
Investment Activity in Russia's Regions

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Abstract:

Any economic system, no matter what its internal configuration is or what kind of external impact it is exposed to, needs investment for rational development. The volume and structure of investment, as well as the efficiency of the way it is used, may influence the development of both the country as a whole and its specific regions in particular.

The management of economic systems will not be thoroughgoing without the management of investment. Economic reproduction is characterized based on the rate of investment activity. Some discouraging figures posted in this context in the Russian Federation (RF), namely 8.4%, which is the share of organizations engaged in technological, organizational, and marketing innovation (Rosstat, 2017), are a clear testimony to the topicalness of the issue in question.

This paper presents an assessment of investment activity in Russia, as well as across its regions. The authors have developed a methodology for forecasting the investment-based development of regions based on the calculation of the share of investment in the gross regional product (GRP) and the use of an integral indicator which factors in the effect of various factors on investment activity in a region. A separate stage in these assessments is the calculation of an integral coefficient which reflects the impact of factors impeding investment activity.

The study's primary purpose is to assess investment activity in Russia's regions and forecast the share of investment in the GRP of the RF constituent entities based on a multi-factor model.

Keywords: investment, investment activity, economic reproduction.

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1. Introduction

The significance of investment in the various sectors of the economy is hard to overestimate, as it is investment activity that characterizes the potential to free up financial resources and direct them toward development, as well as reflects the economic expectations of potential investors.

The total volume of investment in non-financial assets in the 1st half of 2017 was about 4.4 trillion rubles (Rosstat, 2017). 98.1% of this was accounted for by investment in fixed capital, with the rest 1.9% representing investment in non-production non-financial assets. Over half (51.1%) of capital investments in fixed assets was investment in non-residential buildings and facilities, which in the 1st half of 2017 totaled 2.2 trillion rubles. 34.1% of all investment in fixed capital was investment in machinery, equipment, and transportation vehicles, and out of this 3.1% was investment in information, computer, and telecommunications equipment. Of interest was the figure related to investment in items of intellectual property – 0.15 trillion rubles or 3.7% of all investment in fixed capital. An assessment of investment based on sources of funding attests that 56% of all investment in fixed capital came out of one's own pocket. Within the structure of investment brought in, 6.2% was loans from foreign banks (268 billion rubles), which, basically, was an illustration of the trend of pessimistic sentiment among foreign partners. 13.6% (or 583 billion rubles) of investment brought in was Russia's budget funds and money from extrabudget funds. Predictable were the results of an analysis of the structure of investment based on types of economic activity. To be specific, 1.2 trillion rubles or 28.8% of the total was investment in extraction of mineral resources. The transportation sector drew 760 billion rubles or 17.7% of all investment in fixed capital. These were followed by manufacturing – 716 billion rubles and 16.7%.

Based on existing methodologies, the Russian Federal State Statistics Service (Rosstat) assesses such indicators of investment activity in Russia as investment in fixed capital, volume of construction, index of industrial production, index of production of machinery and equipment, index of production of electrical equipment, electronic and optical equipment, and index of production of transportation vehicles and equipment. For instance, based on available data, in the 1st half of 2016 investment in fixed capital dropped by 4.3%, and that in construction declined by 5.7%, versus the previous year. The index of industrial production rose by 0.4%, and that of production of machinery and equipment went up by 2.8%. Note that the index of production of electrical equipment dropped by 3.1%, and that of transportation vehicles declined by 5.4% (Rosstat, 2017).

In assessing investment activity, it helps to factor in a set of general indicators characterizing one's propensity for investment. These may include the ratio of gross savings to the gross domestic product (GDP). In 2015, the Rosstat estimated this indicator at 23.8%. These indicators also include the ratio of gross fixed capital formation to gross savings. Based on estimates from Rosstat, in 2015 this ratio was

89.7% in Russia. Among the indicators characterizing one's propensity for investment is also the ratio of investment in fixed capital to GDP. In 2015, Rosstat estimated this indicator at 20.6% (Rosstat, 2017).

One of the key objectives for investment on Russian soil is currently the replacement of worn-out machinery (this was the case with 64% of all organizations in Russia in 2016 and 72% in 2015) and automatization and mechanization of the production process (45% in 2016 and 55% in 2015). Whereas the creation of new jobs appears to form the least popular basis of investment activity: 19% of all organizations in 2016 versus 25% in 2015.

Among the RF constituent entities, at year-end 2016 the way in the relative share of organizations engaged in technological, organizational, and marketing innovation in the total pool of organizations was led by the Chuvash Republic (24.5%). Figures above the 20% mark in terms of the number of innovative organizations were recorded in the Republic of Tatarstan (21.3%) and Penza Oblast (20.1%). The Chechen Republic posted the lowest relative share of organizations engaged in innovation – 0.3%. Likewise, less than 1% was posted by the Karachay-Cherkess Republic (0.8%). The percentage of organizations of this kind recorded in the city of Moscow was just 16.1%, which, however, was greater than that posted by the city of Saint Petersburg – 14.8%. Overall across Russia, in just 19 constituent entities organizations engaged in innovation constituted more than 10% of all organizations in 2016. These figures are testimony to an extremely low level of innovative activity that is based on investment specifically.

The paper's authors pursue the following objectives: 1) to assess investment activity in Russia as a whole and across its constituent entities in particular; 2) to identify regions with positive and negative investment dynamics; 3) to determine the share of investment in fixed capital in each region's GRP; 4) to propose, based on these indicators, a methodology for forecasting the share of investment across Russia's regions.

2. Theoretical rationale

The views of most domestic scholars as to defining investment activity appear to dovetail with each other. Investment activity implies a generalized characterization of the intensity of the investment process. The category of 'investment' is, in turn, considered in different aspects. Russia's Federal Law 'On Investment Activity in the Russian Federation Carried Out in the Form of Capital Investment' (1999) defines investment as "money, securities, or some other types of property, including proprietary rights or some other rights that are subject to monetary evaluation, which are invested in objects of entrepreneurial activity and (or) some other activity with a view to obtaining profit and (or) achieving some other kind of useful effect". It is also worth noting that in Russia the terms 'investment activeness' and 'investment activity' are often used interchangeably. For its part, the latter should specifically

imply investing and performing certain practical actions with a view to obtaining profit and (or) achieving some other kind of useful effect. It, also, is not very correct to employ in this context the term 'active investment', which specifically implies a certain model for an investor's behavior (Thalassinos *et al.*, 2013; 2015; Thalassinos and Dafnos, 2015; Lukasevicius and Lapinskaite, 2014; Shekhovtsov *et al.*, 2017).

The effect of investment on economic growth has been investigated by Quaicoe *et al.* (2017), using a vector error correction model (VECM) based on quarterly time series data spanning the period 1998–2015. The study's central result is confirmation of the hypothesis that investing in free zones has a negative effect on economic growth, as opposed to investing in the country.

Some of the latest noteworthy research into investment activity within an international context is focused on Spain. A recent study analyzes Spain's latest investment dynamics within the context of trends inherent to the European Union in comparison with those observed in the UK, France, Germany, and Sweden over the period 2014–2016 (Fund, 2017; Ermakova *et al.*, 2016; Denisova *et al.*, 2017).

Other scholars have investigated the significance of higher education with respect to the level of investment activity. In their work, they suggest factoring in human capital in assessing investment activity in a country. The study produces the following key inference: teams headed by individuals with a technical education or a doctorate degree are more likely to attract investment than those with a Bachelor of Arts degree or a Humanities diploma (Ratzinger *et al.*, 2017; Pupkova, 2009; El-Chaarani, 2014; Bashmakov *et al.*, 2015; Tikhonov, 2003).

Yates and Marra (2017) have focused on investigating social return on investment (SROI). They examine issues that may arise as a result of spikes and drops in investment activity in a country and propose solutions to these (Evaluation and Program Planning, 2017). A paper by Nicholls (2017) (published in the same issue of Evaluation and Program Planning) continues the research into the issue through the lens of convergence in approaches to measuring social value.

It becomes possible to forecast investment activity in the country's regions factoring in social return on investment, which, in turn, is based on assessments of the level of social efficiency of trade in regions (as one of the major types of economic activity and a sector, the share of which in GDP is estimated at 16–18%). The grouping of RF constituent entities based on social effectiveness levels posted by Russia's regions has been performed in a paper by scholars Ivanov *et al.* (2016).

Wells and Wint (2000) compare the state's actions as part of its active investment program policies with tools of marketing, which has provided a basis for the present model for forecasting the share of investment in GRP in the context of a multifactor approach.

For the purposes of this study, the authors draw upon a classic model for factoring in nation's risks associated with choosing between exports and foreign investment, which was developed in relation to the US and proposed back in 1999 (Lehmann, 1999). This mechanism for factoring in risk in forecasting has proved solid and reliable and is, therefore, employed here as is.

Investment activity as an element of strategy for economic growth has been examined by Voronova (2004). Methods for determining investment activity in industry have been investigated by Ashirov (1999), who has proposed a set of indicators for assessing it in the sector. Investment activity within the agro-industrial complex has been researched by Kitaev (2006). The scholar has investigated the mechanism underlying state regulation of investment activity. The effect of funding as a direct condition for investment activity has been demonstrated by Tikhonov (2003). The Rosstat suggests using the following indicators of investment activity: investment in fixed capital, volume of work carried out in the construction sector, index of industrial production, index of production of machinery and equipment, index of production of electrical equipment, and index of production of transportation vehicles.

In exploring the regional aspect of the development of investment activity, it may help to analyze the share of investment in fixed capital in the GRP of the RF constituent entities. Plus, it may be worth assessing investment dynamics overall across regions. Thus, for the purposes of forecasting Russia's territorial development factoring in the general economic situation, a special methodology for forecasting the share investment in GRP may be proposed (Zaripova, 2004; Krutskikh, 2011; Kitaev, 2006; Kormishkin *et al.*, 2016; Institute for Statistical Studies and the Economics of Knowledge, 2016).

3. Methods

For the purposes of forecasting the investment-related development of regions across the Russian Federation, the authors suggest using a methodology that is based on an indicator of the share of investment in a region's GRP and an indicator that factors in the effect of factors. Below is a description of the proposed forecasting methodology. The method involves the following components:

1. The indicator of a region's projected investment-based development is calculated as the functional product of the share of investment in GRP with increments of -1 and the investment forecast coefficient.

$$I_{fi}^* = I_i * K_{fi} \quad (1)$$

where I_{fi} is a region's share of investment in the GRP for a planned period, %;

I_i is the average value of the share of investment of the i -th region in GRP over the last n periods under analysis, %;

Kf_i is the coefficient of investment forecasts for the i -th region.

The investment forecast coefficient is an integral indicator that takes account of factors with both a positive effect on investment activity in the country as a whole and in regions in particular and a negative effect which is reflected in the restraining of activity on the part of investors for a number of reasons.

2. The coefficient of investment forecasts for the i -th region (Kf) is calculated as an integral indicator of the effect of 5 major factors on investment activity in regions

$$Kf_i = \sqrt[n]{K1_i * K2_i * K3_i * K4_i * K5_i} \quad (2)$$

The following indicators are believed to influence regions' investment activity the most:

- 1) $K1$ – indicator of the degree of wear and tear on regions' fixed assets;
- 2) $K2$ – integral indicator characterizing the financial conditions for investment activity;
- 3) $K3$ – integral indicator of limiting factors of influence on a region's investment activity;
- 4) $K4$ – index of prices related to the acquisition of investment-purpose machinery and equipment;
- 5) $K5$ – balance of capital transfers.

The choice of these factors of influence is governed by many reasons. Firstly, because, as reported by Rosstat, 98.1% of all investment goes toward fixed assets, it is the indicator of the degree of wear and tear on regions' fixed assets that is the 1st coefficient of influence that is chosen.

Secondly, it helps to factor in the integral indicator characterizing the financial conditions for investment activity.

$$K2_i = \sqrt[5]{m1_i * m2_i * m3_i * m4_i * m5_i} \quad (3)$$

This integral indicator ($K2$) factors in the following coefficients:

- 1) $m1_i$ – GDP;
- 2) $m2_i$ – refinancing rate;
- 3) $m3_i$ – RF's international reserves;
- 4) $m4_i$ – composite index of prices for investment-purpose products;
- 5) $m5_i$ – official exchange rate for the US dollar against the ruble.

The methodology employing the coefficients selected is based on the Rosstat's methodology for assessing the financial conditions for investment activity. However, the authors' methodology for calculating the integral indicator (K2) is different. To be specific, the authors do not factor in total money supply in the region, the share of this money supply in GDP, as well as the share of cash. This is because most investment goes toward the extractive and processing industries sector, which is characterized by a low cash turnover. Also, to calculate the integral indicator, the authors employ only 1 index of prices, namely the index of prices for investment-purpose products.

Fourthly, the authors factor in the index of prices related to the acquisition of investment-purpose machinery and equipment (K4), which is calculated based on data on changes in the prices of manufacturers of that equipment, as well as transportation expenses, the VAT rate, and other costs.

Fifthly, it helps to factor in the balance of capital transfers (K5) as the difference between capital transfers received and provided by an institutional unit. Across the economy, this indicator equals the difference between capital transfers received from the rest of the world and provided to the rest of the world.

3. In terms of the indicator (K3) dealing with the restraining of investment activity across the country and in regions, you have to calculate its integral component:

$$K3_i = \sqrt[8]{J1i * J2i * J3i * J4i * J5i * J6i * J7i * J8i} \quad (4)$$

In computing this indicator, the methodology takes account of the following factors restraining investment-based development:

- 1) J1i – insufficient demand for the region's output;
- 2) J2i – lack of one's own financial resources;
- 3) J3i – imperfect regulatory and legal framework regulating investment processes;
- 4) J4i – complex mechanism of obtaining loans to carry out investment processes;
- 5) J5i – high interest rate on commercial loans;
- 6) J6i – investment risk;
- 7) J7i – existing regulations on the taxation of investment activity;
- 8) J8i – uncertain economic situation in the country.

The choice and line-up of these factors are governed by existing statistics on the distribution of organizations engaged in extraction of mineral resources, manufacturing, or distribution of power, gas, and water across RF constituent entities (Rosstat, 2017). The methodology factors in this kind of statistics because it is these sectors that investors are specifically prepared to invest in in the first place. This is attested to by statistics on the structure of investment based on types of

economic activity for the first half of 2017 (provided by the authors in the introduction).

To calculate each restraining factor indicator (J), the authors treat existing data on the share of organizations in the total pool of organizations as a coefficient that is equal to the share divided by 100.

4. Results

In forecasting investment activity, it helps to assess the dynamics of change in investment activity in the RF constituent entities and identify regions with positive and negative dynamics (Table 1). Overall across the country, the 1st half of 2017 witnessed a 4% increase in investment. The findings from the authors' assessment indicate that half (44 units) of Russia's constituent entities posted negative dynamics of investment in fixed capital. Note that the highest growth in investment (by several times) was recorded in Kaliningrad Oblast (150.1%), the Sakha Republic (160.1%), and Vologda Oblast (165.5%), which might be explained by the insufficient use of fixed assets during the previous periods under analysis. Vologda Oblast also has sizable investment potential from the perspective of a historically entrenched set of national-scale manufacturing brands. The city of Moscow posted a 20% increase in investment, which might also be explained by the addition of new territories to it (the development of so-called 'New Moscow') based on strategy for the further development of the nation's capital. That being said, Moscow Oblast posted a 2% decline in the volume of investment. The same dynamics were demonstrated by the city of Saint Petersburg.

Table 1. RF Constituent Entities with a Breakdown by Rates of Growth in Investment in the 1st Half of 2017 versus the 1st Half of 2016.

RF constituent entities	Growth rate, %
Lipetsk Oblast (99.6), Vladimir Oblast (99.4), Omsk Oblast (99.1), Moscow Oblast (98.1), city of Saint Petersburg (98.0), Perm Krai (93.9), Voronezh Oblast (90.7), Kirov Oblast (90.5), Oryol Oblast (80.8), Kostroma Oblast (72.6), Novgorod Oblast (62.0), Kurgan Oblast (52.0), and others	52.0 – 100.0
Karachay-Cherkess Republic (148.8), Altai Republic (147.3), Amur Oblast (147.5), Tver Oblast (145.4), Murmansk Oblast (144.7), Ryazan Oblast (136.4), Kemerovo Oblast (130.3), Arkhangelsk Oblast (128.0), Rostov Oblast (127.8), Leningrad Oblast (124.2), Republic of Mordovia (124.1), Magadan Oblast (120.2), city of Moscow (119.3), Tula Oblast (117.9), Khabarovsk Krai (116.2), Primorsky Krai (113.6), Kamchatka Krai (113.0), Republic of Karelia (110.3), Republic of Dagestan (105.1), Republic of Adygea (103.7), Irkutsk Oblast (101.0), Krasnodar Krai (100.7), Yaroslavl Oblast (100.5)	100.1 – 150.0
Kaliningrad Oblast (1.5 times), Sakha Republic (160.1), Republic of Buryatia (163.3), Vologda Oblast (165.5).	More than 150.1

Note. Data from Rosstat (2017). Calculations by the authors.

Based on calculations by way of the above model, it is possible to form a set of groups based on the relative share of investments in the GRP. Thus, for instance, one group may include RF constituent entities with shares above 1/3 of all investment in

GRP. These include Magadan Oblast with a projected relative share of 58.5%. The high figure is due to the current policy of attracting investment into the region. Quite high growth in share of investment is expected in Amur Oblast – by 17.4%. This looks like an optimistic forecast, although the basis for it is a vector policy of support for development in the Far East, which, among other things, is reflected in setting up a relevant ministry. This vector has also had an effect in terms of a planned increase of 15.9% in the relative share of investments in GRP in the Sakha Republic.

The 2nd group, the biggest of the 3, includes nearly 60% of all constituent entities with a share of investment in GRP between 15 and 30%. This kind of reference value enables the regions to stay within the boundaries of the state's general policy. The largest increase is demonstrated by Vologda Oblast (12.2%) and the Republic of Buryatia (11.2%). A decline in share of investment is projected in the Republic of Ingushetia (6.5%), Kemerovo Oblast (6%), Voronezh Oblast (3%), Zabaykalsky Krai (1.9%), and Volgograd Oblast (0.6%).

The 3rd group is made up of the city of Moscow (a projected share of 13.6%), Kostroma Oblast (12.6%), the Republic of Khakassia (11.9%), and Kurgan Oblast (8.8%).

Table 2. RF Constituent Entities with a Breakdown by Share of Investment in the 2015 GRP and Projected Values for It for 2017.

RF constituent entities	2015 share, %	2017 share forecast, %
Magadan Oblast (48.7 and 58.5), Amur Oblast (36.9 and 54.3), Karachay-Cherkess Republic (29.2 and 43.4), Altai Republic (29.2 and 43.0), Sakha Republic (26.4 and 42.3), Astrakhan Oblast (35.3 and 37.9), Murmansk Oblast (25.7 and 37.2), Republic of Dagestan (35.3 and 37.1), Tambov Oblast (34.1 and 36.8), Arkhangelsk Oblast (27.9 and 35.7), Republic of Mordovia (28.1 and 34.9), Rostov Oblast (26.4 and 33.7), Chechen Republic (36.7 and 33.4), Republic of Tatarstan (33.7 and 33.1), Leningrad Oblast (26.5 and 32.9), Tyumen Oblast (30.1 and 32.8), Republic of Kalmykia (35.1 and 32.7), Kaliningrad Oblast (21.0 and 31.7), Tver Oblast (21.5 and 31.3).	21.0 – 49%	30.1 – 59%
Vologda Oblast (18.6 and 30.8), Krasnodar Krai (30.1 and 30.3), Republic of Ingushetia (36.4 and 29.9), Voronezh Oblast (32.2 and 29.2), Republic of Buryatia (17.7 and 28.9), Zabaykalsky Krai (30.7 and 28.8), Volgograd Oblast (27.2 and 26.6), Kemerovo Oblast (20.2 and 26.3), Tula Oblast (22.2 and 26.2), Lipetsk Oblast (25.4 and 25.3), Chuvash Republic (22.3 and 23.5), Jewish Autonomous Oblast (26.8 and 23.4), Ryazan Oblast (17.1 and 23.3), Orenburg Oblast (21.8 and 23.2), Khabarovsk Krai (19.9 and 23.1), Samara Oblast (24.4 and 22.8), Ulyanovsk Oblast (26.4 and 22.8), Primorsky Krai (19.4 and 22.0), Pskov Oblast (20.6 and 21.9), Penza Oblast (26.5 and 21.7), Sakhalin Oblast (29.1 and 21.7), Kaluga Oblast (27.7 and 21.5), Bryansk Oblast (23.1 and 21.4), Kabardino-Balkar Republic (22.6 and 20.7), Irkutsk Oblast (20.3 and 20.5), and others	13.3 – 36.4%	15.0 – 30.0%

city of Moscow (11.4 and 13.6), Kostroma Oblast (17.3 and 12.6), Republic of Khakassia (17.4 and 11.9), Kurgan Oblast (15.5 and 8.8)	11.4 17.4%	–	Less than 15%
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Note. Data from Rosstat (2017). Calculations by the authors.

5. Discussion

An issue that warrants discussion is the number and line-up of coefficients required to be included in the investment forecasting model. In particular, Rosstat suggests using the following indicators characterizing investment activity by RF constituent entities: GRP per capita, relative share of people of working age in the total population, relative share of people with a higher education in the total pool of the employed, size of deposits held by natural persons in Russia's lending institutions per capita, relative share of profit-making organizations in the total pool of organizations, size of investment in fixed capital per capita, and index of the physical volume of investment in fixed capital as a percentage over the previous year.

What merits discussion is whether it is advisable to include in the investment forecasting model such indicators as GRP per capita and size of investment in fixed capital per capita. Note that, when it comes to implementing the above model within the forecasting system, the volume of investment and its share in GRP may be influenced by a tremendous number of factors, which it is not always possible to take account of quantitatively. Thus, for instance, one must not deny the effect of the art of diplomacy in relation to an increase of nearly 3.5 times in the relative share of foreign bank loans in total investment, from 1.8% to 6.2%. In this context, the more reserved statements by policy-makers may have facilitated the more vigorous growth. Further, it may also be worth knowing the size of investment in fixed capital associated with environmental protection and the rational use of natural resources. In 2016, the amount of money in environmental funds exceeded 29 million rubles, which constituted 20.8% of all money directed toward the rational use of natural resources. However, changes in policy in ecology, as a direct vector for the size of investment, will not allow you to quantitatively calculate a forecast for the dynamics of this kind of values. There is also a hypothesis about a correlation between investment activity in various countries and their national religions. However, there is a great deal of room for discrepancies when it comes to calculating things to substantiate such hypotheses. Due to the lack of a culture of investment among natural persons in the Russian Federation and paucity of research into the impact of this factor on the share of investment, the authors do not find it advisable to incorporate it into the forecasting model.

A question mark could also be put over the findings from a study by D. Ratzinger, K. Amess, A. Greenman, and S. Mosey, who somewhat downplay the significance of heads of a team who have a Humanities-based higher education or are graduates of arts-based universities in terms of the ability to attract investment (as opposed to individuals with a higher technical education) (Ratzinger *et al.*, 2017). There is

access to tools for providing a well-reasoned rationale for the efficiency of investment projects by graduates of institutions of higher general learning. The authors are convinced that the above scholars are employing an insufficiently relevant sample in their study.

6. Conclusion

Russia's low (8.4% in 2017) share of organizations engaged in technological, organizational, and marketing innovation, which has been on the decline since 2010, when the highest value for the period was recorded (10.4% in 2010), has given rise to serious concerns about investment activity in the country. The issue's relevance is determined by numerous factors of both an administrative and economic nature.

The authors' analysis of the volume of investment, its share in GRP, and the structure of investment based on types of economic activity, as well sources of funding, has helped to form a thorough idea of regional differences at the level of investment activity, classify Russia's regions based on rates of growth in investment, assess the degree of wear and tear on plant and equipment across RF constituent entities, identify the nation's regions with the highest and lowest rates of growth in investment activity, and assess some of the factors impeding investment activity. Below are some of the inferences the authors have arrived at.

The findings from some research preceding the authors' forecast based on their model indicate the extremely low immunity of Russian organizations to factors obstructing investment activity, as well as the geopolitical situation. The projected values obtained by the authors are optimistic in this respect but still confirm the general trend.

The study's findings, including the methodology for forecasting investment-based development, could be utilized in state regulation of trade activity. Regular monitoring of the level of investment activity in Russia's regions could help ensure the rational expenditure of taxpayer money factoring in structural transformations within the economy.

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