The Moderating Effect of Social Capital on Fiscal Policy Responses to COVID-19: Cross-Country Evidence*

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SUMMARY

This study suggests that an adequate level of social capital with a robust health profile might be associated with positive policy outcomes in combating COVID-19. We investigate the effect of interaction between fiscal policy responses and social capital on the spreading of the pandemic, by considering the country health profile, demographic and economic factors, in a cross-section of 94 countries. Firstly, the results of the analysis indicate the moderating effect of social capital on keeping the pandemic under control through fiscal policy measures. In particular, strong bilateral and family ties as well as better coordination and cooperation at the community level can facilitate the goal of fiscal policy measures. The results also reveal that the declining effect of fiscal policy on the pandemic mostly arises from the relatively high social capital levels, while it loses its effectiveness at low levels. Secondly, the findings emphasize the role of behavioural risk factors, care systems and preventative interventions as prominent determinants of surviving in pandemic. Thirdly, we conclude that taking specific measures for identified vulnerable and high-risk groups is quite important in overcoming the disease.

Key words: COVID-19, Pandemic, Social capital, Fiscal policy

JEL: C1, H3, H8

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1. Introduction

Due to the COVID-19 pandemic, a shrinking of the global economy is estimated of up to $2 trillion by the end of 2020 (United Nations, 2020). Considering the millions of cases and thousands of deaths, governments have announced a range of fiscal and monetary stimulus to slowdown the immediate impact of the virus. Isolation and restriction measures are being pursued under some challenges in the social sphere and health systems. The effectiveness of such precautions could be determined by the commitment to action plans as well as some preparatory conditions based on social structure and health system (Alina Kristin Bartscher et al. 2020; Anna S. Y. Wong and Jillian C. Kohler 2020; Cary Wu 2021).

Fiscal policy can provide more accurate tools with spending and taxing actions when there is a need for rapid solutions to protect society in times of disaster (Philip Arestis 2011). The announced fiscal measures reached about $8 trillion in the first quarter of the year (Vitor Gaspar, W. Raphael Lam and Mehdi Raissi 2020). Based on the effectiveness of fiscal responses, we suggest that an adequate level of social capital with a robust health profile at a national level might be associated with positive policy outcomes in combating the pandemic. In this study, we investigate the effect of interaction between fiscal policy responses and social capital on the spreading of the pandemic by considering the country health profile, demographic and economic factors. The dataset of the study includes 94 countries and was obtained from various databases as well as our own calculations. The following section presents an overview of theoretical background and current literature related to the role of social capital and public health in times of pandemics. Section 3 summarizes the fiscal policy responses to COVID-19 worldwide, while the empirical framework is introduced in section 4. Section 5 reports the analysis results; and the last section concludes the paper.

2.Social Capital and Public Health in Pandemics

Over the last three decades, the social capital theory has been discussed within a variety of disciplines in social sciences. Following Emile Durkheim’s (1951) early contribution, the concept of social capital has been popularized particularly by Pierre Bourdieu (1986), James Coleman (1988) and Robert D. Putnam (1993). Bourdieu (1986) defines social capital as an aggregation of common resources that stem from networking and grouping which in turn provide a collectively owned capital to community members. Coleman (1988) emphasizes the role of social structures that enable some personal or corporate benefits to accrue. These benefits partly arise from externalities embodied in some kind of social rules. Also, members of societies with strong norms can avoid some actions that may lead to negative consequences. In this context, social capital is considered as a public good that increases the perceived life quality of individuals by means of complex ties among the family and society. Putnam (1993) refers to social capital as a stimulus for social cohesion and solidarity with a high degree of trust, civic and social engagement, volunteering and interpersonal relationships in order to achieve better social and economic outcomes. These resources may enhance coordination and cooperation in solving uncertainties arising from imperfect information and enforceability in community context. Putnam suggests that the quality of social capital is decisive in the success of public policies. Accordingly, an adequate level of social capital creates more credible public institutions through a high degree of trust.

Regarding past pandemics, there are few empirical researches dealing with the role of social capital in literature. A study by Ying-Chih Chuang et al. (2015) shows that social capital may influence the response to a pandemic via institutional trust, local and interpersonal networks. Similarly, Howard K. Koh and Rebecca O. Cadigan (2008) address the integral role of social capital in mitigating and recovering pandemic through preparedness and strengthening of local communities with bonding and bridging. Accordingly, a community with social cohesion and in which there is support for family members and others may be better able to recover from a pandemic. The bonding effect of social capital mostly arises from local groups with particular characteristics and close relationship, while the bridging effect is associated with diversified networks accessed by different groups. Besides, norms and networks of trust that unite individuals and groups within formal or institutionalized authority constitute the linking effect of social capital (Spencer Moore and Ichiro Kawachi 2017). Social capital might also promote a better health status in certain types of communities, providing interpersonal trust, civic engagement and geographically wider networks (Stephen Baron, John Field and Tom Schuller 2001). In the context of measures taken for public health, social settings could enable coordination and cooperation in mutually beneficial ways. These settings are linked to family order, workplace organization and neighbourhood in a community context with either weak or strong ties (Annahita Ehsan et al. 2019). Lorenzo Rocco and Marc Suhrcke (2012) underline the enhancing effect of individual social capital on good health if the community level social capital is evenly distributed across the social sphere. Moreover, recent studies on COVID-19 point to some significant implications for social capital. Bartscher et al. (2020) argues that areas with high social capital could control the virus better than areas with relatively low social capital, without being subject to any restriction. Similarly, Makridis and Wu (2020) show that social capital can enable a greater public awareness with more hygienic practices and social distancing. However, a higher level of social capital may trigger in-person interaction and, in turn, risk of contagion. Wu (2021) demonstrates the unique role of individual social capital in facilitating collective actions based on norms and trust, and in promoting public acceptance and compliance with measures. It is also seen that social capital can increase the resource mobility through community-level networks.

Another influencing factor in the response to the pandemic is public health. Healthy individuals are more adaptable to changes in the socio-economic sphere and thus can contribute more to the recovery phase. (Pablo Daniel Monterubbianesi, Martín Grandes and Carlos Dabús 2017). Historical experience shows that the pandemic may cause high mortality rates, especially in less developed countries, due to inadequate access to medical care, poor public health infrastructures and preventative interventions, behavioural risk factors that increase the likelihood of developing disease and illness, population density and physical factors including nutritional habits and wellness (Hitoshi Oshitani, Taro Kamigaki and Akira Suzuki 2008; Nita Madhav et al. 2018). Existing responses to bring the pandemic under control depend heavily on critical infrastructures hosting a complex and interdependent health system. A failure in such infrastructures leads to inevitably undesirable results on current efforts (Ralf Itzwerth et al. 2006).

3.Fiscal Responses to COVID-19

The spread of the COVID-19 pandemic is resulting in a health crisis and a downgrade in economic activity that are unprecedented in recent history. Containment and mitigation of the pandemic spread has been the first priority of public authorities, to save and protect lives, relieve the pressure on healthcare systems and prepare for the worst-case scenario. Although the measures taken against the pandemic place an important burden on governments, most of them have sudden and profound economic and social impacts. OECD (2020a) states that the containment measures could lead to an initial decline in output of between one-fifth and one-quarter in many economies, with falling consumer spending by about one-third. In such a situation, monetary policy tools may be a blunt option due to insufficient demand and supply shock. Thereby, governments have activated aggressive fiscal policy to achieve a rapid and extensive recovery through triggering economic activity of firms and households and preserving productive capacity of countries. Also, international collaboration will be essential for strengthening the global economy's resilience to future shocks (OECD 2020b).

There are large variations in the size of fiscal packages, which have unique measures and action plans. As seen in Figure 1, Germany, Italy, Japan, France, Australia, Belgium, USA, Iran, Luxembourg and Sweden announced high amounts of funding with respect to their GDP, while the share of measures is relatively low in countries such as Uruguay, Nigeria, Argentina and Costa Rica. These packages mostly include (i) additional funds to the health sector, (ii) sovereign guarantees, (iii) tax deferrals, (iv) transfers to poor families, (v) grants to SMEs and self-employed, (vi) support for workers and vulnerable groups, (vii) payroll tax relief for businesses, (viii) relief for households (discount utility bills, cash payments) and (ix) wage contribution to employers (IMF 2020a).

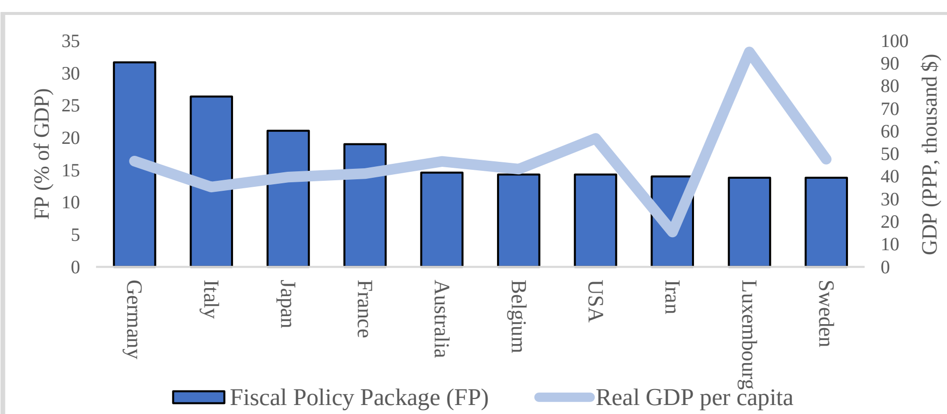

Figure 1 Top 10 Countries According to Announced Fiscal Policy Packages*

Source: IMF (2020) and authors' calculation.

* Based on 15 May 2020 data.

Regarding intensive efforts of countries, some implications about the goals of fiscal policy in the current crisis can be as follows. Firstly, spending measures to provide test kits, drugs and vaccine for isolating the virus. Secondly, disaster relief to vulnerable households and firms to enable them to survive for a few months. Also, financial relief to firms faced with possible bankruptcy and extreme difficulties, to avoid permanent damage to the economy. Thirdly, supporting aggregate demand in the economy, which is currently impaired due to profound health measures, to adjust its potential (Olivier Blanchard 2020).

An effective fiscal stimulus depends on various factors, including the size of multipliers, institutionalization, public savings, revenue-raising capacity and accessibility of financial markets (World Bank 2020a). In the context of fiscal stimulus during the recovery phase, there is a need for well-calibrated and well-targeted action plans, considering the differences across sectors and business structures. Governments must be careful in making decisions for the part of the economy that no longer needs help, while sparing no expense on the health sector. Also, it is essential to support the primary sectors that still require funds and incentives. Fiscal stimulus should include immediate spending and be trustworthy and well-communicated, to avoid loss of further confidence or being absorbed mostly in increased savings instead of consumption (Alejandro Izquerdo and Martin Ardanaz 2020; Jason Furman 2020).

4.Data and Empirical Method

In the analysis, we examine whether there is a moderating effect of social capital on fiscal policy responses to COVID-19 pandemic. Also, we take into account country health profile and its elements, as well as demography of the population by risk factors and economic wellbeing. The dataset consists of a cross-section of 94 countries depending on eliminating the outliers in terms of both dependent and explanatory variables. As part of the pandemic spread, we obtain immediate data from the "Worldometer" website (2020) and calculate a basic index as a dependent variable, in order to measure extent to which pandemic spreads over time. Considering the relative rate of spread is the rate at any particular point in time in a given population, calculation of the index is given in below.

$$SI_i = \frac{\dfrac{\sum_{i=1}^{t} case_i / \sum_{i=1}^{t} test_i}{population_i}}{\sum_{i=1}^{t} duration_i}.100 \qquad (1)$$

In equation (1), the spreading index (*SI*) of country *i* is the average number of COVID-19 cases in total number of daily diagnostic tests, relative to country population and pandemic duration (days). Firstly, relative case rate in total tests depends on country population. Accordingly, the higher the population of country *i* in a given relative case rate and duration, the lower the index will be (or vice versa). Secondly, the speed of spread equals the distance travelled by the pandemic divided by duration. The pandemic duration is determined by the interval between the date of the first proven COVID-19 case in country *i* and 15 May 2020. Thus, we also consider the country differences in the spread of the pandemic over time. Definitions of dependent and explanatory variables are given in Table 1.

Table 1 Definition of Variables

Type	Variables [with abbreviations]	Unit / Definition
D.V.	Spreading index [***SI***]	Authors' calculation
E.V.	Fiscal policy measures to COVID-19 [***FP***]	% of GDP
	Social capital (Pillar) [***SC***] - Civic and social participation (Element 1) [***SC_1***] - Institutional trust (Element 2) [***SC_2***] - Interpersonal trust (Element 3) [***SC_3***] - Personal and family relationship (Element 4) [***SC_4***] - Social networks (Element 5) [***SC_5***]	Index values
	Health profile (Pillar) [***HE***] - Behavioural risk factors (Element 1) [***HE_1***] - Care systems (Element 2) [***HE_2***] - Preventative interventions (Element 3) [***HE_3***] - Mental health (Element 4) [***HE_4***] - Physical health (Element 5) [***HE_5***]	Index values
	Population in risk group [***POP***]	Population ages under 20 and above 65 (% of total population)
	Economic wellbeing [***GDP***]	Real GDP per capita (PPP, thousand $)

The fiscal policy measures are considered as a percentage of country GDP. We take into account exact measures reported in the IMF "Policy Tracker" as of 25 April 2020. Also, we include the three-month amounts for the monthly packages announced in Malta, Portugal and Slovakia. Most of the data are compiled from the IMF "Policy Tracker" (2020a) which summarizes the key economic responses of governments. In addition, the dataset comprises some external resources, including ILO (2020) (for Costa Rica, Croatia, Jordan, South Africa and Trinidad and Tobago), KPMG (2020) (for Hong Kong), the World Bank (2020b) (for Kyrgyzstan), the Arab News (2020) (for Lebanon) and the Intellinews (2020) (for Uzbekistan). We use the "Legatum Prosperity Index 2019" (Legatum Institute 2019) for social capital and health profile variables. The index aims to measure prosperity using a multi-dimensional concept across countries. Social capital as a pillar of the index consists of five elements: (i) civic and social participation, (ii) institutional trust, (iii) interpersonal trust, (iv) personal and family relationship and (v) social networks. Similarly, the health pillar has six elements, namely (i) behavioural risk factors, (ii) care systems, (iii) preventative interventions, (iv) mental health, (v) physical health and (vi) longevity. In the study, we prefer to use five of the six health elements except longevity which measures the mortality rate of a country. Thus, country scores of both pillars and elements are included in the analysis. The coverage of each element is summarized in Table 2.

Table 2 The Coverage of Social Capital and Health Elements

SC Elements	Coverage	HE Elements	Coverage
Civic and social participation	the extent to which individuals participate within a society in civic and social spheres.	*Behavioural risk factors*	lifestyle patterns that increase possibility of developing disease, injury or illness, or of suffering from premature death.
Institutional trust	the extent to which individuals trust their institutions in actions.	*Care systems*	the ability of a health system to treat and cure diseases and illnesses.
Interpersonal trust	the extent to which individuals trust strangers and those outside their known social sphere.	*Preventative interventions*	the extent to which a health system prevents diseases, illnesses and other medical complications.
Personal and family relationship	the extent to which the closest-knit personal relationships and family ties (emotionally, mentally and financially).	*Mental health*	the level and burden of mental illness on the living population.
Social networks	the extent of opportunities that an individual has with people in their wider networks (social groups, neighbours etc.).	*Physical health*	the level and burden of physical illness on the living population.

Source: Legatum Institute, 2019.

Recent reports by several organizations, including WHO (2020), Centers for Disease Control and Prevention (2020) and other healthcare institutions at national level, indicate that young people, especially of school age, face a substantial risk of illness and hospitalization from the pandemic, as well as older adults and those with other underlying health problems. In this regard, we define a risk group variable for each country, as a share of those under age 20 and over age 65 in the total population. The population data by age groups is compiled from the "World Development Indicators" database (World Bank 2020c). In the analysis, we also use real GDP per capita (PPP, 2011 international dollar) variable to control for economic wellbeing of the citizens in each country. The data of this variable are obtained from the IMF (2020b) "World Economic Outlook Database". Descriptive statistics of all variables and the list of countries are given in the Appendix.

The estimation models used in the analysis mainly investigate the effect of interaction between fiscal policy measures and social capital on the pandemic spread. In addition to social capital as a moderating variable, country health profile, population in risk group and economic wellbeing variables are included in all the models. The base regression model is given below:

$$SI_i = \gamma_0 + \alpha_1 FP_i + \alpha_2 SC_i + \alpha_3 HE_i + \alpha_4 POP_i + \alpha_5 GDP_i + \varepsilon_i \quad (2)$$

The left side of equation (2) represents dependent variable (*SI*), while the constant term, a set of explanatory and control variables (*FP, SC, HE, POP, GDP*) and error term are given in the right side, respectively. Our model specification consists of two parts. Firstly, we estimate the base model without interaction and a set of alternative models with each *SC* element by OLS method, in order to obtain comparative results. Secondly, we examine the alternative models with interaction through both pillars and elements of *SC* and *HE*. In these models, we also include interaction terms with mean centring *FP*, *SC* and its sub-elements (*SC_1*, *SC_2*, *SC_3*, *SC_4*, *SC_5*). In estimation step, we use robust standard errors to obtain unbiased standard errors of OLS coefficients under heteroscedasticity.

5.Results and Discussion

Results of the OLS estimation with robust standard errors are reported in Table 3 and Table 4, which consist of a total of 37 models given in eight groups. In Table 3, group A includes the coefficients of six models without interaction. At first glance, there is no notable effect of fiscal policy and social capital pillar on *SI*, whereas negative effect of interpersonal trust (*SC_3*) is statistically significant. However, we obtain a contrast result for social networks (*SC_5*) in model (6A). This result may give some clues that being a member of a wider social network may trigger the likelihood of contagiousness. Regarding models with interaction term from group B to H, the mean centred variables are given by the "c" subscript notation (FP_C, SC_C). Among them, we obtain some significant results for interaction between fiscal policy and social capital by both pillar and element levels. These results are interpreted below.

Table 3 OLS Results with Pillar Level

A: Models without Interaction							B: Interaction with SC Pillar (by Health Pillar)	
VAR.	**(1A)**	**(2A)**	**(3A)**	**(4A)**	**(5A)**	**(6A)**	**VAR.**	**(1B)**
Const.	.4660 (.380)	.5004 (.398)	.4816 (.377)	.4346 (.372)	.4165 (.329)	.4170 (.354)	**Const.**	.5506 (.459)
FP	.0013 (.002)	.0013 (.002)	.0013 (.002)	.0014 (.002)	.0013 (.002)	.0014 (.002)	**FP_C**	.0024 (.003)
POP	.0039 (.003)	.0038 (.003)	.0045[c] (.002)	.0057[b] (.002)	.0048[c] (.002)	.0044[c] (.002)	**POP**	.0046[c] (.003)
GDP	.0009 (.001)	.0011 (.001)	.0016 (.001)	.0022[b] (.001)	.0012 (.001)	.0013 (.001)	**GDP**	.0011 (.001)
HE	-.0086[c] (.005)	-.0084[c] (.005)	-.0080[c] (.005)	-.0078[c] (.005)	-.0106[c] (.005)	-.0098[b] (.005)	**HE**	-.0091[c] (.005)
SC	.0012 (.002)						**SC_C**	.0013 (.002)
SC_1		.0028 (.004)					**SC_C* FP_C**	-.0004[c] (.000)
SC_2			-.0033 (.007)					
SC_3				-.0108[b] (.005)				
SC_4					.0150 (.010)			
SC_5						.0130[b] (.006)		
R^2	0.247	0.246	0.247	0.274	0.290	0.277	**R^2**	0.264
p(F)	0.033	0.062	0.045	0.009	0.021	0.041	**p(F)**	0.026

Notes: Robust standard errors are reported in parenthesis. The superscripts (a), (b) and (c) denote 1%, 5% and 10% significance levels, respectively. According to Durbin-Wu-Hausman (DWH) test results, there is no endogeneity problem in all models.

In Table 3, the coefficient of interaction term for social capital (*SC*) and fiscal policy in model (1B) with health profile pillar is negative and the significance level is at 10%. This result shows that the fiscal policy measures cause a decreasing effect on pandemic spread, while the level of social capital rises. In other words, it indicates the moderating effect of social capital on controlling the pandemic spread through fiscal policy measures. Also, the R^2 of the model turns out to be higher compared to base model (1A) in the first group.

According to Table 4, the coefficient of civic and social participation (*SC_1)* is significantly negative at 5% level in model (1C). A high degree of participation in society may facilitate action plans against the pandemic through collectivity and solidarity. However, better coordination and cooperation within the community might enable the feasibility of public decision-making. As a whole, such intangibles increase the effectiveness of policy measures. In model (4C), the interaction term including personal and family relationship (*SC_4*) has a negative sign with 1% significance. It provides strong evidence that such relationships are a prominent determinant in responses to mitigate the pandemic. In particular, strong bilateral ties can assist individuals who are undergoing quarantine, via increasing emotional and mental motivation, as well as providing financial support from kinship or close friendship circles. In the context of models from group (D) to (H), we investigate the interaction between fiscal policy and *SC* elements using each element of *HE* separately. Model (5D) confirms the findings of model (1C) with negative and significant sign of *SC_1*. In parallel to model (4C), we reach the same results in all models in group G, except (1G). Besides, the model (2G) and (3G) have relatively higher R^2 values of .347 and .321, respectively. On the contrary, we obtain negative but insignificant results for interaction term with institutional trust (*SC_2*) in model (2C) and group E models.

In all models, the coefficients of health profile (*HE*) pillar are significantly negative. As expected, initial conditions about public health are decisive to control the pandemic spread. In particular, it has been observed that case-related deaths in many countries are due to insufficiencies in health infrastructure and equipment. Considering the elements of *HE*, it is clearly seen that behavioural risk factors (*HE_1*), care systems (*HE_2*) and preventative interventions (*HE_3*) in all models from group (D) to (H) have a significant effect on the spread of contagion. Specifically, a better lifestyle safeguarding the individual from the causes of disease and illness also increases the probability of surviving the pandemic. In addition, a well-designed health system with better diagnosis and treatment and a sufficient infrastructure based on hospitalization and intensive care units could support a pattern of healthy life. Besides, preventative interventions with advanced care systems are another essential determinant of public health in case of pandemic.

Lastly, the evidence in almost all models (except 1A, 2A and 1C) points out the increasing effect of risk group population (POP) on pandemic. This reveals that identifying such risk groups and taking specific measures by the public authority are quite important in overcoming the disease.

Table 4 OLS Results with Element Level

C: Interaction with SC Elements (by Health Pillar)

VAR.	(1C)	(2C)	(3C)	(4C)	(5C)
Const.	.5340 (.420)	.4466 (.383)	.3624 (.383)	.5708 (.405)	. 6215 (.413)
FP_{C}	.0026 (.003)	.0013 (.002)	.0011 (.003)	.0028 (.008)	.0014 (.002)
POP	.0042 (.003)	.0046^{c} (.002)	.0057^{b} (.002)	.0063^{a} (.002)	.0043^{c} (.002)
GDP	.0011 (.001)	.0018 (.001)	.0023^{b} (.001)	.0015 (.001)	.0013 (.001)
HE	-.0087^{c} (.005)	-.0080^{c} (.004)	-.0078^{c} (.005)	-.0106^{b} (.005)	-.0101^{b} (.005)
SC_1_{C}	.0025 (.004)				
SC_2_{C}		-.0037 (.007)			
SC_3_{C}			-.0112^{b} (.005)		
SC_4_{C}				-.0089 (.008)	
SC_5_{C}					.0125^{b} (.006)
SC_1_{C}* FP_{C}	-.0011^{b} (.001)				
SC_2_{C}* FP_{C}		-.0003 (.001)			
SC_3_{C}* FP_{C}			.0005 (.001)		
SC_4_{C}* FP_{C}				-.0024^{a} (.001)	
SC_5_{C}* FP_{C}					-.0007 (.001)
R^2	0.260	0.248	0.276	0.323	0.280
p(F)	0.006	0.080	0.019	0.004	0.061

D: Interaction with Element 1 (by Health Elements)

VAR.	(1D)	(2D)	(3D)	(4D)	(5D)
Const.	-.3427^{b} (.159)	.1251 (.124)	.3015 (.307)	-.2069 (.273)	.1554 (.303)
FP_{C}	-.0005 (.003)	.0028 (.003)	.0014 (.003)	-.0002 (.003)	.0011 (.003)
POP	.0064^{b} (.003)	.0056^{b} (.002)	.0051^{b} (.002)	.0083^{a} (.003)	.0057^{b} (.002)
GDP	.0005 (.001)	.0018^{c} (.001)	.0007 (.001)	.0005 (.001)	.0009 (.001)
SC_1_{C}	-.0037 (.004)	.0007 (.004)	-.0005 (.004)	-.0020 (.005)	.0003 (.004)
HE_1	.0244^{c} (.014)				
HE_2		-.0346^{a} (.009)			
HE_3			-.0357^{c} (.020)		
HE_4				-.0121 (.272)	
HE_5					-.0233 (.017)
SC_1_{C}*FP_{C}	-.0004 (.001)	-.0005 (.001)	-.0009 (.001)	-.0009 (.001)	-.0011^{c} (.001)
R^2	0.94	0.269	0.283	0.169	0.212
p(F)	0.040	0.001	0.006	0.033	0.018

E: Interaction with Element 2 (by Health Elements)

VAR.	(1E)	(2E)	(3E)	(4E)	(5E)
Const.	-.3626^{b} (.154)	.1043 (.109)	.2975 (.311)	-.1984 (.254)	.1252 (.291)
FP_{C}	-.0014 (.003)	.0023 (.003)	.0006 (.002)	-.0013 (.003)	-.0002 (.002)
POP	.0058^{b} (.003)	.0057^{b} (.002)	.0050^{b} (.002)	.0080^{a} (.003)	.0057^{b} (.002)
GDP	.0011 (.001)	.0025^{b} (.001)	.0011 (.001)	.0008 (.001)	.0013 (.001)
SC_2_{C}	-.0074 (.006)	-.0044 (.006)	-.0017 (.007)	-.0037 (.006)	-.0041 (.006)
HE_1	.0299^{b} (.012)				
HE_2		-.0352^{a} (.008)			
HE_3			-.0359^{c} (.020)		
HE_4				-.0131 (.025)	
HE_5					-.0223 (.017)
SC_2_{C}* FP_{C}	-.0002 (.001)	-.0004 (.001)	-.0005 (.001)	-.0002 (.001)	-.0001 (.001)
R^2	0.201	0.271	0.278	0.164	0.204
p(F)	0.037	0.009	0.051	0.164	0.134

F: Interaction with Element 3 (by Health Elements)

VAR.	(1F)	(2F)	(3F)	(4F)	(5F)
Const.	-.4089^{a} (.154)	.0366 (.104)	.2131 (.304)	-.2519 (.233)	.0260 (.289)
FP_{C}	-.0012 (.003)	.0018 (.003)	.0003 (.003)	-.0014 (.003)	-.0002 (.003)
POP	.0074^{a} (.003)	.0066^{a} (.002)	.0062^{b} (.002)	.0091^{a} (.003)	.0070^{a} (.002)
GDP	.0013 (.001)	.0026^{a} (.001)	.0017^{c} (.001)	.0015 (.001)	.0018^{c} (.001)
SC_3_{C}	-.0110^{b} (.004)	-.0089^{b} (.004)	-.0114^{b} (.005)	-.0124^{b} (.005)	-.0110^{b} (.005)
HE_1	.0234^{c} (.013)				
HE_2		-.0333^{a} (.008)			
HE_3			-.0354^{c} (.020)		
HE_4				-.0163 (.026)	
HE_5					-.0209 (.018)
SC_3_{C}* FP_{C}	.0002 (.001)	.0007 (.001)	.0004 (.001)	.0003 (.001)	.0003 (.001)
R^2	0.218	0.287	0.308	0.198	0.230
p(F)	0.024	0.003	0.008	0.029	0.036

G: Interaction with Element 4 (by Health Elements)

VAR.	(1G)	(2G)	(3G)	(4G)	(5G)
Const.	-.4096^{b} (.178)	.1234 (.101)	.2433 (.273)	-.2495 (.243)	.1423 (.319)
FP_{C}	.0002 (.003)	.0037^{c} (.002)	.0014 (.003)	-.0001 (.003)	.0012 (.003)
POP	.0081^{b} (.003)	.0078^{a} (.002)	.0070^{a} (.002)	.0099^{a} (.003)	.0075^{a} (.002)
GDP	.0004 (.001)	.0023^{b} (.001)	.0008 (.001)	.0005 (.001)	.0011 (.001)
SC_4_{C}	.0011 (.008)	.0122^{c} (.007)	.0043 (.007)	.0001 (.008)	.0043 (.008)
HE_1	.0244^{c} (.014)				
HE_2		-.0462^{a} (.013)			
HE_3			-.0380^{c} (.019)		
HE_4				-.0160 (.029)	
HE_5					-.0284 (.021)
SC_4_{C}* FP_{C}	-.0021 (.001)	-.0019^{a} (.001)	-.0021^{b} (.001)	-.0024^{b} (.001)	-.0025^{b} (.001)
R^2	0.222	0.347	0.321	0.201	0.258
p(F)	0.069	0.000	0.010	0.066	0.023

H: Interaction with Element 5 (by Health Elements)

VAR.	(1H)	(2H)	(3H)	(4H)	(5H)
Const.	-.3203^{b} (.149)	.1177 (.111)	.3757 (.294)	-.1388 (.251)	.1767 (.303)
FP_{C}	-.0014 (.003)	.0021 (.002)	.0003 (.002)	-.0017 (.003)	-.0003 (.002)
POP	.0061^{b} (.003)	.0069^{b} (.002)	.0051^{b} (.002)	.0081^{a} (.003)	.0058^{b} (.002)
GDP	.0002 (.001)	.0019^{c} (.002)	.0006 (.001)	.0002 (.001)	.0008 (.001)
SC_5_{C}	.0034 (.005)	.0055 (.004)	.0126^{b} (.006)	.0072 (.006)	.0076 (.005)
HE_1	.0251^{c} (.014)				
HE_2		-.0354^{a} (.008)			
HE_3			-.0416^{b} (.020)		
HE_4				-0196 (.029)	
HE_5					-.0252 (.019)
SC_5_{C}*FP_{C}	.0004 (.001)	.0002 (.001)	.0001 (.001)	.0001 (.001)	-.0003 (.001)
R^2	0.191	0.272	0.306	0.170	0.213
p(F)	0.097	0.007	0.027	0.189	0.145

Notes: Robust standard errors are reported in parenthesis. The superscripts (a), (b) and (c) denote 1%, 5% and 10% significance levels, respectively. According to Durbin-Wu-Hausman (DWH) test results, there is no endogeneity problem in all models.

In order to gain a deeper understanding of the interaction between fiscal policy and social capital, we also calculate margins for each model with significant interaction term. The average marginal effects are obtained by computing the slopes of the *SI* on the *FP* by holding the *SC* pillar and *SC* elements constant at different combinations of index values. In the dataset, minimum and maximum values of *SC* are 23.6368 and 77.49095, while the *SC* elements range from .8154 to 18.40289. Accordingly, we define constant values of *SC* running from 25 to 80 with five-point intervals. Along with the values between 0 and 20, the same specification is implemented for *SC* elements with two-point intervals. Table 5 presents the average marginal effects of fiscal policy on pandemic spread with different levels of social capital. Firstly, in Table 5, we observe from the model (1B) that the reducing effect of fiscal policy measures arises from the relatively high social capital levels. More specifically, it is seen that one-point increase in *FP* results in .0029 and .0068 decrease in *SI* when the *SC* has the values 75 and 80, respectively. Model (1B) also reveals that the *FP* loses its effectiveness at the relatively low values of *SC*. In models (1C) and (5D), the higher the level of civic and social participation, the better the outcome of *FP* towards pandemic spread. In regard to results of model (4C), (2G), (3G), (4G) and (5G), average marginal effects of *FP* are positively associated with *SI* in low and medium scores to *SC_4*, while strong personal and family relationship turn the effect of fiscal policy measures to significantly negative.

Table 5 Average Marginal Effects of Fiscal Policy on Pandemic Spread with Different Levels of Social Capital

Model (1B)			**Model (1C)**			**Model (4C)**			**Model (5D)**		
SC Level	**∂SI/∂FP**	**Std. Err.**	**SC_1 Level**	**∂SI/∂FP**	**Std. Err.**	**SC_4 Level**	**∂SI/∂FP**	**Std. Err.**	**SC_1 Level**	**∂SI/∂FP**	**Std. Err.**
25	.014^{c}	.008	0	.011^{c}	.006	0	.039^{a}	.013	0	.009	.006
30	.012^{c}	.007	2	.008^{c}	.005	2	.034^{a}	.011	2	.007	.005
35	.010	.006	4	.006	.004	4	.029^{a}	.010	4	.005	.004
40	.008	.005	6	.004	.003	6	.024^{a}	.008	6	.002	.003
45	.006	.004	8	.001	.002	8	.019^{a}	.007	8	-.000	.002
50	.004	.003	10	-.001	.002	10	.014^{a}	.005	10	-.002	.002
55	.002	.002	12	-.003	.003	12	.009^{b}	.004	12	-.005	.003
60	-.000	.002	14	-.005	.004	14	.005^{c}	.003	14	-.007^{c}	.004
65	-.002	.002	16	-.008^{c}	.005	16	-.000	.002	16	-.009^{c}	.005
70	-.004	.003	18	-.010^{c}	.006	18	-.005^{c}	.003	18	-.011^{b}	.006
75	-.006^{c}	.004	20	-.012^{c}	.007	20	-.010^{b}	.004	20	-.014^{b}	.007
80	-.009^{c}	.005									
Model (2G)			**Model (3G)**			**Model (4G)**			**Model (5G)**		
SC_4 Level	**∂SI/∂FP**	**Std. Err.**	**SC_4 Level**	**∂SI/∂FP**	**Std. Err.**	**SC_4 Level**	**∂SI/∂FP**	**Std. Err.**	**SC_4 Level**	**∂SI/∂FP**	**Std. Err.**
0	.033^{a}	.010	0	.033^{c}	.017	0	.035^{c}	.019	0	.038^{b}	.016
2	.029^{a}	.009	2	.028^{c}	.015	2	.030^{c}	.016	2	.033^{b}	.014
4	.025^{a}	.008	4	.024^{c}	.013	4	.026^{c}	.014	4	.028^{b}	.012
6	.021^{a}	.006	6	.020^{c}	.011	6	.021^{c}	.012	6	.023^{b}	.010
8	.017^{a}	.005	8	.016^{c}	.009	8	.016^{c}	.009	8	.018^{b}	.008
10	.013^{a}	.004	10	.011^{c}	.007	10	.011	.007	10	.013^{b}	.006
12	.009^{a}	.003	12	.007	.005	12	.006	.005	12	.008^{c}	.004
14	.005^{b}	.002	14	.003	.003	14	.001	.004	14	.003	.003
16	.001	.002	16	-.001	.002	16	-.003	.003	16	-.002	.003
18	-.003	.003	18	-.006^{c}	.003	18	-.008^{c}	.005	18	-.007^{c}	.004
20	-.007	.005	20	-.010^{b}	.005	20	-.013^{c}	.007	20	-.012^{b}	.005

Note: Robust standard errors are obtained by delta method which approximates the standard errors of transformations using a first-order Taylor approximation. The superscripts (a), (b) and (c) denote 1%, 5% and 10% significance levels, respectively.

An illustration of marginal effects is given in Figure 2. Accordingly, negative slopes for each level of *SC* pillar and *SC* elements summarize the moderating effect of social capital on fiscal policy responses to COVID-19. When the plots are compared, it is deduced that the lower and upper bound of confidence intervals for negative marginal effects are relatively narrow in models (4C), (2G), (3G), (4G) and (5G).

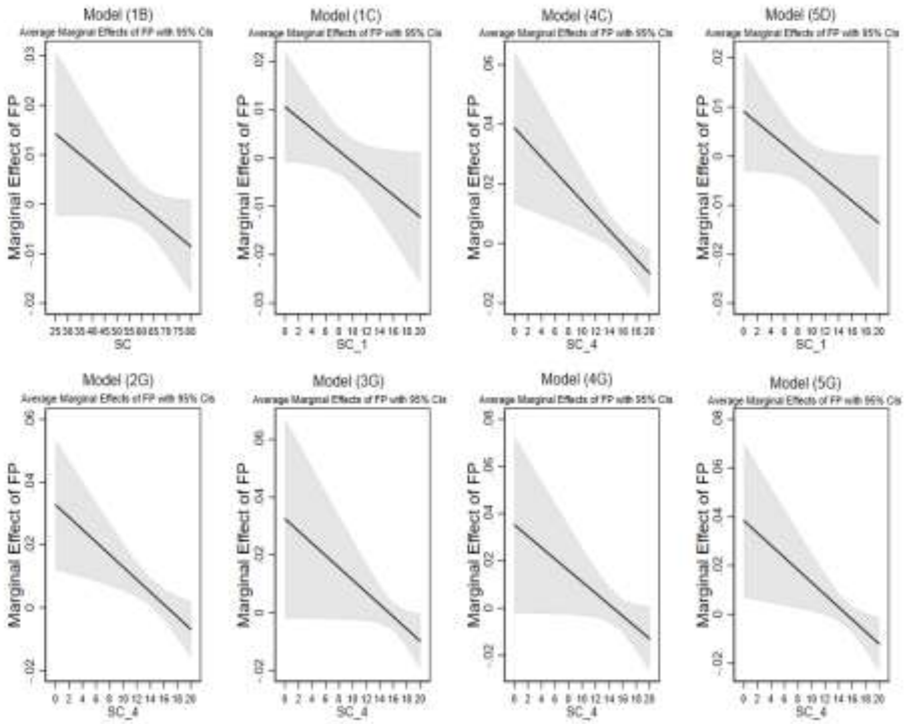

Figure 2 Marginal Effects Plot

6.Concluding Remarks

Contrary to mainstream economics based on rationality and selfishness, an individual cannot be considered separately from the socioeconomic context in which s/he lives. An individual who is a member of a society also exhibits cooperative, voluntary or solidarist behaviours appertaining to particular norms, social networks and trust. This study aims to provide a social capital-based contribution to current debates on recent economic measures taken against the pandemic. Our empirical findings show that both individual and community level social capital are significant moderating factors in preventing the transmission of the virus as a whole. This is particularly evident in individual relations and family ties, as well civic and social participation. Integrative structures such as family, friend groups, communities and foundations can act as a self-control mechanism in the event of an outbreak. Accordingly, social norms, traditions and customs have various regulatory functions on individual behaviours. Social capital is also an important element that strengthens collectivity. The information transmission resulting from civic and social participation supports collective actions against ordinary or extraordinary events. In this regard, a high level of social capital can play a decisive role in building effective public policies via social cohesion and consensus. Strong social structures may contribute to the pursuit of public interest towards public health. On the other hand, the frequency of physical interactions in the public sphere is likely to cause undesired results.

The recent catastrophe has shown again how vulnerable human beings are in the struggle for life. Many people suffer from deficiencies in healthcare systems and insufficiency of precautionary interventions. Inadequate healthcare equipment, particularly the number of intensive care beds, respirators and medical masks, has revealed how unprepared countries are for such a crisis. By virtue of its strategic importance, it is possible to say the functioning of the health sector is problematic within the logic of a pure market mechanism. Besides all the measures taken, social capital is an essential part of preparatory conditions against the worst scenarios. Governments should promote a higher level of social capital by providing a suitable environment in society. This may perhaps lead to a revision of the often-neglected social aspects of human factor in actions enabled by public policy.

In the study, more inclusive results could be arrived at, if the data comprised a longer period. In line with the proposed findings, it can also be investigated whether it would be more appropriate to deal with the same data for both developed and developing countries, separately.

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Appendix

Table 1A The List of Countries included in the Analysis

Afghanistan	Croatia	Hungary	Mali	Serbia
Albania	Cyprus	Iceland	Malta	Singapore
Argentina	Czechia	India	Mauritania	Slovakia
Australia	Denmark	Indonesia	Mexico	Slovenia
Austria	Dominican Republic	Iran	Montenegro	South Africa
Azerbaijan	Egypt	Iraq	Morocco	South Korea
Bahrain	Equatorial Guinea	Ireland	Netherlands	Spain
Bangladesh	Estonia	Israel	New Zealand	Sweden
Belarus	Eswatini	Italy	North Macedonia	Switzerland
Belgium	Finland	Jamaica	Norway	Thailand
Bosnia and Herzegovina	France	Japan	Panama	Trinidad and Tobago
Brazil	Gabon	Kazakhstan	Paraguay	Tunisia
Bulgaria	Georgia	Kyrgyzstan	Peru	Turkey
Burundi	Germany	Latvia	Poland	United Arab Emirates
Cabo Verde	Greece	Lebanon	Portugal	United Kingdom
Canada	Guatemala	Lithuania	Qatar	United States
Chile	Haiti	Luxembourg	Romania	Uruguay
Colombia	Honduras	Malawi	Russia	Uzbekistan
Costa Rica	Hong Kong	Malaysia	Saudi Arabia	

Table 2A Descriptive Statistics

Variables	Mean	Std. Dev.	Min.	Max.
SI	.1214	.1586	.0055	1.001
FP	6.1579	5.9298	.01	31.7
SC	53.4068	10.4159	23.6368	77.4909
SC_1	7.0153	3.2112	.8154	16.7847
SC_2	10.3437	3.2886	4.6583	18.4028
SC_3	7.9693	3.0356	3.6592	16.0888
SC_4	14.6862	2.8713	4.2770	18.2684
SC_5	13.3921	2.4968	2.3508	16.3620
HE	73.8243	8.7028	45.6195	86.6313
HE_1	5.6609	1.3319	2.4558	8.5270
HE_2	9.3601	2.2867	3.7315	13.2204
HE_3	12.4633	1.8378	3.8696	14.3674
HE_4	6.8730	.9566	4.4483	8.7949
HE_5	14.1622	2.0613	5.1944	17.6402
POP	48.1383	7.9500	24.9460	71.7176
GDP	28.1834	21.2717	.6348	116.0137