

Social capital as a containment factor of the COVID-19 pandemic

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Abstract

Effectiveness of the pandemic containment can depend upon both actions of governments and willingness of the population to follow the introduced rules, which is heavily dependable upon the social capital structure in society. This article analyzes relationship between various components of social capital and changes in mobility during the COVID-19 pandemic. The article is based on data from the World Values Survey, Google COVID-19 Community Mobility Reports, Oxford COVID-19 Government Response Tracker, etc. The study hypotheses have been empirically tested on a sample of 61 countries, as well as subsamples of countries with high- and low-quality institutions. The results show that high levels of trust in the government, police and courts, as well as developed norms of cooperation in society (in particular, dislike of free riding), other things being equal, contribute to lower mobility during the pandemic. This effect is particularly pronounced in countries with high-quality institutions. A high level of generalized trust, on the contrary, is not associated with a lower mobility during the pandemic, which may limit its containment, especially in countries with low-quality institutions. The results obtained can be used for developing socio-economic policy aimed at containing the pandemic.

Keywords

trust, mobility, norms of cooperation, social capital, COVID-19

JEL codes: I12, I12, I18, Z13, Z13

Introduction

In 2020, the coronavirus pandemic and its associated socio-economic consequences – increased mortality, higher healthcare burden, slowdown in economic activity, bankruptcy of companies, and reduced household income – have become a serious challenge for the

whole world. Governments of many countries were forced to decide how to ensure control over the COVID-19 spread. During the first months of the pandemic, when there were neither vaccines nor understanding of how to effectively treat coronavirus infection, introduction of self-isolation and social distancing measures were the main tool to contain the spread of the pandemic. When vaccines became available, vaccination was added as a containment measure. Despite the fact that these measures bring social benefits (reduced COVID-19 incidence and mortality among vulnerable groups, decreased burden on healthcare system, etc.), in the minds of people they may be associated with individual costs (restricted mobility, changes in usual mode of life, possible post-vaccination distress, etc.).

This suggests a relationship between social capital – which refers within the framework of this study to the norms of trust and cooperation widespread in society, contributing to overcome the free rider problem – and response of the population to the measures introduced by the state to control the pandemic. Identification of this relationship may be important to increase effectiveness of the fight against the coronavirus with due regard to characteristics of social capital of certain country/region /socio-demographic group.

At the moment, the issue on the relationship between social capital and effectiveness of the COVID-19 containment remains understudied. First, the existing empirical studies often rely on data from a single country (Brzezinski et al. 2020; Barrios et al. 2020; Bai et al. 2020; Ding et al. 2020, Brodeur et al. 2021; Murphy et al. 2022). Second, research is generally focused on relationship between various components of social capital (in particular, generalized trust) and effectiveness of containment measures (Borgonovi and Andrieu 2020; Doganoglu and Ozdenoren 2020, Mazive et al. 2021). Third, currently, there are few studies on the analysis of flexibility of the identified relationship for different groups of countries (Romano et al. 2021). Due to specifics of transfer mechanisms, one can expect differences in the nature of relationship between various components of social capital (for example, generalized and institutional trust) and effectiveness of the pandemic containment in countries with different quality of institutions.

The purpose of the study is to analyze relationship between various components of social capital and indicators of the pandemic containment based on a cross-country sample. Identification of such relations (especially separately for countries with high and low-quality institutions) can be used in designing socio-economic measures aimed at combatting the pandemic.

The first section of the article provides an overview of the analysis of relationship between social capital and containment measures in different countries. The second section describes mechanisms of relationship between various components of social capital and indicators of containment measures. The third and fourth sections outline the study data and methodology. The fifth section describes results of hypothesis testing. The sixth section discusses results and possible directions for further research. The final section formulates the study key conclusions.

1. Social capital and pandemic containment: the problem of measurement

To analyze the relationship between social capital and effectiveness of pandemic containment, it is important to operationalize each of these concepts.

Social capital

Despite a plenty of research on social capital, there is a variety of approaches to its definition in the literature (see, for example, Adler, Kwon 2002). In this article, social capital is understood as norms of trust and cooperation to solve the free rider problem. This definition is based on the approach of L. Guiso, P. Sapienza, L. Zingales (Guiso et al. 2011: 419) and allows, on the one hand, to take into account criticism on the part of R. Solow (1995) and define social capital as a capital, and on the other hand, use the metrics of social capital widely used in empirical research (indicators of generalized and institutional trust and norms of cooperation (Knack, Keefer 1997)).

To characterize generalized and institutional trust, blocks of questions in large sociological studies (for example, the World Values Survey) are usually used to determine the level of trust in general, as well as the level of trust in individual institutions (for example, the government, court, etc.).

In modern empirical research, there is no consensus on the preferred metrics for measuring norms of cooperation. Among the statistical indicators used are turnout for the elections, levels of blood donation in the country, etc. (Buonanno et al. 2009; Durante et al. 2021). Among the sociological indicators are questions on assessing the level of dislike of free riding in society (unwillingness to participate in production of public goods, a tendency towards receiving individual benefits to the detriment of public ones). S. Knack and F. Keefer (Knack, Keefer 1997) suggested using questions from the World Values Survey as such indicators, characterizing how much a person can justify the following types of behavior:

1. Claiming government benefits to which you are not entitled;
2. Avoiding a fare on public transport;
3. Cheating on taxes;
4. Keeping money, that you have found;
5. Failing to report damage you've done accidentally to a parked vehicle.

With due regard to differences in the quality of statistics, the use of sociological data collected in line with a single methodology to analyze relationship between the norms of cooperation and indicators of the pandemic containment at the intercountry level seems the most advanced approach. Among the indicators proposed by S. Knack and F. Keefer and present in the latest wave of the World Values Survey for 2017-2020 (the first three indicators), indicator 2 – «Avoiding a fare on public transport» is most relevant to study inclination of people to comply with the introduced measures aimed at curbing the pandemic.

Avoiding a fare on public transport (as well as violation of self-isolation measures) is associated with obtaining individual benefits at the expense of society. At the same time, it does not involve a close interaction with state authorities and is not associated with deliberate deception of state authorities that requires additional actions (preparation and signing of documents, etc.). Payment for public transport (as well as compliance with self-isolation measures) is a combination of formal and informal institution – a specialized guarantor, as well as any member of society can act as a guarantor of these rules. Altogether, it allows to consider dislike of free riding as an indicator of the norms of cooperation relevant to the purpose of the study.

Containing the pandemic

The most obvious indicators reflecting effectiveness of the pandemic containment in the country could be COVID-associated morbidity and mortality rates. However, due to differences in statistical registration (including differences in specifying causes of deaths) and

equipment with COVID-19 testing systems among the population, the use of these indicators in the intercountry (and sometimes even interregional) analysis leads to distortions.

As a result, indicator of changes in mobility (as a characteristic reflecting the degree of compliance with self-isolation measures) is often used as an alternative indicator of the pandemic containment in the first months of its spread (less prone to distortion) (Allcott et al. 2020; Andersen 2020; Deopa and Fortunato 2020; Durante et al. 2021; Painter, Qiu 2020).

Studies (Courtemanche et al. 2020, Prem et al. 2020) show that changes in mobility reduces the growth rate of confirmed cases of COVID-19. Accordingly, decreased mobility can be considered as a proxy variable reflecting effectiveness of measures to contain the pandemic in its first months (when there were no vaccines and limiting mobility was the key state measure to control spread of the pandemic).

Relationship between social capital and pandemic containment

Currently, there are several studies on the relationship between social capital and effectiveness of the pandemic containment (including reduced mobility) both at the regional and intercountry level (see Table 1).

Table 1. Relationship between components of social capital and mobility during the pandemic

Components of social capital	Mobility	
	Negative relationship	Positive relationship
Generalized trust	<ul style="list-style-type: none"> • Based on the U.S. data, trust in people in general (Brodeur et al. 2021). 	<ul style="list-style-type: none"> • Based on the Switzerland data, trust in people in general (Deopa, Fortunato 2020). • Based on data from 73 countries, trust in people in general (Doganoglu, Ozdenoren 2020). • Based on data from 18 African countries, trust in people in general (Mazive et al. 2021).
Institutional trust	<ul style="list-style-type: none"> • Based on the U.S. data, trust in state institutions, mass media, medicine, science (Brodeur et al. 2021). • Based on data from 25 countries, trust in the parliament, political parties, police, courts (Oksanen et al. 2020). • Based on data from 18 African countries, trust in the president, parliament, police and local authorities (Mazive et al. 2021). • Based on the Australian data, trust in the government (Murphy et al. 2022). 	
Norms of cooperation	<ul style="list-style-type: none"> • Based on the Italian data, election turnout (Durante et al. 2021). • Based on the U.S. data, election turnout (Barrios et al. 2020; Bai et al. 2020; Ding et al. 2020). 	

As Table 1 shows, studies have found a negative relationship between mobility and indicators of institutional trust in different samples, as well as a negative relationship with the norms of cooperation (measured through election turnout) at the level of individual countries. However, for the generalized trust indicator, the conclusions are contradictory and dependable upon sampling, while there are no data on the role of cooperation norms in containing the pandemic for cross-country samples.

Lack of a comprehensive picture of how various components of social capital are related to the indicators of the pandemic containment, as well as an understanding to what degrees these conclusions are universal for different countries, makes it difficult to develop recommendations with due regard to specifics of social capital in the fight against the pandemic.

2. Mechanisms of the impact of social capital on the COVID-19 spread containment: hypotheses

Results obtained in research suggest the existence of various transfer mechanisms for various components of social capital – generalized trust, institutional trust, norms of cooperation:

- **Generalized trust.** In countries where trust in other people is high, individuals are less likely to expect opportunistic behavior from others and, accordingly, are more likely to believe that others conscientiously observe quarantine in case of the disease symptoms. This allows them to reduce their mobility to a lesser extent due to fears of infection (Deopa, Fortunato 2020; Doganoglu, Ozdenoren 2020).
- **Institutional trust** (trust in the government, police, courts). In countries with high levels of trust in the government, people are more willing to comply with recommendations of the state authorities and, as a result, there is a greater decrease in mobility during the period of restrictions. In such countries, the introduced measures are more perceived as useful for the individual and society in general, rather than measures restricting personal freedom. A similar effect can be expected in countries with high trust in the guarantors of the state measures implementation – the police and courts. It increases confidence in punishment in case of violation of the imposed rules (Brodeur et al. 2021, Murphy et al. 2022).
- **Norms of cooperation** (dislike of free riding). In countries where people do not justify free riding, one can expect higher rates of compliance with socially accepted norms and, in particular, a greater decrease in mobility during the pandemic. In communities with well-developed norms of cooperation, people are more inclined to sacrifice their own interests (for example, visiting public places, freedom of movement) in order to achieve the public good (containment of the pandemic) (Barrios et al. 2020, Durante et al. 2021).

Based on the considered mechanisms, the following hypotheses have been made to be tested in the framework of the empirical study:

Hypothesis 1. The higher the indicators of generalized trust in society, the less mobility decreases during the COVID-19 period, all other things being equal.

Hypothesis 2. The higher the indicators of institutional trust in society, the more mobility decreases during the COVID-19 period, all other things being equal.

Hypothesis 3. The higher the rates of free riding dislike in society, the more mobility decreases during the COVID-19 period, all other things being equal.

In addition, it can be expected that the nature of relationship between various components of social capital and changes in mobility will differ across countries depending on the

quality of institutions. In particular, it can be assumed that, since high quality of formal institutions (rule of law, control over corruption, etc.) implies universality of law enforcement for all groups of the population, the relationship between institutional trust and changes in mobility will be more pronounced in countries with high quality of formal institutions. Willingness to comply with the state-imposed measures to contain the pandemic will be further reinforced by expectations of fair punishment in case of violation. Similarly, it can be expected that in countries with higher-quality institutions, the relationship between dislike of free riding and decreased mobility will be more pronounced as well.

3. Data

Indicators of social capital

To measure various components of *social capital* in different countries, this study uses data of the seventh wave of the World Values Survey (hereinafter referred to as WVS).

To test the hypotheses described in section 2, the following indicators have been used:

- **generalized trust**, measured as share of the respondents who agree with the first part of the question “Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?”;
- **institutional trust** (trust in the government, courts, police), measured as share of the respondents who, when answering the question “How much confidence you have in the following organizations/public institutions.....: is it a great deal of confidence, quite a lot of confidence, not very much confidence or none at all?” chose any option, except for “none at all”;
- **norms of cooperation** (dislike of free riding), measured through share of the respondents who, when answering the question “Whether you think avoiding a fare on public transport can always be justified, never or something in between?” on a scale from 1 “Never justifiable” to 10 “Always justifiable”, chose the option “never justifiable”.

Indicators of changes in mobility

To measure changes in *mobility*, daily data from Google Community Mobility Reports (COVID-19: Community... 2021) are used, which show changes in frequency of visits to individual public places and duration of stay in residential areas (as a percentage) compared to the baseline for a certain day of the week. The baseline is considered to be a regular value for the corresponding day of the week. The median mobility value for each day of the week, calculated for the period from January 3 to February 6, 2020 is used as the baseline value. Statistics for Reports are collected on the basis of depersonalized aggregate data received from authorized users with enabled geolocation. Data are available for six categories of places:

- 1) retail and recreation;
- 2) grocery and pharmacy;
- 3) parks, public gardens, dog parks;
- 4) transit stations;
- 5) workplaces;
- 6) residential areas.

Control variables

The following two categories of indicators are used as control variables, reflecting:

- 1) phase of the pandemic and its specifics (stringency index; number of new cases of infection);
- 2) socio-economic characteristics of the country (per capita GDP; population density).

Data on the pandemic phase (the periods before and after the first case of infection was registered in the country) based on Johns Hopkins University data (Johns Hopkins... 2021), allow to take into account discrepancy in the pandemic onset timing in different countries. The stringency index data available from the Oxford COVID-19 Government Response Tracker website (OxCGRT 2021) provide for monitoring severity of the state-induced measures to contain the pandemic. The index is daily rescaled to a value from 0 to 100 and aggregates the following indicators: workplace closure, closure of schools, bans on mass events, bans on meetings/gatherings, public transport closure, regulations on self-isolation, bans on mobility, closure of borders. Using a smoothed number of daily new confirmed COVID-19 cases as an additional control variable – (7-day rolling average number of new confirmed cases based on the Yandex DataLens service data (Coronavirus: Dashboard 2021)) – makes it possible to estimate intensity of the pandemic phase.

Additionally, socio-economic indicators are used as control variables according to the World Bank (The World Bank 2021): per capita gross domestic product (GDP) (as an indicator of economic development) and population density (as a factor that can influence the COVID-19 spread rate). The study list of control variables corresponds to those commonly used in similar studies (Borgonovi and Andrieu 2020; Deopa and Fortunato 2020; Ding et al. 2020; Durante et al. 2021).

To validate sustainability of conclusions, the hypotheses have been additionally tested on subsamples of countries with high and low-quality institutions, assessed through the control of corruption indicator in the country, according to the World Government Indicators for 2020 (WGI 2021). This indicator, on the one hand, correlates with other indicators of quality of institutions (rule of law, protection of property rights, etc.), and on the other hand, reflects the possibility of “cheating on” the existing rules in society, which best meets the problems of the study. To divide countries into subsamples according to quality of institutions, data on the country’s rating among all countries by this indicator were used (0 is the lowest ranking, 100 is the highest ranking). Countries with a corruption control rank below 70 were included in the subsample of countries with low-quality institutions, 70 and above – in the subsample of countries with high-quality institutions (for more information, please, refer to Annex 1).

Table 2 outlines information about variables and data sources used in the study in more detail, while Annex 2 presents descriptive statistics.

The final data sample to analyze the relationship between social capital and mobility includes 61 countries. The period under study – 19.02.20 – 22.04.20. Selection of the period is due to the fact that the dates under consideration reflect the first months of the pandemic in each country under study, include the period before the first case of infection was registered and the period of the state-induced measures, affecting mobility. The average time interval after registration of the first case of infection in the country (the period during which the dummy variable of the pandemic phase equals to 1) equaled to 47 days (the median value is 53 days) in the study sample of countries.

Table 2. Description of variables

Explanatory variables	
Changes in mobility, % (COVID-19: Community... 2021) Calculated for six categories of places: 1) retail and recreation; 2) grocery and pharmacy; 3) parks, public gardens, dog parks; 4) transit stations; 5) workplaces; 6) residential areas.	For categories 1-5, the indicator shows changes in the number of visits to relevant place; for category 6 the indicator shows changes in the length of stay at places of residence, %.
Variables of interest	
Generalized trust (WVS 2021)	Share of the respondents who agree that most people can be trusted.
Trust in the government (WVS 2021)	Share of the respondents who have some trust in relevant institutions (all respondents except for those who have none confidence in relevant institutions).
Trust in the courts (WVS 2021)	
Trust in the police (WVS 2021)	
Dislike of free riding (WVS 2021)	Share of the respondents who believe that avoiding a fee on public transport can never be justified.
Control variables	
Stringency index (OxCGRT 2021)	Intergal indicator reflecting strictness of government measures in different countries aimed at the pandemic containment that provides for measuring direct impact of such measures on mobility in the country.
Smoothed daily new confirmed COVID-19 cases (Coronavirus: Dashbord 2021)	“Reflects a 7-day rolling average number of new confirmed COVID-19 cases and provides for measuring impact of epidemiological situation on changes in mobility.
Per capita GDP, USD (The World Bank 2021)	Reflects the country’s economic development which potentially can affect changes in mobility.
Population density, people per square km. (The World Bank 2021)	Provides for monitoring possibility to observe social distancing and can affect changes in mobility
Pandemic phase (Coronavirus: Dashbord 2021)	0 – before the first case of infection was registered in the country, 1 – after the first case of infection was registered in the country.
Corruption control (WGI 2021)	Indicates the degree the state power is used for personal benefits including both mild and severe corruption as well as «power takeover» by the elites and private interests. The higher the indicator (ranges between 0 and 100%) the higher the level of control of corruption in the country and quality of institutions.

4. Research methodology

The data used in the study have a panel structure and combine indicators that change daily (for example, changes in mobility) and those that remained unchanged under the study period (for example, per capita GDP, indicators of social capital, etc.). To account for the impact of variables that remain unchanged over time, the indicator of the pandemic phase is included in the model by multiplying on time-invariable variables of interest and control variables. A similar approach was used in the models of R. Durante et al., as well as N. Deopa and P. Fortunato for testing the nature of influence of various cultural characteristics on changes in mobility during the pandemic in Switzerland and Italy (Deopa, Fortunato 2020; Durante et al. 2021).

Below is the model adapted for the purposes of the country sampling that has been estimated in this study:

$$\begin{aligned} \text{ChM}_{it} = & \beta_1 \cdot \text{SC}_i \cdot \text{Phase}_{i,t} + \beta_2 \cdot \text{Stringency}_{i,t} + \beta_3 \cdot \text{Infection cases}_{i,t} + \\ & + \beta_4 \cdot \text{GDP}_i \cdot \text{Phase}_{i,t} + \beta_5 \cdot \text{Density}_i \cdot \text{Phase}_{i,t} + c_i + d_t + \varepsilon_{i,t}, \end{aligned} \quad (1),$$

ChM_{it} – change in frequency of visits or length of stay of residents of country i on a day t in a certain type of public places compared to the baseline for the corresponding t day of the week.

SC_i – indicators of social capital in country i .

$\text{Phase}_{i,t}$ is a phase of the pandemic, which takes the value 0 before the first case of COVID-19 was registered in country i , 1 – after the first case was registered.

$\text{Stringency}_{i,t}$ is the stringency index of measures taken by the government of country i to contain the pandemic on day t .

$\text{Infection cases}_{i,t}$ is the smoothed number of daily new confirmed COVID-19 cases in country i on day t (New COVID-19 cases).

GDP_i – per capita GDP in country i .

Density_i – population density in country i .

c_i – fixed country effects.

d_t – fixed date effects.

Evaluation of the model parameters was carried out though intra-group transformation using consistent standard errors under clustering.

5. Empirical analysis results

The empirical testing of the hypothesis have generally confirmed the assumptions about nature of the relationship between various components of social capital and changes in mobility.

Econometric testing of Hypothesis 1 (on *significance of generalized trust*) for various categories of public places with other factors under control, showed a weak positive relationship between generalized trust and mobility in retail and recreation, in parks, public gardens, dog parks and transit stations, as well as a negative relationship with the length of stay in residential areas (Table 3). In other words, a higher generalized trust, all other things being equal, is not associated with decreased mobility (which corresponds to the transfer mechanism described in section 2), furthermore, the result is sustainable if Scandinavian countries that have traditionally demonstrated a high level of generalized trust are excluded from the sample.

Testing results of Hypothesis 2 (on *significance of institutional trust*) show that higher institutional trust (the government, courts, police), other things being equal, is associated with decreased number of people in public places (grocery and pharmacy; parks, public gardens, dog parks), in workplaces, as well as with increased length of stay in residential areas (see Table 4). This can serve as a proof of the mechanisms described in section 2: trust in state authorities and guarantors of the imposed restrictions (court; police) increases willingness of the population to follow the state recommendations on containing the pandemic.

Hypothesis 3 (on *significance of dislike of free riding*) has been confirmed as well. All other things being equal, the higher the share of people who dislike avoiding a fare on public transport in the country, the lower the number of visits to grocery and pharmacy and the longer the length of stay in residential areas (see Table 4). The result obtained corresponds to the described transfer mechanisms. Reducing mobility to contain the spread of the pandemic is a collective action. Violation of measures aimed at restricting mobility by a person may be perceived as receiving “individual benefit” (the ability not to restrict their freedom of movement), but at the same time involves social costs: higher risk of infection spread and, accordingly, the higher burden on healthcare system.

Similar relations have been calculated for alternative metrics of norms of civic cooperation proposed by S. Knack and F. Keefer (Knack, Keefer 1997) – an indicator of willingness to justify a person claiming government benefits to which they are not entitled). However, most of the relations were insignificant both in the subsample of countries with high-quality and low-quality institutions. This may serve as an additional proof that dislike of free riding (in a broader sense) is associated with willingness to incur individual costs in order to contain the pandemic (whether through reduced mobility or vaccination).

According to the model logics, an important (and statistically significant) control variable explaining mobility in the country is stringency of the imposed restrictions (Stringency index). The stricter the disease control measures in the country, the higher the decrease in the number of visits to public places and the longer the length of stay in residential areas. Research results show that the Stringency variable is key to explaining changes in mobility (see Doganoglu, Ozdenoren 2020; Mazive et al. 2021). However, significance of coefficients for various components of social capital controlling for Stringency index makes it possible to identify an independent (though small) effect of social capital on the pandemic containment (please, refer to Annex 3 for results of model with control variables, but without variables of interest). Statistical significance of other control variables varies across models. At the same time, exclusion of insignificant control variables, usually used for such models, hardly changed conclusions about the relationship under study.

Table 5 shows systematized results of regressions across various components of social capital and changes in mobility individually in subsamples of countries with high-quality and low-quality institutions. For ease of perception, the table shows only regression coefficients for variables of interest and omits information about coefficients for control variables.

The undertaken empirical analysis showed that the mentioned below relations turn out to be stronger in the subsample of countries with high-quality institutions. In particular, this is expressed:

- for indicators of institutional trust and reduced number of visits to grocery and pharmacy;
- for the indicator of dislike of free riding and decreased number of visits to grocery and pharmacy; workplaces; parks, public gardens and dog parks.

Table 3. Relationship between generalized trust, dislike of free riding and changes in mobility

	Dependent variable: Changes in mobility in the following places:					
	Retail and recreation (1)	Grocery and pharmacy (2)	Parks, etc. (3)	Transit stations (4)	Workplaces (5)	Residential (6)
phase* Generalized trust	0.232*	-0.0003	0.447*	0.221*	0.065	-0.113**
phase* Dislike of free riding	-0.063	-0.129**	-0.335***	-0.057	-0.099**	0.060**
Stringency index	-0.603***	-0.390***	-0.508***	-0.570***	-0.496***	0.207***
New COVID-19 cases	-0.0003	-0.0001	-0.001	-0.0003	-0.0003	0.0001
phase* Population density	-0.003	-0.005*	-0.005	-0.002	-0.0001	0.001
phase* per capita GDP	-0.0002	0.0002	-0.0001	-0.0002*	-0.00001	0.0001*
Measurements	3,782	3,781	3,782	3,782	3,782	3,782
within-R ²	0.315	0.117	0.089	0.335	0.223	0.237
F-statistic	336.639***	97.183***	71.562***	368.447***	209.957***	226.654***
	3,534	3,533	3,534	3,534	3,534	3,534
	0.314	0.121	0.103	0.320	0.219	0.245
	311.751***	94.093***	78.061***	321.460***	191.103***	221.653***

* 10% significance level, ** 5% significance level, *** - 1% significance level.

Source: authors' calculations.

Notes: Exclusion of insignificant control variables does not lead to changes in conclusions about variables of interest.

The number of observations for models with the variable of interest Dislike of free-riding is less, since WVS lacks data on this indicator for Belarus, Jordan, Lebanon and Mexico.

Table 4. Relationship between indicators of institutional trust and norms of cooperation and changes in mobility

Institutional trust and changer in mobility												
Dependent variable:												
Changes in mobility in the following places:												
	Grocery and phar-macy	Parks, etc.	Work-places	Residen-tial	Grocery and phar-macy	Parks, etc.	Work-places	Residen-tial	Grocery and phar-macy	Parks, etc.	Work-places	Residen-tial
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
phase * Trust in the government	-0.113**	-0.193**	-0.075*	0.043*								
phase * Trust in the courts					-0.093**	-0.198**	-0.065*	0.038*				
phase * Trust in the police									-0.089**	-0.199***	-0.058	0.034*
Stringency index	-0.407***	-0.509***	-0.510***	0.213***	-0.403***	-0.499***	-0.507***	0.212***	-0.399***	-0.488***	-0.504***	0.210***
New COVID-19 cases	-0.0001	-0.001	-0.0004	0.0002	-0.0001	-0.001	-0.0004	0.0002	-0.0001	-0.001	-0.0004	0.0002
phase* per capita GDP	0.0003***	0.001**	0.0001**	-0.0001**	0.0003***	0.001***	0.0001**	-0.0001**	0.0003***	0.001***	0.0001**	-0.0001**
phase * Population density	0.005	0.017**	0.007	-0.005*	0.003	0.017**	0.007	-0.004*	0.002	0.015**	0.005	-0.003*
Observations	3,719	3,720	3,720	3,720	3,719	3,720	3,720	3,720	3,719	3,720	3,720	3,720
within-R ²	0.142	0.098	0.243	0.258	0.138	0.100	0.241	0.255	0.139	0.102	0.241	0.254
F-statistics	118.831***	78.381***	230.244***	249.463***	115.142***	79.584***	228.271***	245.806***	115.767***	81.897***	227.922***	244.934***

* p<0.10
** p<0.05
*** p<0.01

* 10% significance level, ** -5% significance level, *** - 1 % significance level.

Source: authors' calculations.

Note: Exclusion of insignificant control variables does not lead to any changes in conclusions about variables of interest.

The table does not include results for the variables Retail and recreation and transit stations, since there is no significant relationship with variables of interest identified for these categories.

Table 5. Relationship between various components of social capital and changes in mobility in subsamples of countries with high and low-quality institutions

	Dependent variable: Changes in mobility in the following places:											
	Subsample of countries with high-quality institutions					Subsample of countries with low-quality institutions						
	Retail and recreation	Grocery and pharmacy	Parks, etc.	Transit stations	Workplaces	Residential	Retail and recreation	Grocery and pharmacy	Parks, etc.	Transit stations	Workplaces	Residential
phase * Generalized trust	0.273	-0.010	0.919	0.039	-0.090	-0.055	0.232	0.080	0.595 ^{***}	0.344 ^{**}	0.214	-0.167 ^{**}
phase * Dislike of free riding	-0.136	-0.213 ^{***}	-0.588 ^{**}	-0.145 [*]	-0.137 ^{***}	0.056	-0.020	-0.084	-0.110	-0.028	-0.089	0.062 [*]
phase * Trust in the government	-0.061	-0.133 ^{**}	-0.272	-0.042	-0.044	0.021	-0.005	-0.103 [*]	-0.031	-0.001	-0.085 [*]	0.053 [*]
phase * Trust in the courts	-0.075	-0.142 ^{***}	-0.327	-0.069	-0.060	0.027	0.018	-0.078	-0.033	0.006	-0.073 [*]	0.048 [*]
phase * Trust in the police	-0.081	-0.136 ^{***}	-0.350 [*]	-0.076	-0.060	0.030	0.004	-0.090	-0.042	-0.008	-0.077 [*]	0.047 ^{**}

* 10% significance level, ** -5% significance level, *** - 1 % significance level.

Source: authors' calculations.

Note: The table shows only regression coefficients for variables of interest. Basic specification of the model is similar to the models presented in Tables 3-4.

Although a general nature of the relationship between decreased mobility and indicators of institutional trust and dislike of free riding remain in a subsample of countries with low-quality institutions, the number of statistically significant relations between the indicators is much smaller and the relations themselves are much weaker than in the subsample of countries with high-quality institutions (a five percent statistically significant relationship was registered only for indicators of police trust and increased length of stay in residential areas).

Such results confirm the assumption that presence of high-quality institutions and bona fide guarantors of the rules, overseeing application of punishment to violators, increases, on the one hand, the level of confidence in the state-imposed measures and, on the other hand, inclination to comply with the rules adopted in society (supported by both society in general and the state).

However, it is interesting that there are no statistically significant relations between indicators of generalized trust and indicators of mobility in the subsample of countries with high-quality institutions and presence of several relations in the subsample of countries with low-quality institutions. Thus, a higher level of trust is associated there with a higher frequency of visits to parks (1-% significance level) and public transport stations (5-% significance level), as well as with decreased length of stay in residential areas. This result can suggest that higher indicators of generalized trust are associated with less fears of opportunistic behavior on the part of other people who do not observe self-isolation if got ill. As a result, taking into account less fear of being punished (in conditions of a lower level of corruption control in society), this manifests in a lower inclination to stay at home in order to protect their health and in greater readiness for relatively safe mobility (visiting parks, etc.).

6. Discussion

The cross-country sample results of the analysis of relationship between generalized, institutional trust, norms of cooperation and changes in mobility generally confirm results of other studies on this topic based on alternative data sources, as well specify conclusions about the nature of relationships depending on the quality of institutions (Romano et al. 2021).

The key results of this study are related, first, to identification of the nature of relationship between various components of social capital and mobility indicators for different categories of public places in the cross-country sample. Second, to validation of sustainability of conclusions for different groups of countries – with high and low-quality institutions (high and low levels of corruption control, respectively).

The analysis confirms the mechanisms described in section 2, as well as allows to confirm the existence of relationship between various components of social capital and mobility during the pandemic.

Moreover, the higher significance in reducing mobility (especially for the category of grocery and pharmacy) is associated with institutional trust and dislike of free riding (Hypotheses 2-3). The greatest effect is seen in countries with high-quality institutions (high level of corruption control in society). High indicators of generalized trust, on the contrary, do not result in decreased mobility (Hypothesis 1), while in countries with low-quality institutions they even contribute to increased mobility (for transit stations, parks, public gardens, etc.).

However, the obtained results have certain limitations. In particular, the revealed relationship between indicators of social capital and indicators of the pandemic containment are

correlative. A current lack of data makes it impossible to exclude the problem of endogeneity (for example, effective containment of the pandemic in the country could contribute to higher trust in institutions). However, given relatively slow changes in culture (Williamson 2000), it can be expected that it is social capital that is a factor for the pandemic containment, and not vice versa. To further validate sustainability of the study results, it is expedient to conduct additional studies based on data on later stages of the pandemic for different categories of countries.

What is the implication for Russia? Given the relatively low level of corruption control in society, low generalized trust (in Russia, the share of people who believe that most people can be trusted equals to 22.9%, according to the World Values Survey, 2017-2020) can suggest that residents of Russia, other things being equal (and in the case of perception of real risk of the pandemic) can be more careful in communication with other people and are more likely to reduce mobility because of the fear of infection. However, relatively low indicators of institutional trust, other things being equal, can lead to distrust in measures introduced by the state to contain the pandemic (social distancing measures, lockdown, digital passes, vaccination, etc.) and reluctance in implementation. In addition, a tolerant attitude towards free riding in society means that, other things being equal, people may be more inclined to receive the perceived (and often false) individual benefits (“I will not restrict my mobility and change my usual lifestyle”; “I will not be vaccinated, better others do it,” etc.) to the detriment of the collective benefit – limiting spread of the pandemic and forming collective immunity.

Altogether, this means that in the short term, implementation of measures to curb the pandemic spread in Russia should be based on the fact that the level of public acceptance of containment measures introduced by the state may be low. This determines, on the one hand, the importance of building a “customized” communication strategy for different socio-demographic groups of population (with different levels of education, dwellers of settlements of different size; with different levels of institutional trust and development of cooperation norms) (see, for example, Antonov et al. 2019), and, on the other hand, the importance of accompanying the introduced measures to contain the pandemic with a built-up incentive system that increases benefits of complying with the rules imposed by the state or imposes additional expenses on a person in case of violation. Examples of such measures are incentive payments to the elderly for compliance with quarantine or isolation, inability to access public places without a medical mask or vaccination certificate; ban on public transport privileges; fines for violating self-isolation regime, etc.

Additional promising areas of research are related to the use of the basics of behavioral economics together with the use of cultural characteristics in the design of measures to contain the pandemic rather than the use of cultural characteristics only. For example it is worth to consider the significance of reference points for a person in decision making (Briscese et al. 2020; Kim 2021) or consideration of the effect of positive and negative reciprocity (Falk, Fischbacher 2006).

7. Conclusion

The fight against the coronavirus pandemic has become a serious challenge for the whole world. Effectiveness of the pandemic containment turned out to rather depend upon public response to restrictive measures largely depending on the specifics of social capital of the community and quality of institutions than only actions of governments.

This article has tested hypotheses about the relationship between various components of social capital and changes in mobility during the pandemic.

Results of the empirical testing of hypotheses make it possible to conclude that high levels of trust in the government, police and courts, as well as high level of the norms of cooperation (dislike of free riding), other things being equal, contribute to reduced mobility during the pandemic and containment of the coronavirus spread. This effect is particularly pronounced in countries with high-quality institutions. A high level of generalized trust, on the contrary, does not result in decreased mobility during the pandemic, limiting the containment capacity, especially in countries with low-quality institutions. At the same time it is important to keep in mind that social capital is not the main and only factor in containing the pandemic.

The results obtained also imply that development of short-term measures aimed at containing the pandemic in the country and adapting international experience, should be based on both specific features of the institutional environment and the level of various components of social capital. In the mid and long-term perspective, it is important to take a set of measures aimed at increasing the level of corruption control in society rather than only strengthening institutional trust and developing norms of cooperation. In particular, this can be facilitated by a system of measures aimed at establishing a constructive dialogue between the state and society through higher information openness of state authorities, increased ability of the population to monitor fulfillment of state obligations, public involvement in the budget planning process, etc.

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Annex 1. Distribution of countries by subsample of countries with high and low-quality institutions

Ranking	Country (high-quality institutions)	Corruption control
1	New Zealand	100.0
2	Finland	99.0
3	Sweden	98.6
4	Denmark	97.6
5	Norway	97.1
6	Netherlands	96.6
7	Switzerland	96.2
8	Germany	95.2
9	Australia	94.2
10	Great Britain	93.8
11	Austria	90.9
12	Estonia	90.4
13	Japan	89.9
14	France	88.9
15	USA	84.6
16	Chile	83.2
17	Portugal	77.4
18	South Korea	76.9
19	Lithuania	74.5
20	Georgia	74.0
21	Spain	73.6
22	Poland	71.2

Ranking	Country (low-quality institutions)	Corruption control
23	Czech Republic	68.8
24	Slovakia	64.4
25	Malaysia	62.5
26	Italy	62.0
27	Jordan	60.6
28	Croatia	60.1
29	Hungary	57.7
30	Greece	56.3
31	Belarus	53.8
32	Argentina	53.4
33	Romania	51.4
34	Bulgaria	50.5
35	Colombia	48.1
36	Turkey	44.7
37	Kazakhstan	43.8
38	Brazil	42.3
39	Thailand	39.4
40	Indonesia	38.0
41	Serbia	37.0
42	Peru	36.5
43	Ecuador	34.6
44	Vietnam	34.1
45	Philippines	31.3
46	Bosnia and Herzegovina	30.3
47	Egypt	27.9
48	Ukraine	26.4
49	Bolivia	26.0
50	Mexico	22.6
51	Russia	21.6
52	Pakistan	21.2
53	Guatemala	18.8
54	Kyrgyzstan	17.3
55	Bangladesh	16.3
56	Nigeria	13.0
57	Nicaragua	12.5
58	Lebanon	12.0
59	Zimbabwe	10.1
60	Tajikistan	9.1
61	Iraq	8.7

Annex 2. Descriptive statistics used in the data analysis

Variable	Average	Mean	Standard deviation	Minimum	Maximum
Changes in mobility (changes in frequency and length of stay in public places compared to baseline), %					
• Retail and recreation	-33.13	-30.00	32.86	-97.00	29.00
• Grocery and pharmacy	-14.59	-6.00	24.27	-97.00	76.00
• Parks, public gardens, dog parks	-13.28	-8.00	35.88	-95.00	188.00
• Transit stations	-33.48	-34.00	31.94	-95.00	27.00
• Workplaces	-25.49	-23.00	28.82	-90.00	34.00
• Residential	11.63	9.50	11.82	-6.00	51.00
Generalize trust	25.55	20.60	18.68	2.10	74.10
Trust in the government	75.85	75.40	15.19	41.90	99.00
Trust in the courts	83.30	84.50	13.55	37.80	99.20
Trust in the police	87.65	91.45	11.37	53.70	99.00
Norms of cooperation (dislike of free riding)	49.36	49.60	15.77	19.50	86.20
Smoothed daily new confirmed Covid-19 cases	506.8	18.3	2429.5	0	32284.1
Stringency index	51.68	58.33	33.69	0.00	100.00
Per capita GDP	20292.8	9946.0	20566.8	870.8	81993.7
Population density	142.56	84.63	193.70	3.25	1239.58

Annex 3. Results of the models' specification without variables of interest

	Dependent variable:					
	Retail and recreation	Grocery and pharmacy	Parks etc.	Transition stations	Workplaces	Residential
	(1)	(2)	(3)	(4)	(5)	(6)
Stringency index	-0.603***	-0.390***	-0.509***	-0.570***	-0.496***	0.207***
New cases of COVID-19	-0.0004	-0.0001	-0.001	-0.0003	-0.0003	0.0002
phase * per capita GDP	0.00002	0.0002***	0.0004**	-0.00004	0.0001	-0.00002
phase * population density	-0.001	-0.005 [†]	-0.0001	-0.0002	0.001	-0.001
Observations	3,782	3,781	3,782	3,782	3,782	3,782
within -R ²	0.311	0.117	0.084	0.331	0.223	0.230
F-statistics	412.808***	121.512***	83.821***	451.473***	261.983***	273.654***

* 10% significance level, ** -5% significance level, *** - 1% significance level.

Source: authors' calculations.

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