase in digital inequality in Siberia and the Far East by 23.7 times in the number of cities and 260 times in the population.

Our study had several limitations. First, the situation with the future platform economy was projected onto the modern settlement system and telecommunications network. Perhaps in 10–20 years, the settlement and network in Siberia and the Far East will change. However, these processes are inertial, which gives rise to rough estimates. Secondly, urban-type settlements and rural settlements were outside the study. Taking these settlements into account will provide a more accurate estimate of the future digital divide. Third, the quantitative assessment was limited only to the development of regional platform companies for generating products and services with ultra-low signal latency. Other types of platform companies (for example, in the field of sharing economy [32]) were not analyzed. Fourth, the allocation of territorial digital platforms was made with a limit on the

population (at least 1 million people). Removing this limitation will allow you to look into a more distant perspective. Fifth, Siberian and Far Eastern business ecosystems, which can be formed by platform companies from European Russia, were not considered.

Conclusions. Comparison of the platform economy problems, given in the global array of scientific publications, with the peculiarities of regional development in Eastern Russia, has revealed five possible negative consequences: concentration of platform companies in Moscow, polarization of the economic space, transformation of regional labour markets, increase in migration flows and chaos of spatial diffusion of innovations. According to the author, in order to neutralize these negative consequences, it is necessary to create territorial digital platforms. However, the existing settlement system and telecommunications network will not eliminate the future digital inequality. Moreover, in Siberia and the Far East, the future inequality in access to products and services with ultra-low signal delay in 5G networks will be many times greater than the current inequality in access to 3G–4G networks.

The practical significance of our research may be related to the development of a new section "Regional Economic Policy" for the national project "Digital Economy of the Russian Federation", as well as to the formation of socio-economic development strategies in each of the 21 regions included in the Siberian and Far Eastern Federal Districts. Further research can be aimed at developing methods for quantitatively assessing the five possible negative consequences of the platform economy development, which for Siberia and the Far East received only a qualitative assessment. In future research on products and services with ultra-low signal delay, it is desirable to overcome five limitations and conduct a more complete quantitative assessment.

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