

Science, Technology and Innovation Studies

Mustafa Polat
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COVID-19 and Society

Socio-Economic Perspectives
on the Impact, Implications, and
Challenges

 Springer

Science, Technology and Innovation Studies

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Mustafa Polat • Serhat Burmaoglu • Ozcan Saritas
Editors


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Implications, and Challenges




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ISSN 2570-1509

ISSN 2570-1517 (electronic)

Science, Technology and Innovation Studies

ISBN 978-3-031-13141-7

ISBN 978-3-031-13142-4 (eBook)

<https://doi.org/10.1007/978-3-031-13142-4>

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This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Acknowledgements

Prof. Ozcan Saritas' contribution in this book is based on the study funded by the Basic Research Program of the HSE University.

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Abbreviations

Terms

AE	Advanced economies
AI	Artificial intelligence
AR	Augmented reality
B2C	Business to consumer
BLC	Behavioral life cycle
CARES	Coronavirus Aid, Relief, and Economic Security Act
CT	Computed tomography
DC	Developed countries
EC	European Commission
ECB	European Central Bank
EMDE	Emerging markets and developing economies
EU	European Union
FED	Federal Reserve
GDP	Gross domestic product
GFC	Global financial crisis
GVC	Global value chains
HAI	Hospital-acquired infection
HPC	High performance computing
ICT	Information and communication technology
ICU	Intensive care unit
iFORA	Intelligent Foresight Analytics System (HSE)
ILO	International Labour Organization
IMF	International Monetary Fund
IoT	Internet of things
ITI	Information technology industries
MERS	Middle East respiratory syndrome
OECD	Organisation for Economic Co-operation and Development
PEPP	Pandemic Emergency Purchase Program
PPE	Personal protective equipment

QE	Quantitative easing
R&D	Research and development
RLI	Remote Labor Index
SARS	Severe acute respiratory syndrome
S&T	Science and technology
SDG	Sustainable development growth
SME	Small and medium entrepreneurs
SMEs	Small and medium-sized enterprises
STEEPV	Social, technological, economic, environmental, political, and value
STI	Science, technology, and innovation
SUTD	Singapore University Technology and Design
TUIK	Turkey Statistical Institute
USA	United States of America
UK	United Kingdom
UN	United Nations
UNDP	United Nations Development Programme
UNCTAD	United Nations Conference on Trade and Development
UNWTO	United Nations World Tourism Organization
USA	United States of America
VR	Virtual reality
WB	World Bank
WHO	World Health Organization
WTO	World Trade Organization
WTTC	World Travel and Tourism Council
ZLB	Zero lower bound

Institutions

FCC	The Federal Communications Commission
GPHIN	Canadian Global Public Health Intelligence Network
HSE	National Research University Higher School of Economics (Moscow)
IKC	İzmir Kâtip Çelebi University, Turkey
IKCU	Izmir Katip Celebi University, Turkey
IZTU	Izmir Tınaztepe University, Turkey
ISSEK	Institute for Statistical Studies and Economics of Knowledge, HSE University
OECD	The Organisation for Economic Co-operation and Development
OPSI	Observatory for Public Sector Innovation
PHAC	Public Health Agency of Canada
US CBO	United States Congressional Budget Office

Part I
Introduction

Socio-economic Perspectives of COVID-19



Mustafa Polat, Ozcan Saritas, and Serhat Burmaoglu

1 Introduction

Throughout history, humanity has struggled with epidemics and pandemics due to the spread of infectious diseases. Infectious diseases like plague, cholera, smallpox, and influenza caused the mass death of people. They caused human deaths and great economic destruction. The impacts went far and beyond, also affecting the socio-economic, political, scientific, cultural, and military structures of societies, destruction of empires, changing borders, and broken armies, among many other impacts.

Since 2002, it was possible to detect the footprints of COVID-19. The first epidemic of the twenty-first century and the coronavirus family was the SARS (SARS-CoV) virus, which was seen in Hong Kong in 2002. The virus quickly spread to 37 countries, especially in Asia and Canada. As a result of the epidemic, 8422 cases were seen worldwide, and the virus caused the death of 916 people. The effect of the epidemic was restricted by the quarantine and isolation measures taken in the early period. The epidemic has caused a 40 billion USD income loss, while

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global growth was down 0.1%. Similarly, in 2003, the bird flu in Hong Kong led to the death of 109 people.

The World Health Organization (WHO) recognized COVID-19 first on January 12, 2020, announcing that it is a new type of coronavirus (2019-nCoV). Since then, the COVID-19 pandemic has been one of the most decisive crises of the twenty-first century, spreading across all continents inhabited by humanity. Today's pandemic not only killed people and paralyzed countries' health systems but also threatened life altogether, affecting all world societies. The COVID-19 outbreak can be defined as a threat that the twenty-first-century generation has not experienced before and has a global impact that affects our lives in all aspects. Considering the depth of the results and systemic effects, the pandemic can be considered a health concern and a critical socio-economic crisis. The pandemic has disrupted the lives of billions of people and put the global economy at risk. The pandemic and its consequences have shaken every individual and society it touches, left deep and long-lasting scars on countries, and created devastating sociological, economic, and political effects. It also has significant social effects on human and social psychology, work and family life, economic and trade capacities of countries, supply chains, business life, and the integration of education with technology. In combating these risks based on protecting all social areas of life, individuals, organizations, and societies have been transformed, habits have changed, and significant differences in societies emerged regarding accessing health, social, and economic services.

The impact of the pandemics depends on many factors such as:

- The epidemiological features (transmission mode, incubation period, infectious period, immune rate of society)
- The biological features of an infectious agent (infectivity, virulence, pathogenicity)
- The socio-demographic features (characteristics of setting amid patients and healthy people, risk density and duration of contact) and some other factors such as immune level of the society, the living habits of individuals, socio-economic situations of individuals, individuals' in-country and out-of-country travel situations, risk factors that individuals carry in their daily and work life, the quality of health services in the country where individuals live

It is possible to overcome such disruptive events that most affect the international system, such as the pandemic, only possible with strong preparation and proactive behavior. The most effective way to do this is to prepare in advance, anticipate and get ready for the most sensitive areas by applying risk management, and in case of risk realization, to develop a common mind about solving the problem with an interdisciplinary approach taking into account all the possibilities with a focus on systemic solutions. The long-lasting pandemic process worldwide may affect and worsen the fight against secondary national or international problems/crises/conflicts and other natural events that countries may face in this process. Therefore, it is important to make proactive and preventive studies on the situations that may be triggered by the pandemic. It would be wrong to think that the problems experienced in supply chains, the increase in oil prices, and the rise in inflation worldwide have

come together after the pandemic by mere coincidence. At the end of the pandemic, the succession effects that will occur in the economic dimension are becoming more and more visible. It can be stated that the measures to be taken in an economic sense will be important in the post-epidemic and epidemic periods. In the next process, it is possible to say that the firms' supply chain preference will be more effective in international relations than past. For this reason, success in the economic dimension will depend on cooperation in international relations.

During the COVID-19 pandemic, companies, consultants, leading strategic think tanks, transnational organizations, and opinion leaders of world societies focused on the socio-economic effects of the crisis and what measures may be taken in the subsequent normalization process. As of April 10, 2022, the number of COVID-19 confirmed cases worldwide is over 500 million, and the death toll is over 6.2 million, as reported by WHO (2022a). In this process, various virus mutations appeared, which was reflected in the increase in the number of cases and deaths. It is evident that if the effects of the crisis in this context are addressed from a single scientific point of view, it will not be sufficient to solve such a series of multidimensional problems. Since the beginning of the pandemic crisis, individual, institutional, and social efforts to identify and solve the problem with an interdisciplinary approach have continued.

Despite all the measures taken around the world and all the preparations made; the COVID-19 virus has spread all over the world. All commercial and social developments brought by the global world and international permeability have had opposite effects in the COVID-19 pandemic and have been the most important factor in increasing the spread of the virus. In this process, world societies have benefited from previous pandemics' applications and processes in preparation. Today's world and societies are better at diagnosing and treating pandemics and infections than before. Therefore, successes in vaccine and drug studies have developed at a breathtaking pace. By sharing the information obtained in the fight against the pandemic with the correct and appropriate intensity, rapid action has been taken worldwide, and thus it has become possible to overcome the problem.

Since the pandemic affects the entire world in all areas, it will be important to include experts representing the entire world and areas of science in the policies and strategies that will be produced for the solution. Acting with a single country or a single scientific discipline will not bring success in fighting large-scale crises such as pandemics. The solution to the problem requires both interdisciplinary and international cooperation. Establishing a common attitude and rapid response mechanism against such crises is important. People from different areas of expertise can collectively define the problem within the framework of their expertise and knowledge, within the framework of a defined task, determine solution alternatives and develop a solution proposal and follow the results and effects. In this context, it can be seen that decisive steps have been taken regarding various cooperation in the world. The Access to COVID-19 Tools (ACT) Accelerator may be defined as a good example. ACT Accelerator is a global collaboration to speed up the development, production, and equitable access to COVID-19 tests, vaccines, and treatments. COVAX is co-led by Coalition for Epidemic Preparedness Innovations (CEPI) and WHO. The

program has two main purposes. One is to speed the development and manufacture of COVID-19 vaccines, and the other is to guarantee fair and equitable access for every country in the world (WHO, 2022b).

The process of combating the virus is the fight of the common mind of the world against nature. Therefore, the right path that humanity will follow today, which has been able to survive by overcoming nature to date, is to establish common mind mechanisms and create a sustainable world. It is easier and less costly today to create a common mind using Information-Communication Technologies than ever.

In the management of the pandemic crisis, in addition to the presence of experts from the field of medicine in decision mechanisms, the presence of psychology, sociology, economics, history, management, econometrics and statistics, large data, production and industrial engineering, crisis and risk management experts also will affect the process positively. It is assessed that it will be useful to establish cross-functional teams formed by experts of the abovementioned types in overcoming the crisis. Therefore, it is important to include people with the right areas of expertise who can work in difficult conditions and areas that require cooperation in the "solution team." It has been observed that these cross-functional teams operate effectively in taking protective measures against the virus nationally. However, it has not been possible for global cross-functional teams and nations to come together to produce effective results in the field of vaccine and treatment development globally, apart from COVAX. Effective results will be achieved if national and company-based commercial concerns are left aside to a certain extent and directed toward global and social well-being.

The pandemic threatens the preservation of international peace and security, potentially causing social unrest that would greatly undermine the world's ability to fight the disease. It can be seen that the return of this unrest to problems and maybe to violence will not be far away. An erosion of trust in public institutions could begin if people perceive that state authorities are insufficient to combat the pandemic crisis or are not conducting the process transparently. Furthermore, while the economic effects of the pandemic can create "major stressors," for example, in fragile societies or less developed countries, the ensuing economic instability could have devastating consequences for women who make up the majority in the worst-affected sectors (UNWOMEN, 2021). As a matter of fact, when we consider the events in today's world, we can see important clues that all these determinations have come true.

The rapid and unprecedented spread of COVID-19 has overshadowed other crises in size and scope. The managerial analogy of best summarizing the process is VUCA. VUCA is an acronym for variability, uncertainty, complexity, and ambiguity, first used in 1987 and based on Bennis and Nanus' leadership theories (USAWC, 2021). The VUCA environment requires struggle with important problems for all organizations and leaders. With the VUCA environment, the COVID-19 crisis has deepened the situation in which organizations and leaders struggle. In this period, companies and leaders faced many dilemmas and contradictory demands.

In the VUCA environment, the development of all countries depends on industrialization and increased trade. The current crisis forces all the ways of doing

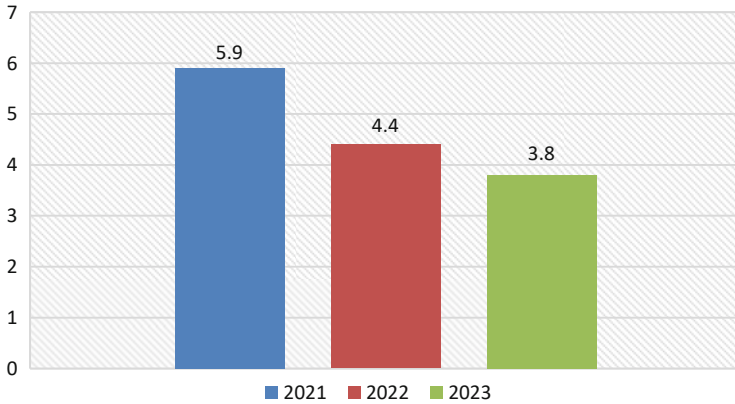


Fig. 1 World Growth Projections as percentage (IMF, 2022)

business in the countries to cope with the new crisis. In this context, all states and companies had to review their competitive strategies to meet the changing expectations of all their stakeholders in the COVID-19 environment. At the same time, they had to rethink their new business models and ways of doing business.

The COVID-19 pandemic is different from its predecessors and requires different measures. In particular, taking the right measures at the right time and determining the right policies will make this management process successful. In this process, workers affected by the virus remained at home and received treatment, and factories and workplaces had a break to their activities as a result of measures taken by countries and so global supply chains have been broken. All sectors have experienced “supply shocks” as a result of breaking global supply chains, which required different financial and economic policies to be followed than before. The reduction of supply caused economies and enterprises to shrink and increased unemployment. In addition, during the COVID-19 crisis, small- and medium-sized enterprises, the self-employed, and the informal sectors were more vulnerable and were the sectors most affected by the crises. From this perspective, it can be said that COVID-19 has created negative impacts on all employees, businesses, consumers, sectors, and states in relation to traditional economic activities. Determining the steps to be taken by creating the pandemic management process on the appropriate basis in this framework is a critical consideration. In this context, when the growth forecasts of the IMF in the world are examined (see Fig. 1), it can be seen how the economic situation after the pandemic has been adversely affected worldwide.

Faced with problems in many fields, especially in economics, humanity has had to realize the biggest global problem-solving activity of the twenty-first century. In this problem-solving process, sustainable solutions can be seen as appropriate and be used to reduce these adverse effects. Right at this point the editors started to design the present book with the question of: “*What are the effects of the virus on society?*” During the pandemic, it was observed some sectors that effects occurred intensively. It is obvious that the most basic effects of the pandemics are in social, economic, and

financial areas. In the design process, editors tried to concentrate the formation of the chapters of the book in these areas.

The second question that was sought to answer was that “*What can we learn from the virus and the pandemic?*”. In the process of the pandemic, governmental, social, organizational, and individual measures should be taken in a wide array of areas, including medical, electronics, education, individual life, family, businesses and other organizations, community, state, international relations, management, strategy, international organizations, supply chains, law, sociology, psychology, communication, supply chains, electronic commerce, finance, technology, business culture, and non-governmental organizations. The virus has taught us that we live in a world of complex and highly interconnected systems which require equal attention. Fundamentally, more investments in nature, health and healthy living, improvement of the logistics sector, the emergence of new ways of doing business, and the need to overcome important global problems with worldwide cooperation can be expressed as the first areas of concern with the all other concerns mentioned above coming onto the agenda of policymakers shortly.

The most basic and third question sought in the book is “*What happens next?*”. The virus is extremely instructive and is a subject that needs to be taken lessons from. It can also be stated that it is rare to observe another event in which learning to solve a problem has such a large-scale effect. Apart from the world wars, a similar situation occurred about 100 years ago. A pandemic is a special consideration in this sense. So, we can note that the virus stands before us as an instructive phenomenon regarding its effects. In this process, the most important condition to deal with social, psychological, political, and economic losses with the least damage is the national and international community’s common efforts to solve this problem through common sense and solidarity. Therefore, international cooperation, solidarity, common sense, and universal values, which are free from commercial and political concerns, are more vital than ever (TUBA, 2020). The predictive roles of organizations such as the WHO in the pandemic processes and their effective measures will be critical in reducing losses globally. Especially in the fight against COVID-19, the global development of vaccines, tests, and drugs and effective measures for fair access played an important role in the success of the WHO. In this process, developing new processes and methods in global company-state cooperation is one of the issues that can ensure success. It is evaluated that success, which will be brought by the state-company cooperation process going beyond national borders, maybe at the center of the solution in the present and future crises.

One of the two main factors in fighting the pandemic is that the lessons from the epidemic contribute to taking proactive measures to prevent subsequent crises, while the other is social resilience, endurance, patience, and discipline in maintaining the social struggle. The common goal of all editors and authors of the book is to present an intellectual product at a universal level to contribute to social resilience by addressing the subject from an interdisciplinary point of view. The book is designed to provide academic support for this quest and is a collective work that addresses the issues of the COVID-19 pandemic, its effects, and the measures and solutions taken in the subsequent process from different disciplines.

The present book, entitled “COVID-19 and Society: Socio-Economic Perspectives on the Impact, Implications, and Challenges,” consists of three parts and fourteen chapters. These aim to discuss the impacts of the COVID-19 from a broader perspective by considering its different aspects, which were discussed above.

The *first part of the book* focuses on the “Economic, Marketing and Financial Impacts” and covers five chapters.

- The first chapter in this part by *Yağcıbaşı and Yıldırım* discusses the macroeconomic policy in the time of COVID-19 crisis and examines the current macroeconomic policy repercussions of COVID-19 outbreak on economic policies for both developed and developing countries.
- In the second chapter, *Çelik* focuses on the socio-economic impacts of uncertainties caused by the COVID-19 pandemic due to disruptions of the production chains and distribution relations.
- In the third chapter, *Güzgü* examines the degrowth theory after COVID-19 with a particular focus on America’s healthcare services and China’s environmental policies. Degrowth theory, which is an alternative for the economy, is considered to assure human well-being while decreasing consumption and production to a sustainable level.
- The fourth chapter by *Kırkpınar and Köroğlu* focuses on the effects of psychological characteristics on financial behavior during COVID-19. The chapter argues that financial behavior is influenced by psychological constructs such as optimism and their preference for deliberation.
- The fifth chapter by *Belousova, Chichkanov, Krayushkina, and Miles* discusses the service economy in the wake of COVID-19. The chapter explores the implications of what is termed as “coronacrisis” for what has become known as the “service economy,” or more broadly “post-industrial society.”

The *second part of the book* considers the “Science, Technology, and Innovation Impacts of COVID-19.” There are four chapters in this part of the book.

- In the sixth chapter, *Satoğlu* focuses on global businesses in the wake of the pandemic. They argue that the outbreak of the coronavirus has caused rapid deterioration of the future prospects for the global economy particularly on the production and supply chain linkages.
- In the seventh chapter, *Ünal, Nardalı, Erkan, and Önemli* discuss how the COVID-19 pandemic brings our new consumer types. The chapter provides a meta-analysis of academic papers and reports directed by experts during the COVID-19 pandemic to define consumers’ patterns and highlight some assumptions about future markets’ features.
- The eighth chapter by *Privorotskaya, Vishnevskiy, and Shcherbakov* presents the shifts in the implementation of the digital technologies during the pandemic with the case of Russia. The chapter argues that the pandemic has heightened the need for digital technologies and, in some cases, made them the basic necessity.

- The ninth chapter by Kıdak and Özdemir-Güngör examines the role of robots in supporting healthcare staff in the fight against pandemics. The chapter presents the areas where medical robots are in use.

The *third part of the book* discusses the “Social and Policy Impacts” of COVID-19. There are a total of four chapters in this part.

- The tenth chapter by Akın and Yıldırım focuses on the impacts of the pandemic on cities with a particular focus on city image and sustainability.
- In the eleventh chapter, Kömürcü, Sarıbaş, and Güler discuss the impacts of COVID-19 on the tourism industry. The chapter focuses on the factors affecting the tourism sector as one of the drivers of economic development.
- The twelfth chapter by Demirtaş-Milz considers the transforming context of global economy and mobility regimes. In particular, the chapter presents forecasts about the migrant positions in the light of the COVID-19 pandemic with the case of Italy and China.
- The thirteenth chapter of the book by Gershman, Gokhberg, and Kuznetsova discusses the Science, Technology and Innovation (STI) policy in response to the COVID-19 crisis. This chapter analyzes the current trends in STI policy worldwide and in Russia, including the immediate actions of national governments to support the STI sphere during the crisis.
- Finally, the fourteenth chapter by Kandemir examines the COVID-19 measures adopted by the Provisional Article 13 of the Turkish Commercial Code with a focus on the limitation of companies’ dividend distribution decisions. The chapter gives a background on the legal measures introduced to reduce the damage of the pandemic.

As the editors of this book, we would like to acknowledge that we have not encountered any problems which can be encountered in the process of conducting editorial and multi-author projects, such as the present book, in this book study. One of the main reasons for this is the meticulous and selfless work of the contributing authors from the beginning to the end of the book. Another reason is the unification of the idea of effective and efficient use of time at home with experiencing social limitation and isolation process during the writing period. The reason that makes the work different can be expressed by the fact that people who have experienced this crisis that has led to significant fractures in the world have reflected written their own experience and knowledge contributions during this period. We hope that the work will be useful to the entire academy, society, and policymakers. Finally, as the editors, we would like to express our condolences to the people who have lost their lives due to the COVID-19 pandemic and wish strength to their families and the entire humanity.

Acknowledgments Prof. Ozcan Saritas’ contribution in this chapter was within the framework of the Basic Research Program of the HSE University.

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Part II
Economic, Marketing, and Financial
Impacts

Macroeconomic Policy in the time of COVID-19 Crisis: Facts, Pitfalls, and Limitations



Özge Filiz Yağcıbaşı and M. Ozan Yıldırım

1 Introduction

COVID-19 has first emerged as a local health crisis. But it has rapidly spread and achieved global status. It is not the first disease shock that the world has experienced. Black Death (1347–1352), Global Flu (1889–1890), and Spanish Flu (1918–1920) are only some examples (Jordà et al., 2020). However, no other pandemic has spread in such a short time and so quickly that very strict measures are required. It took only four months for a local disease to disperse around the world. The spread of the pandemic in such a short time is undoubtedly related to the globalization concept and the development of transportation technologies that accelerated after the 1990s. In addition to forming the backbone of globalization, international trade also acts as an accelerator in the spread of infectious diseases through the delivery, product, and people involved in the process (Barua, 2020).

As of January, 30, 2021, COVID-19 is present in 221 countries with over 100 million infected people and more than 2.2 million deaths. The center of the epidemic has shifted from China to Europe and then to the American continent. Figure 1 reports the number of total COVID-19 cases in the top 30 countries. The top five countries in the total number of cases are the USA, India, Brazil, Russia, and the UK, respectively. The common characteristics of these countries may be that they are reluctant to take adequate measures at the beginning of the epidemic.

Cases of infection and threats regarding the disease are still rising in countries such as the USA, India, Brazil, Russia, UK, France, Spain, Italy, Turkey, Mexico,

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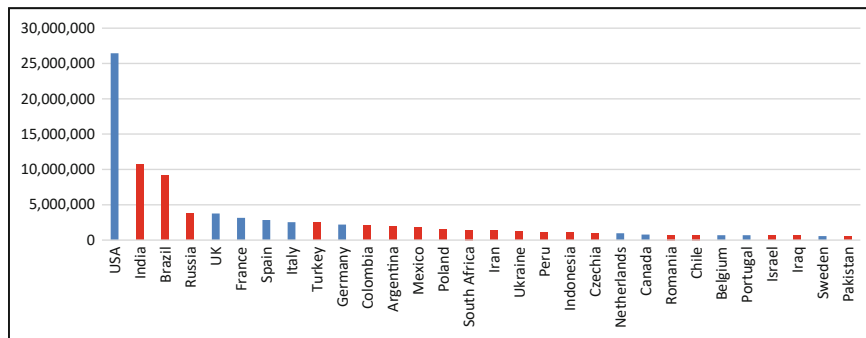


Fig. 1 Number of COVID-19 reported cases in the top 30 countries. Source: Authors calculate this figure by using worldometers website retrieved on 30 January 2021

Indonesia, and Portugal. As of January, 30, 2021, there are 19 developing countries in the top 30 countries with the highest number of reported coronavirus cases. Many countries like the UK, Spain, Italy, Germany, Turkey, France, Canada, China, Belgium, and Netherlands have tried to take control of the pandemics. However, total relaxation is not possible for any country without a widespread vaccination or definitive treatment. Indeed, after observing a rise in the number of cases, China started to take new quarantine measures with the fear of a second wave. At the time of writing, there has been a stronger second wave in many countries since the Fall of 2020.

Unfortunately, it is clear that the death toll caused by this epidemic is much more painful and terrible than the economic consequences of the COVID-19 outbreak that it creates. However, the current pandemic crisis brings with it many structural changes and transformation in the functioning, conceptualization, and analysis of the economic policies. It is difficult, if not impossible, to predict the magnitude and impact of the economic consequences of the COVID-19 crisis as it is historically the rare health and economic crisis the world has experienced (Orlowski & The, 2020). This current situation also leads to the definition of the COVID-19 outbreak as an unexpected negative shock for both global economy and individual countries (Karabag, 2020). On the one hand, the danger of human life with the spread of the virus, and on the other hand, a high uncertainty limit the success of the economic policy against the crisis. Nonetheless, effectively conducting an economic policy in order to mitigate its adverse impact on the economy is challenging, due to the large degree of uncertainty with respect to the persistence, contagiousness, and the size of the shocks arising from it.

The potential economic damage of the COVID-19 pandemic is expected to be greater than the 2008–2009 Global Financial Crisis (GFC) (Gopinath, 2020). IMF forecasts point out that before the pandemic, 165 out of 188 countries were expected to have a positive growth rate. But after the pandemic, this number has decreased to 16 out of 188 (Djankov & Panizza, 2020). As a basis for comparison, the estimated number of countries growing positively after the GFC was around 80 countries.

Table 1 Real GDP growth in economic outlooks, 2020–2022

Countries	World Bank			IMF			OECD		
	2020	2021	2022	2020	2021	2022	2020	2021	2022
World	−4.3%	4.0%	3.8%	−3.5%	5.5%	4.2%	−4.2%	4.2%	4.1%
Adv. Econ.	−5.4%	3.3	3.5	−4.9	4.3	3.1	−3.8	4.7	3.7
USA	−3.6	3.5	3.3	−3.4	5.1	2.5	−3.7	3.2	3.5
Euro Area	−7.4	3.6	4.0	−7.2	4.2	3.6	−7.5	3.6	3.3
Japan	−5.3	2.5	2.3	−5.1	3.1	2.4	−5.3	2.3	1.5
EME and DC	−2.6	5.0	4.2	−2.4	6.3	5.0	n.a.	n.a.	n.a.
China	2.0	7.9	5.2	2.3	8.1	5.6	1.8	8.0	4.9
Russia	−4.0	2.6	3.0	−3.6	3.0	3.9	−4.3	2.8	2.2
Turkey	0.5	4.5	5.0	1.2	6.0	3.5	−1.3	2.9	3.2
L. America	−6.9	3.7	2.8	−7.4	4.1	2.9	n.a.	n.a.	n.a.
Brazil	−4.5	3.0	2.5	−4.5	3.6	2.6	−6.0	2.6	2.2
Mexico	−9.0	3.7	2.6	−8.5	4.3	2.5	−9.2	3.6	3.4
Middle East	−5.0	2.1	3.1	−3.2	3.0	4.2	n.a.	n.a.	n.a.
India	−9.6	5.4	5.2	−8.0	11.5	6.8	−9.9	7.9	4.8
Sub-Sah. Afr.	−3.7	2.7	3.3	−2.6	3.2	3.9	n.a.	n.a.	n.a.
Nigeria	−4.1	1.1	1.8	−3.2	1.5	2.5	n.a.	n.a.	n.a.
S. Africa	−7.8	3.3	1.7	−7.5	2.8	1.4	−8.1	3.1	2.5

Source: World Bank, IMF, OECD

Note: EME and DC represent emerging market economies and developing countries, respectively

Global real GDP growth has slowed down by 0.1% in 2009 while the projected contraction was 3% in April 2020 due to the pandemic lockdown (IMF, 2020b). The IMF has updated its projection downward to a 4.9% reduction in global GDP. Moreover, the recovery is expected to be more gradual than previous forecasts (IMF, 2020a) due to the required reallocations in both labor and capital markets (Bénassy-Quéré & Weder di Mauro, 2020).

Table 1 shows the projected effect of the COVID-19 outbreak on selected countries' economic growth rates. Projections made by the IMF, World Bank (WB), and OECD are summarized in one table. All three institutions revised their estimates on economic growth downward under the bad scenario, as the outbreak has gained momentum. In 2020, the GDP growth rate in the world economy is expected to decrease by 3.5, 4.3, and 4.2% according to IMF, WB, and OECD, respectively. Moreover, it is expected that all economies except China and Turkey in Table 1 will contract at the end of 2020. China, where the outbreak began in December 2019, is expected to grow by around 2% according to all three projections by IMF, WB, and OECD in 2020. According to the WB and IMF forecastings, Turkey is expected to have gradual economic growth, ranging 0.5%–1.2%.

The US economy is expected to shrink by an average of 3.5% in 2020, which is about two times the contraction experienced by the Global Financial Crisis during 2008–2009. Additionally, a strong hit of the pandemic in Europe is expected to lead to the narrowing of the Euro Area by around 7% under all projections. According to

Table 2 Consumer prices, current account balance, and unemployment (Annual percent change)

	Consumer prices			Current account balance			Unemployment		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
Euro Area	1.2	0.4	0.9	2.3	2.1	2.3	7.6	8.9	9.1
United Kingdom	1.8	0.8	1.2	-4.0	-2.0	-3.8	3.8	5.4	7.4
Germany	1.3	0.5	1.1	7.1	5.8	6.8	3.1	4.3	4.2
France	1.3	0.5	0.6	-0.7	-1.9	-1.8	8.5	8.9	10.2
Italy	0.6	0.1	0.6	3.0	3.2	3.0	9.9	11.0	11.8
Spain	0.7	-0.2	0.8	2.0	0.5	0.9	14.1	16.8	16.8
Russia	4.5	3.2	3.2	3.8	1.2	1.8	4.6	5.6	5.2
Turkey	15.2	11.9	11.9	1.2	-3.7	-0.9	13.7	14.6	12.4
Ukraine	7.9	3.2	6.0	-2.7	4.3	-3.0	8.5	11.0	9.6
Japan	0.5	-0.1	0.3	3.6	2.9	3.2	2.4	3.3	2.8
Korea	0.4	0.5	0.9	3.6	3.3	3.4	3.8	4.1	4.1
Australia	1.6	0.7	1.3	0.6	1.8	-0.1	5.2	6.9	7.7
Singapore	0.6	-0.4	0.3	17.0	15.0	14.5	2.3	3.0	2.6
Hong Kong	2.9	0.3	2.4	6.2	4.4	4.7	3.0	5.2	4.4
China	2.9	2.9	2.7	1.0	1.3	0.7	3.6	3.8	3.6
Indonesia	2.8	2.1	1.6	-2.7	-1.3	-2.4	5.3	8.0	6.8
Malaysia	0.7	-1.1	2.4	3.4	0.9	1.8	3.3	4.9	3.4
Philippines	2.5	2.4	3.0	-0.1	1.6	-1.5	5.1	10.4	7.4
United States	1.8	1.5	2.8	-2.2	-2.1	-2.0	3.7	8.9	7.3
Canada	1.9	0.6	1.3	-2.0	-2.0	-2.4	5.7	9.7	7.9

Source: IMF, World Economic Outlook

the Bank of England, the UK economy will experience its deepest recession in 300 years due to COVID-19 (Monetary Policy Report, 2020, Bank of England).

Furthermore, advanced countries as a group are expected to shrink by 4–5% in 2020. Due to the base effect that emerged as a result of this severe contraction, almost all world economies are expected to enter a significant positive growth process again in 2021. According to the latest reports (World Bank, 2021; IMF, 2020c), the growth rate for emerging markets and developing economies is projected to reach 5.0 and 6.3%, respectively in 2021. Moreover, global economic growth is projected to be 4.0%, 5.5%, and 4.2% in 2021 by the WB, IMF, and OECD, respectively. That means the world output growth rate for the year 2021 is expected to exceed its pre-crisis 2019 level for many countries.

Table 2 provides consumer prices, current account balance, and unemployment for Advanced Europe, Emerging and Developing Europe, Advanced Asia, Emerging and Developing Asia, and North American countries in 2019–2021 periods (IMF, 2020b). Inflation has declined sharply owing to collapse in overall demand in many countries. However, it is expected to rise in 2021 as households increase their spending on goods and services that they had been forced to postpone consuming because of lockdowns and restrictions on movement. On the supply side, higher input costs arising as a result of the disruption in input supply may also cause

inflation to increase. The expansionary monetary policy and large budget deficits are expected to increase inflationary pressure on economy by distorting inflation expectations.

Global trade is another economic area that restrictions on movement and lock-downs have significantly affected as trade restrictions and supply chain disruptions has collapsed. Even if all countries are exposed to decline substantially in global trade, its adverse effect on economy is uneven. Economies where remittance flows and travel & tourism, and oil exports have a large share of GDP are projected to be severely affected from the pandemics (IMF, 2020b). As a result of huge contraction in real GDP, unemployment rates in almost all economies are projected to increase significantly in 2020. Following the contraction in 2020 and weak recovery in 2020, the unemployment rates are projected to prevail high level owing to negative output gaps in 2021 in several advanced and emerging market economies. The longer this crisis lasts, the higher the burden will be on government budgets, as high unemployment rates will result in higher unemployment benefits.

This paper is organized in two sections. Firstly, it analyzes the economic implications of this pandemic for the selected dimensions. It is important to understand how the health crisis has become a full-fledged economic crisis by discussing the propagation mechanisms of the COVID-19 outbreak. The study also evaluates the impact of this shock on the economic growth and labor market for many countries. Moreover, the asymmetric effects of the crisis on different sectors were also emphasized. The extent of the destruction of the pandemic on economic activity is important for the control of the epidemic and the success of the economic policy. Undoubtedly, the most important feature of the crisis is that shocks are coming from both the supply sector and the demand sector that have rarely been encountered in the economic literature.

In the second section, this paper investigates an early assessment of monetary and fiscal policies as principal economic policy. The predicted collapse in economic activities across the world is unprecedented. As a consequence, the rescue, recovery, and stimulus programs necessitate the simultaneous use of a wide range of economic policy instruments to combat the COVID-19 crisis. This paper mainly focuses on the principal economic policies: monetary policy and fiscal policy to evaluate the effectiveness of measures. However, it should be emphasized that there is no one for an all economic policy to be conducted for all economies to overcome the crisis quickly. Furthermore, the fact that no country in the world has the same economic structure and some countries' binding resource constraints (especially developing countries) should also be taken into account in the assessment of the economic policies' success.

2 Economic Implications of COVID-19 Crisis

2.1 Propagation Mechanism of the COVID-19 Crisis

COVID-19 differs from earlier disease shocks in terms of its economic consequences. Economic implications of the COVID-19 on world economies can be studied in three channels (Weder di Mauro, 2020). The first channel is purely medical shock. As a result of the contraction in the labor force due to infected workers, production has slowed down considerably. The second channel is the impact of containment measures. Most countries have shut down businesses in non-essential sectors in an attempt to reduce the infection rate. This has resulted in a major slowdown in economic activity. And finally, the third channel is the major breaks in the global value chains (GVC).

Table 3 shows the regions' GVC participation rate and top 10 exporting developing economies by GVC participation rate as of 2017. In developing countries, China (62%), as a starting point of this health crisis, is the fourth country in the highest GVC participations and has an important commercial port (World Development Report, 2019). Furthermore, China is an important supplier of textile and information and communication sector (ICT) in the world. Many industries' supply chains are heavily reliant on Chinese manufacturers across the world. Moreover, many production centers are located in developing countries led by China. Interruption in supply in East Asia's textile and ICT sectors is very likely to diminish textile and ICT sectors of other countries across the world (World Trade Organization, 2019). As a consequence, Chinese productivity slowdown has affected directly

Table 3 GVC participation rates, 2017

Region	GVC P. Rates	Top 10 exporting developing economies with highest GVC P.	Rates
Developed Economies	60	Singapore	76
European Union	65	Hong Kong	73
Developing Economies	56	Malaysia	64
East and South-East Asia	61	China	62
Africa	55	Philippines	58
Asia	59	Korea Republic	58
West Asia	50	South Africa	57
L. America and Caribbean	41	Turkey	56
Transition Economies	57	Taiwan	54
Least Developed Countries	41	Chile	53

Source: World INVESTMENT report, UNCTAD (2018)

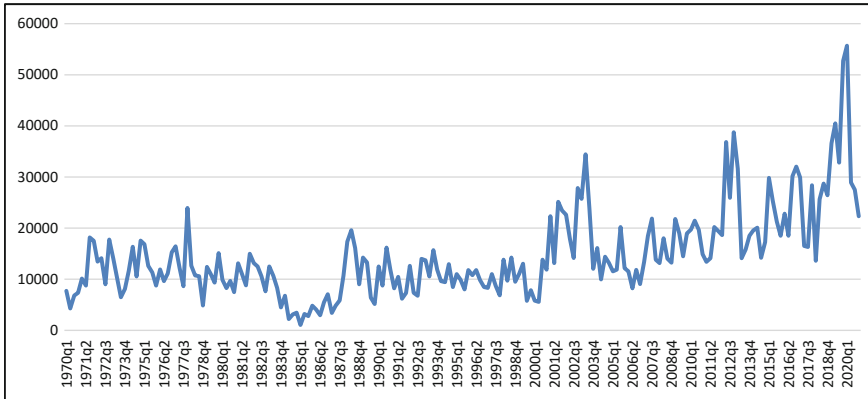


Fig. 2 World uncertainty index, 1970Q1–2020Q4. Source: <https://worlduncertaintyindex.com/>

many countries’ imported inputs. Therefore, the lockdowns in these countries not only affect the production of that country/industry but also affects all countries/industries that have forward and backward linkages. Therefore, the current economic outlook can be characterized by simultaneous negative supply and negative demand shock of unprecedented magnitude that both reduces aggregate private spending and lowers firm’s ability to produce and disruptions in supply chains generating negative spillover effects (Fernandes, 2020; Furman, 2020; Gopinath, 2020).

Another distinctive feature of this crisis is the unprecedented uncertainty created by the outbreak. Figure 2 displays the World Uncertainty Index since 1970 and demonstrates that the COVID-19 pandemic has created the highest uncertainty level in the past five decades and exceeds all economic crises since 1970 such as Oil Price Shock I and II, Asian and Latin American crises, and Global Financial Crisis (Fernandes, 2020).

The source of this unprecedented level of uncertainty can be categorized into four groups. First of all, the majority of countries have lifted or flexed containment measures. But the fear of contagion remains still. Hence, the strength of social distance motive in the coming months is still unclear. So does the recovery hopes of the services industry. The second source of uncertainty is the growing possibility of a second wave. As this scenario will bring a second lockdown policy, there is a chance that the global economy would continue shrinking before the recovery begins. Thirdly, there exists an implicit expectation regarding the invention of vaccination against the virus. But the possibility of such a cure and the required duration to commercialize it are still uncertain. Finally, following the pandemics, most central banks have extended their expansionary monetary policies to mitigate the adverse effect of COVID-19 outbreaks although they have been implementing lower interest rate policy from Global Financial Crisis (Bank of England, 2020;

Benmelech & Tzur-Ilan, 2020).¹ As one of the examples of these further measures, FED decreased 3-month Treasury bill rate from 1.5% in February down to 0.3% in March and 0.1% in April (Blanchard, 2020). FED's balance sheet has also risen from 4.1 trillion dollars in February to above 7 trillion dollars in June 2020. Regarding for euro area, the ECB's liabilities have increased from 4.6 trillion euros in February to 6.5 trillion euros in September 2020, even if there is little room to decrease interest rates further. Similarly, Bank of Japan has widened its balance sheet from 584.9 trillion yen in February to 689.9 trillion yen in September 2020 (FED, 2020). Although this is a sound policy in the short term, it has some risks in the medium and long term that we will focus on in the following sections.

In case of uncertainty, households and firms postpone their consumption and investment decisions and increase their precautionary savings. This feed amplifies other propagation mechanisms of the crisis and contributes to shrinking aggregate demand. In other words, uncertainty and the anxiety it creates can be evaluated as an additional factor that will shape the outcome of the crisis (UNCTAD, 2020). Uncertainty is also a very challenging situation for policymakers since it is difficult to decide and implement which policies to follow in the environment of uncertainty.

2.2 Sectoral Asymmetries

The adverse effects of disease shock to aggregate production for all countries are absolute. But at the same time, the degree to which different sectors are affected by the crisis also differs significantly. Due to the nature of the sector, businesses, where more people need to be together, increase the risk of spreading the virus. These sectors were closed first in containment measures and/or experienced the contraction in demand most and were deeply affected by the crisis.

del Rio-Chanona et al. (2020) measured the quantitative responses of selected industries against demand and supply shocks for the US economy. In Fig. 3, labels indicate how selected industries are affected by demand and supply shocks. Estimations regarding the vulnerability of industries against demand shocks (horizontal axis) are based on expert estimates developed by the US Congressional Budget Office (US Congressional Budget Office, 2006). Estimations regarding the vulnerability of industries against supply shocks (vertical axis) are based on Remote Labor Index (RLI). Supply shocks assumed to be effective on industries through labor supply shocks. Industries with lower RLI scores (indicating they have lower ability to work from home) more likely experience job loss or reduced work hours. Hence, these industries expected to be affected from supply shocks more heavily.

¹interest rates were already very low before the COVID-19 crisis. Yet, central banks took further measures, which are conducted both conventionally and unconventionally monetary policy (Blanchard, 2020).