Authority Changes Constitution And Regions Answer: What Search Queries Show

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Abstract—Amendments to the Russian Constitution were proposed in January and adopted in July 2020. In this paper we study reactions of large Russian regions to these amendments using search queries to Internet as independent source of information. We compare Federal districts using separately negative and positive queries related both to amendedments and to authoritities in order to explain their joint dynamics. For the possibility of such a comparison, we indicated procedures of normalization and scaling. The proposed technology is supposed to be useful for those dealing with the analysis of moods in regions related to actions of the Central authority and causing opposite opinions of population.

I. Introduction

January 15, 2020, the Russian President Vladimir Putin in his message to the Russian Parliament proposed a number of amendments to the Constitution. March 10, one of the deputies of the Russian Parliament proposed either to abolish any restrictions on the number of presidential terms, or to allow the current President of Russia Vladimir Putin to be re-elected as a President (that is, to "reset" the number of terms he has already held in the Presidency). March 10 and 11, the Lower and Upper Chambers of the Parliament accepted amendments to the Constitution. July 1, a nationwide vote (referendum) was held and July 3, the President signed a decree "About the official publication of the Constitution of the Russian Federation with as amendments". The new Constitution entered into force July 4, 2020.

According to some political analysts, enabling Vladimir Putin to remain President after 2024 was the main goal of these amendments. And it was this amendment that drew fierce criticism both in media and on social networks. Under these circumstances, April 1, 2020, 3 months before the referendum, the administration of the Russian Presidential Academy of national economy and public administration (RANEPA) proposed to carry out study in order to assess the attitude of population to the proposed amendments to the Constitution. The requirement to research was the following: to use sources that are difficult to accuse in excessive subjectivity and bias. In other words, we could not use traditional sources of information in the form of public opinion polls, content of discussions in various forums, or papers in expert editions. That is why we have chosen the dynamics of queries to Internet search engines tied to the Federal Districts of Russia.

In this study, we consider the period from April 2019 to March 2020 (one full year) and the joint dynamics of population's attitude both to the amendments and to the authorities. This extension of the research object is related to the fact that the question about future elections and the future structure of power has become the object of numerous discussions since the Spring of 2019, a year after the election of the President of Russia. At the same time, these discussions were initiated by systemic and non-systemic opposition to the authorities. Just since the Spring of 2019 many politicians, economists, sociologists, and ordinary citizens have actively appeared in media and social networks.

In the presented study, we consider the following four questions:

- we form vocabulary of descriptors, which we use to analyze dynamics of queries to Yandex search service (section III)
- we build the dynamics of negative attitude to amendments to the Constitution and negative attitude to authorities in the districts of Russia in the period April 2019-March 2020 (section IV)
- we compare the districts of Russia with their negative and positive attitude to amendments to the Constitution in the period January-March 2020 (section V)
- we compare the districts of Russia with their negative and positive attitude to authorities in the period January-March 2020 (section V)

In addition to these tasks, we test hypothesis about the possible national factor in attitude to amendments to the Constitution and to authories in general (section VI).

The work was done in April 3-12, 2020 and it is reflected in the annual report of the department of system analysis and Informatics of the RANEPA.

II. Related work

Experience of using search queries to Internet in various applications has more than 10 years of its history. This experience is partially presented below (starting with the first publications).

Economic applications are reflected in the publications [1],[2],[3]. The first paper shows the relationships between behavior of financial markets and intensity of queries. The second paper assesses expectations of inflation using dynamics of quieries on example of India. In the last paper, queries are used to forecast unemployment rate in the Visegrad countries. The paper [4] studies how different segments of the US

population differ in their behavior in terms of search queries. The paper [5] uses dynamics of queries to forecast birth rate in Russia. The papers [6],[7] predict seasonal influenza epidemics in the United States and South China, respectively. The paper [8] desribes possibilities to forecast of economic crimes in Russia using search quieries. In the paper [9], search queries together with materials of the General Prosecutor's Office are used to analyze activities of regional police and to predict some types of crimes in the regions.

To date, we do not know available publications in English, where dynamics of queries to Internet search services is used as a tool for analyzing attitude of population to actions of authorities in a country or in its regions. We can mention here the paper in Russian [10], which considered dependence of the intensity of positive and negative queries on the volume of retail trade in the Federal districts of Russia. To a certain extent this dependence reflects an attitude of population towards the authorities responsible for the welfare of the district. The technique of constructing vocabularies for analyzing dynamics of search queries is described in detail in [11]. In all the applications from the list above the Russian search query service Yandex [12] and the popular International service Google [13],[14] were used.

In this paper, we do not consider the question of information confrontation in media and social networks that were mentioned above. Our object of research is queries to Internet search engines as an independent source of information. Now we can only note a few interesting reseach of recent years, where information confrontation in media is studied using differential models [15],[16].

III. LINGUISTIC RESOURCES

A. Descriptors for the topic 'Amendments to the Constitution'

We selected descriptors that reflect a negative attitude towards changes in the Constitution. We left only one descriptor from this list: 'violation of the Constitution', which correlates well with the other negatively colored ones, as 'violation of freedom' (r=0.79), 'zeroing' (r=0.65), etc.

We selected descriptors that reflect a positive attitude towards changes in the Constitution. Here we also left only one descriptor: 'necessary changes in the Constitution', which correlates well with the other positively colored ones, as 'Putin saved Russia' (r=0.57), 'hidden support' (r=0.55), etc.

B. Vocabulary for the topic 'Authorities'

In our study, we consider attitude to amendments to the Constitution in the mirror of population's attitude to authorities. Therefore, we have prepared a vocabulary for the topic 'Authoriries'.

Descriptors reflecting positive and negative emotions in combination with the words 'authorities', 'Putin' (President of Russia), 'Mishustin' (Prime Minister), 'Sobyanin' (Mayor of Moscow), 'Russia' were included in this vocabulary.

Examples of emotionally positive descriptors are: 'authorities are correct', 'Sobyanin is correct', 'Mishustin is correct', 'Russia is correct', 'the authorities are good', 'the authorities are wise', 'the authorities work', 'the authorities are adequate', 'the authorities are great' , 'the authorities took action', etc.

Examples of emotionally negative descriptors are: 'the authorities [profanity]', 'the authorities are indifferent', 'the authorities mock', 'the authorities are freaks', 'the authorities are malicious', etc.

The vocabulary of negative descriptors includes also words and phrases that offend citizens who support the country leaders and that reflect negative situation in the contry economy.

Examples of such negative descriptors are: 'quilted jacket', 'putinoid', 'fall of the ruble', 'collapse of oil prices', 'reduction of wages', 'shortage', 'no medicine', 'no masks', 'no toilet paper', 'they secretly introduce Federal police', 'impoverishment', 'corruption', etc.

In total, we revealed 306 descriptors, 211 were the negative ones

IV. DYNAMIC OF TONALITY OF QUERIES IN THE FEDERAL DISCTRICTS OF RUSSIA IN THE PERIOD APRIL 2019 – MARCH 2020

A. Dynamics of queries

The dynamics of a negative attitude towards the topic 'Authority' and a negative attitude towards the topic 'Amendments to the Constitution' are considered together. The purpose of such a joint presentation is to find a direct connection between them and to identify joint peaks.

Each figure in this section contains 2 charts with their own scales: the left part of the legend reflects the negative to the topic of authorities and the right part of the legend reflects the negative to the topic of amendments to the Consitution.
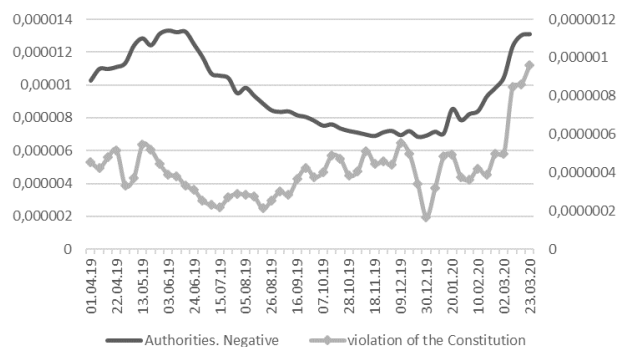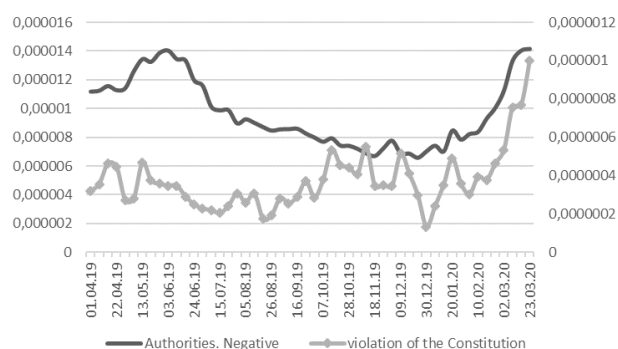

Fig.1. The negative to both topics, Russia
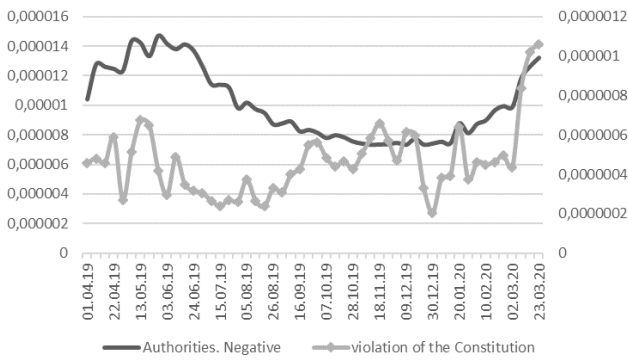

Fig.2. The negative to both topics, Center

Fig.3. The negative to both topics, Volga

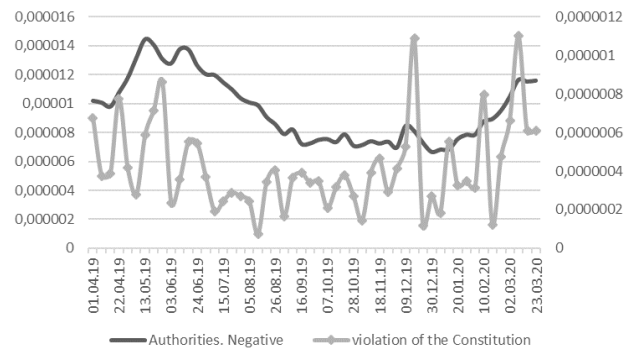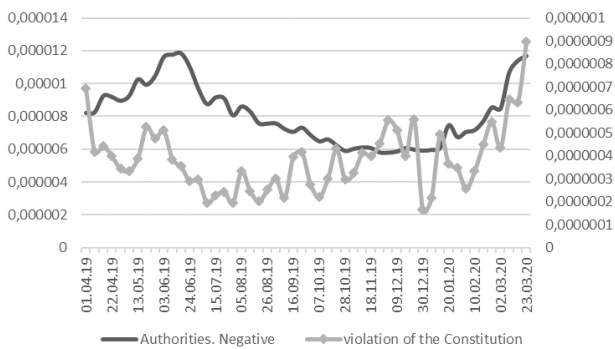Fig.4. The negative to both topics, North-West

Fig.5. The negative to both topics, Far East

Fig.6. The negative to both topics, Siberia
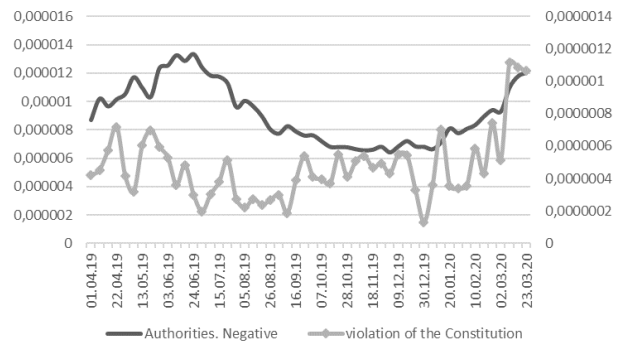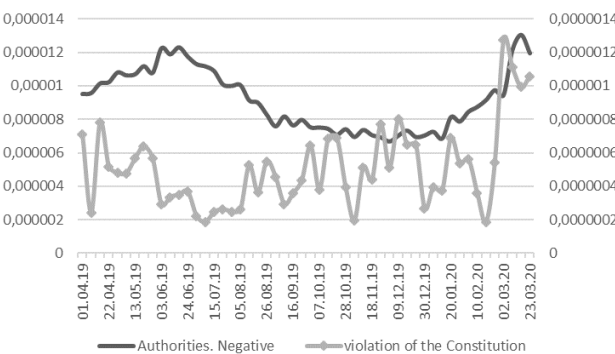
Fig.7. The negative to both topics, North Caucasus

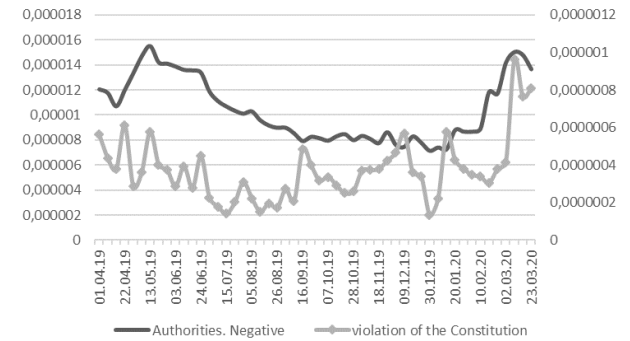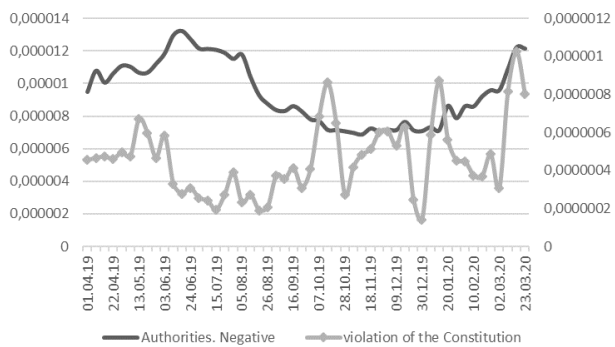Fig.8. The negative to both topics, Ural
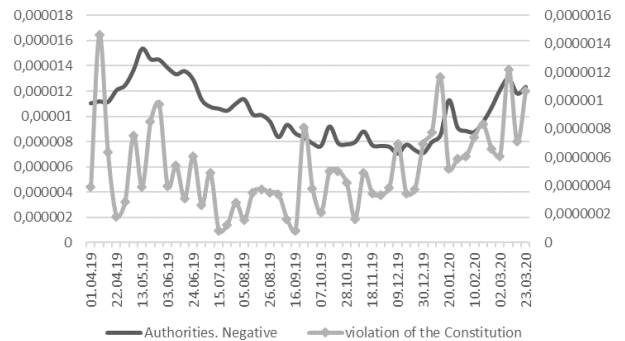
Fig.9. The negative to both topics, South

Fig.10. The negative to both topics, Crimea

B. Analysis of dynamics of queries

In all the districts, the level of the negative to the topic of authority is an order higher than the level of the negative to the topic of amendments to the Constitution. It is naturally, since the topic of amendments is essentially narrower and only one key descriptor is taken to express an attitude to the amendments.

Announcement in January 2020 about future possible constitutional amendments passed almost imperceptibly on graphs of the negative to the topic of authority. The most significant peak at this point occurred in the Republic of Crimea, which reflects the special intolerance of some part of the local population towards this event.

In all the districts one can see:

- rise of the negative attitude to the topic of authority by the middle and the end of March 2020
- at the same time, there is also a negative attitude towards the amendments to the Constitution

Perhaps the negative to the topic of authority is associated with a sharp deterioration in economic position of working population due to non-working days and, in the future, quarantine. These actions of the authorities are criticized by part of the population from the point of view of amendments to the Constitution, when these actions are associated with authoritarianism of the authorities.

However, in some Federal districts the peak of the negative to amendments to the Constitution is not the maximum one on all the period of time but only one of the several ones. For example, dwellers of Crimea very often react negatively to very different events. It is interesting to note a large increase of the negative in April 2019 together with the fact that April 11, 2019 is the Constitution Day of the Republic of Crimea.

Comparable peaks of the negativity to amendments to the Constitution are observed in the North Caucasus in December 2019 and March 2020..

There is a large increase of the negative in Siberia in October 2019. Perhaps it is a new surge in the topic of selling Siberian forests to China.

V. COMPARISON OF THE FEDERAL DISCTRICTS OF RUSSIA IN THE PERIOD JANUARY-MARCH 2020

A. Preprocessing

The Federal districts are compared in their relationship to amendments to the Constitution. Negative and positive attitudes are considered separately. To perform the comparison, it is necessary to carry out preprocessing, which consists in normalization on:

- the number of population in a district;
- the degree of internetization of district's population;
- the total number of queries in database at each moment of time.

Then the average level of the negative and the positive to the topic of amendments to the Constitution in each Federal

District are calculated. Finally, these data are scaled on summarized level of the negative and the positive for all the districts. Crimea is considered separately from the Southern Federal district, to which it belongs

B. Negative attitude towards amendments to the Constitution and interpretation of the results

In Fig.11 we show the normalized level of the negative to the topic of amendments to the Constitutions in [%] in the Federal districts of Russia and in Crimea. The total negative level is taken as 100%. The difference (with respect to the average) is relatively small and equal to 6%.
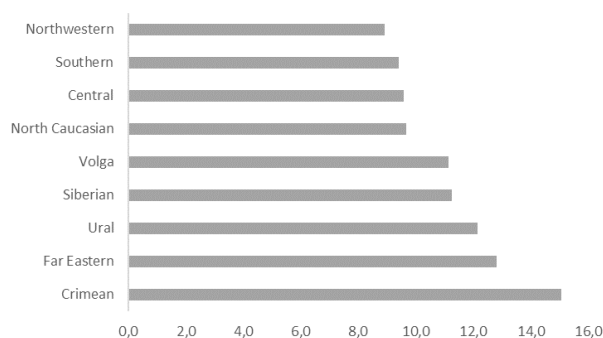

Fig.11. Contribution of districts to the total negative attitude to the topic of amendments to the Constitution

One can see the following:

- The minimum level of the negative towards amendments is observed at the North-West, South and Center
- A high level of the negative towards the amendments manifests itself at the Far East that does not correspond to the maximum positive attitude towards the authorities (see p.E below). A change of authority structures took place in the regions of this Federal dstrict in Autumn of 2020. And here, perhaps, a different attitude towards the regional and Federal authorities is manifested
- The maximum level of dissatisfaction towards the amendments in Crimea can be explained by the presence there of a significant number of dwellers of Ukrainian nationality and Crimean tatars. Among them, there is a significant number of persons dissatisfied with the new status of the peninsula

C. Positive attitude towards amendments to the Constitution and interpretation of the results

In Fig.12 we show the normalized level of the positive to the topic of amendments to the Constitutions in [%] in the Federal districts of Russia and in Crimea. The total positive level is taken as 100%. The difference (with respect to the average) is relatively large and equal to 20%.

One can see the following:

- The minimum level of the positive to the amendments in Crimea is a natural reflection of the maximum level of dissatisfaction towards the amendments (see p.B above)

- It seems strange the low level of the positive to the amendments at the North Caucasus, where the government's initiatives are traditionally supported
- The Southern district has the maximum positive attitude towards the amendments, although it also has the maximum negative attitude towards the authorities (see p.D below). Here the situation is similar to that observed at the Far East, namely a different attitude towards the regional and Federal authorities
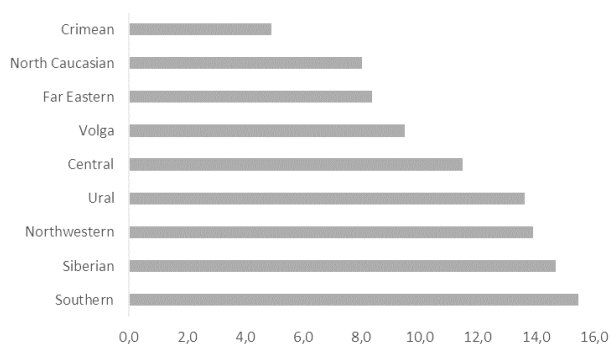

Fig.12. Contribution of districts to the total positive attitude to the topic of amendments to the Constitution

D. Negative attitude towards authorities and interpretation of the results

In Fig.13 we show the normalized level of the negative to the topic of authorities in [%] in the Federal districts of Russia and in Crimea. The total negative level is taken as 100%. The difference (with respect to the average) is large and equal to 28%.
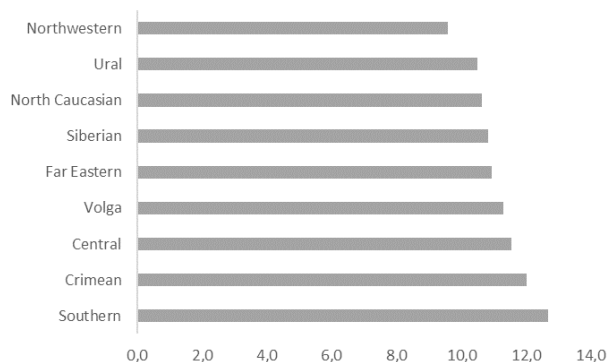

Fig.13. Contribution of districts to the total negative attitude to the topic of authorities

One can see the following:

- The minimum level of the negative towards the authorities at the North-West can be explained by the increased attention of the Russian authorities to St. Petersburg as the largest city in the district and "the second capital" of Russia
- The maximum level of dissatisfaction towards authorities in Crimea is quite correlated with the maximum level of dissatisfaction towards amendments to the Constitution (see p.B above). This circumstance can be explained by the presence there

of a significant number of dwellers of Ukrainian nationality and Crimean tatars Among them, there is a significant number of persons dissatisfied with the new authorities of the peninsula

- The maximum level of the negative in the Southern district can be explained by poor administration at the Stavropol region and Krasnodar region, which was repeatedly reported by the media

E. Positive attitude towards authorities and interpretation of the results

In Fig.14 we show the normalized level of the positive to the topic of authorities in [%] in the Federal districts of Russia and in Crimea. The total positive level is taken as 100%. The difference (with respect to the average) is relatively large and equal to 16%.
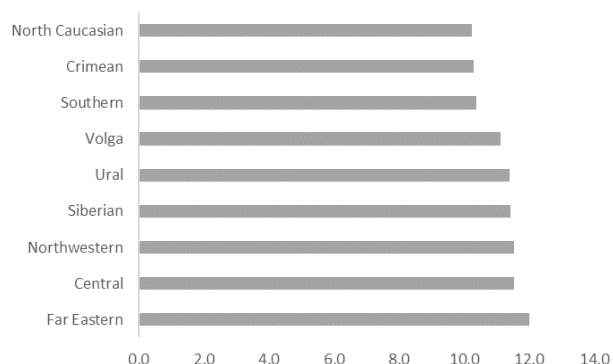

Fig.14. Contribution of districts to the total positive attitude to the topic of authorities

One can see the following:

- It seems strange the minimum level of the positive towards authorities at the North Caucasus, where population traditionally support both the regional and Federal authorities
- The low level of the positive towards the authorities in Crimea and the Southern district is a reflection of a large negative attitude towards their authorities (see p.D above)
- The maximum level of positive attitude towards authorities is observed at the Far East. In this Federal district a change of power structures in the regions took place in Autumn, and the new government already had significant achievements

VI. ABOUT ONE HYPOTHESIS

The high level of the negative and the low level of the positive in relation to amendments to the Constitution in Crimea made us put forward an assumption about the relation of these characteristics with share of the Ukrainian population in the Russian districts. Indeed, there are 15% of ukrainians in Crimea that more than in other districts of Russia. We extended our research and tested this supposition not only in relation to amendments to the Constitution, but also in relation to authority in general. The null hypothesis in each case consists in that there is no a significant statistical relationship between the indicators under consideration. The initial information is

presented in Table 1. It shows the normalized values of share of the Ukrainian population in the districts of Russia and Crimea in [%], as well as the contribution of the districts to the negative and the positive with respect to amendments to the Constitution and to authoriries in [%].

It is easy to see that at the 5% significance level:

- there is a reason to believe that there is a relationship between attitude to amendments to the Constitution and share of the Ukrainian population
- the available data say about absence of a significant relationship between attitudes towards authorities and the share of Ukrainians

TABLE I. SOURCE DATA FOR CALCULATIONS AND RESULTS OF TESTING HYPOTHESES, [%]

N.	District	Ukra-nians	Negative/Positive to amendments	Negative/Positive to authoriy
1.	Center	1.2	9.6 / 11.5	11.6 / 11.6
2.	North West	2.3	8.9 / 13.9	9.6 / 11.6
3.	South	1.3	9.4 / 15.5	12.7 / 10.4
4.	N. Caucasus	0.6	9.7 / 8.0	10.6 / 10.3
5.	Volga	0.9	11.1 / 9.5	11.3 / 11.1
6.	Ural	4.0	12.1 / 13.6	10.5 / 11/4
7.	Siberia	1.1	11.2 / 14.7	10.8 / 11.4
8.	Far East	3.4	12.8 / 8.4	10.9 / 12.0
9.	Crimea	15.1	15.1 / 4.9	12.0 / 10.3
.	*p-value*		**0.6 / 8.4**	48.4 / 37.9

VII. CONCLUSION

This pilot study shows the ability of search queries to correctly reflect attitude of population towards the actions of authorities. Our results were supported by experts of RANEPA.

The proposed technology can be a useful tool for political scientists, economists, and sociologists, when: (a) necessary information is absent or essentially distorted, and (b) information appears with a deliberate or unintentional delay.

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