Special Feature on social, economic, and spatial impacts of COVID-19 pandemic in Turkey

Tüzin Baycan¹ · Suat Tuysuz²

Received: 11 September 2022 / Accepted: 12 September 2022 / Published online: 23 September 2022
© The Japan Section of the Regional Science Association International 2022

Abstract
This Special Feature investigates the social, economic, and spatial impacts of the COVID-19 pandemic in Turkey and highlights the factors differentiating Turkey from the other countries. The articles contributing to this Special Feature are classified into three main parts. The first group of articles addresses spatial implications of the COVID-19 pandemic in Turkey with a specific focus on the place-based factors affecting the spread of the pandemic, the determinants of pandemic-induced changes in intracity mobility, and the use of social media to forecast commercial real estate figures during COVID-19. The second group of articles investigates the social and economic implications of the COVID-19 pandemic and diversely affected economic sectors in Turkey. These articles analyze the vulnerability and resilience of regions and diversely affected economic sectors with a specific focus on the housing market that displays an opposite trend to international tendencies regarding transaction volumes and private rental housing prices. The third group of articles considers the economic impact of the COVID-19 pandemic from an international perspective. These articles analyze the impact of the COVID-19 pandemic on international trade with a specific focus on exports and the fragility of the global trade structure and network in the framework of global value chains. Analyzing the impacts of COVID-19 from different perspectives, the articles in this Special Feature reveal the factors differentiating Turkey from the other countries and highlight the challenges.

Keywords COVID-19 pandemic · Social and economic implications of COVID-19 · Spatial implications of COVID-19 · COVID-19 and diversely affected economic sectors · The impact of the COVID-19 from an international perspective · Turkey

¹ Faculty of Architecture, Department of Urban and Regional Planning, İstanbul Technical University, Taşkışla Taksim, Şişli, 34437 İstanbul, Turkey

² Faculty of Arts and Science, Department of Geography, Erzincan Binali Yıldırım University, Yalnizbag, 24100 Erzincan, Turkey
1 Regional disparities and the impacts of the COVID-19 pandemic

The COVID-19 pandemic affected almost all countries and more than 50 million people around the World (OECD 2020a). Many countries faced multiple crises, such as a health crisis, a financial crisis, and a collapse in commodity prices, overlapping, and interacting in complex ways (Gopinath 2020). Nevertheless, the impacts of the COVID-19 pandemic on countries have been heterogeneous, and low-, middle-, and high-income nations were hit differently.

The COVID-19 crisis has erased the accumulation of years in the direction of reducing inequality but also led to many new opportunities, such as the acceleration of digitalization. It is highly likely possible that the world will witness potential risks and developments with the impact of COVID-19. According to the OECD report, the expenditures made by governments to struggle with the crisis will hinder access to finance, and the lack of funding detain developing countries on track for the 2030 Sustainable Development Goals (OECD 2020b). The study by Anholon et al. (2022) expressed that the pandemic gave rise to the generation of informal work and increased poverty, as well as the articulation of gender gap and public health problems. Despite some unfortunate, the crisis has also played a major accelerating role. These accelerating roles due to COVID-19 occur in numerous areas, from retail (Dannenberg et al. 2020; Hardaker 2022) to education (Cone et al. 2021; Taglietti et al. 2021), work patterns (Amankwah-Amoah 2021), social lifestyle (Ricarte 2021) and also people’s visiting behavior of museums (Fissi et al. 2022). From this point of view, the positive and negative aspects due to COVID-19 would shape our world in many ways. Undoubtedly, the crisis did not have the same effect in all regions. The impact of the crisis was mainly on the developed countries. For example, compared to GDP, the additional expenditures against the COVID-19 crisis were differentiated as 11 percent, 4 percent, and 3 percent, respectively, in the developed economies, emerging economies, and low-income countries (IMF 2021a). Although the crisis has caused extraordinary spending in developed countries, poorer countries, and disadvantaged groups have suffered the most, such as access to vaccines, and threatening disadvantaged groups’ incomes, employment, education opportunities, etc. (IMF 2022). The extra expenditures seen in developed countries to alleviate the impact of COVID-19 have increased their resilience against the crisis. The comparative figures reveal that the crisis’s impact differs spatially.

The impacts of COVID-19 in Turkey also differ from several perspectives internationally in comparison with other countries and regionally by different social, economic, and territorial dynamics within the country. From an international perspective, the most remarkable factor that differentiates Turkey from the other countries is its economic performance during the COVID-19 pandemic. Against the global economic slowdown, Turkey was among the few countries with a positive performance, and the country’s economy grew by 1.8 percent in 2020 and 11 percent in 2021, the fastest among the G20 countries (World Bank 2022). Turkey has also benefitted from the deterioration of global shipping reliability during this period; exports of goods reached record high levels in 2021.
Turkey’s share in global exports surpassed 1 percent for the first time in its history. Thanks to a delayed start of COVID-19 in Turkey and the opportunity to observe the measures implemented by other countries and put similar measures into practice quite rapidly, instead of very restrictive measures focusing on school closing, travel restrictions and age-dependent curfews, and leaving most businesses open was the major success during the first wave (Çakmaklı et al. 2021).

Turkey also differs from other countries with its new economic model. Despite tightening global monetary conditions, Turkey is the only country that reduced the policy interest rate (by 500 bps in 2021) among the emerging markets. With the reduced policy interest rate, the Turkish Lira reached record low levels, depreciating by more than 130 percent—the most depreciating currency among emerging market economies—and inflation has accelerated in 2021 with the sharp Lira depreciation, rising international commodity prices and rising inflation expectations (IMF 2022). Officially declared inflation rates reached 36 percent in December 2021, 49 percent in January 2022, and 79 percent in July 2022, the highest rate since September of 1998. This dramatic rise in inflation has been reflected in a sharp increase in transportation (119.11 percent), housing (69.96 percent), energy (129.3 percent), food and non-alcoholic beverages (94.65 percent), and furnishings and household equipment (88.35 percent) (TURKSTAT 2022). Turkey adopted policy measures during the pandemic have also generated specific vulnerabilities, such as the dollarisation of the economy, the erosion of central bank reserves, and excessive credit growth (Çakmaklı et al. 2021).

As a result, against the remarkable economic growth in 2020 and 2021, the Turkish economy, several sectors and households have been hit hard by the COVID-19 pandemic. The lockdowns and restrictions have resulted in the shutdowns of many small and medium-sized businesses, leading to lower economic output and increased unemployment. The sharp Lira depreciation and dramatic rise in inflation also hit the economy, several sectors, and households hard. Altogether, the COVID-19 associated measures and the new economic model-associated policy measures have deepened Turkey’s existing social, economic, and spatial inequalities.

This Special Feature investigates the social, economic, and spatial impacts of the COVID-19 pandemic in Turkey, analyzes the impacts of COVID-19 from different perspectives, and highlights the factors differentiating Turkey from the other countries. The articles contributing to this Special Feature are classified into three main parts: the first part addresses spatial implications of COVID-19 in Turkey, the second part examines the social and economic implications of COVID-19 and diversely affected economic sectors in Turkey, and the third part evaluates the economic impact of COVID-19 from an international perspective. The first group of articles focuses on the place-based factors affecting the spread of the pandemic, the determinants of pandemic-induced changes in intracity mobility, and the use of social media to forecast commercial real estate figures during COVID-19. The second group of articles analyzes the vulnerability and resilience of regions and diversely affected economic sectors with a specific focus on the housing market that displays an opposite trend to the international tendencies in terms of transaction volumes and private rental housing prices. The third group of articles analyzes the impact of the
COVID-19 pandemic on international trade with a specific focus on exports and the fragility of the global trade structure and network in the framework of global value chains.

2 Spatial implications of COVID-19 pandemic in Turkey

Spatial implications of the COVID-19 pandemic have been investigated from different perspectives. Some studies have analyzed geo-environmental factors (air pollution, weather conditions) (Coccia 2020), demographic characteristics (population density) (Mollato et al. 2020; Arbel et al. 2022), and climate conditions (temperature, humidity) (Oto-Peralías 2020; Ma et al. 2020; Sajadi et al. 2020; Wang et al. 2020; Wu et al. 2020; Rios and Gianmoena 2021) can affect the spread of COVID-19. Some studies have found a strong correlation between human mobility and the spread of disease (Chen et al. 2020; Furceri et al. 2020; Gross et al. 2020; Zhang et al. 2020; Hierro and Maza 2022). Other studies have revealed that urban agglomerations, including large-scale industries, companies, and industrial clusters, significantly affect the COVID-19 incidence (Curtini and Salvati 2021; Boumahdi et al. 2021). Poverty, high rate of urbanization, and lack of infrastructure are other factors that lead to increasing COVID-19 cases (Gibson and Rush 2020; Sridhar 2021).

Three contributions to this Special Feature have investigated spatial implications of the COVID-19 pandemic in Turkey. The first article addresses the place-based factors affecting the spread of the pandemic, the second article focuses on the factors that influence changes in intracity mobility for various urban functions, and the third article analyzes the use of social media to forecast commercial real estate figures during COVID-19.

The first article by Ronael and Baycan (2022) reveals the place-based factors affecting the spread of the COVID-19 Pandemic in Turkey. While addressing a set of physical, natural, economic, demographic, and mobility indicators, Ronael and Baycan analyze which factors are affecting the spread of the pandemic in 81 provinces in Turkey. The results of their analysis demonstrate that three factors: population density, annual temperature, and the number of hospitals per hundred thousand people, are affecting the spread of the pandemic; however, the impact of these factors spatially differs in the country, especially in the East–West direction.

Several changes in urban mobility patterns have been observed in response to COVID-19 as many countries, including Turkey, have imposed restrictions on community mobility to reduce disease transmission. The article by Hayrullahoğlu and Varol (2022) aims to identify the factors that influence changes in intracity mobility during the COVID-19 pandemic for various urban functions (grocery/pharmacy, residential, parks, retail/recreation, transport stations, and workplaces). Using community mobility data collected by Google and employing Artificial Neural Networks (ANN), Hayrullahoğlu and Varol analyze the dynamics that affect mobility changes for Çankaya, the Central Business District (CBD) in Ankara, where public institutions and organizations, major commercial centers, and the most heavily used transit corridors exist. Their analysis demonstrates that responses to the pandemic differed
considerably by urban function, and the impacts of the pandemic on intracity mobility decreased in the new normal era when rules were relaxed.

Addressing consumers’ changing habits and preferences during the COVID-19 by lockdowns, changing priorities, and how spending time in urban areas, Taşçılar and Arslanlı (2022) examine the use of social media to forecast commercial real estate figures in Beşiktaş district, which is the heart of commercial activity in Istanbul and determine the potential of social media data for forecasting the future rent/price levels of retail properties. Using the worldwide popular location-based social networks (LBSN) sources and Instagram and Twitter-based geo-tagged big data, they detect the footprints of millions of user check-ins and develop a forecasting method that predicts retail properties’ future rent/price levels within a specific location. Their findings reveal that the LBSN data could be used to explain the trend of demand for commercial environments within the city, considering that geo-tagging mainly occurs where people engage in commercial activities. Overall, the article highlights the explanatory power of social media data on commercial real estate trends and contributes to the literature on real estate development by being the first study to adopt LBSN data to forecast commercial property prices.

3 Social and economic implications of COVID-19 pandemic and diversely affected economic sectors in Turkey

Although the COVID-19 outbreak gave rise to an economic downturn worldwide, the spatial impact of the crisis has not been similar in all regions (Bailey et al. 2021). Local/regional dynamics that make regions resilient or vulnerable differ according to their response to economic shocks. Previous crises have demonstrated that economic structure, competitiveness, innovation tendency, workforce skills, entrepreneurial culture, institutional forms, and economic governance arrangements determine the response of the regional economy to the crises (Martin 2012). The composition of the sectoral structure in the region, sectoral diversity or specialization, and the scale of the companies are among the most critical factors that make the regions resilient or vulnerable (Sagan and Masik 2018; Klimanov et al. 2020; Kim et al. 2022). The COVID-19 pandemic has had a significant impact on several sectors. While some sectors were hit hard by unemployment, closed production, supply chain disruption, and a collapse in demand (e.g., aviation, automotive, tourism, media and culture, leisure and hospitality), some other sectors have been least impacted or even shown an outstanding performance in terms of increasing demand (e.g., housing, communication equipment, health care equipment and supplies, pharmaceuticals).

The COVID-19 pandemic has also significantly impacted several sectors in Turkey. Regional dynamics, sectoral structure, diversity and specialization, and the scale of the companies have determined the resilience and vulnerability of regions. While the regions have been economically affected at different levels, their recovery has also differed regionally, and several sectors have been diversely affected during COVID-19. Among the sectors that have been diversely affected, the housing sector is remarkable with its transaction volumes and prices. The second group of articles contributing to this Special Feature investigates the social and economic
implications of the COVID-19 pandemic in Turkey. It analyzes the vulnerability and resilience of regions and diversely affected economic sectors with a specific focus on the housing market that displays an opposite trend to international tendencies regarding transaction volumes and private rental housing prices.

Addressing the neglected regional dimension of the economic impacts of the COVID-19 outbreak, Tuysuz et al. (2022) analyze the vulnerability and resilience of regions and diversely affected economic sectors in Turkey. They first offer a great picture of resilient and vulnerable regions by developing a resilient-vulnerability index and employing Location Quotient (LQ) analysis. Next, they highlight what kinds of dynamics give rise to the resilience or vulnerability of regions. Their analysis reveals that regions are economically affected at different levels, and their recovery differs regionally. While regions having relatively larger economies recover more slowly, on the contrary, regions having smaller economies recover more quickly. Their analysis also highlights that while firm size predicts regional resilience positively, the region’s innovation capacity and export levels negatively predict regional resilience.

In the following article, Aksoy Khurami and Özdemir Sarı (2022) investigate the trends in the housing markets during the economic crisis and the COVID-19 pandemic in Turkey. The primary question of their study is whether the annual housing output was negatively affected by the economic crisis and the pandemic and whether the impacts of these extreme events are experienced homogeneously throughout the country. Their analysis reveals that compared to the international tendencies, total demand for housing increased, raising the housing transaction volume to record-high levels, and housing prices during the pandemic skyrocketed, accompanied by increasing inflation rates in Turkey. Their analysis also highlights a demand shift towards single-family houses, a widening price gap between single-family houses and flats, and the investment function of housing becoming prominent due to the high inflation rate. Therefore, the housing market deepened the societal inequalities during the COVID-19 pandemic.

Next, in a complementary article on housing, Subaşı and Baycan (2022) analyze the impact of the COVID-19 pandemic on the private rental housing prices in Turkey. They examine the changes in private rental housing prices through four main periods, which are identified based on the COVID-19 pandemic regulations and implementations in Turkey: (i) First Case of COVID-19 and First Restrictions (2020, March—2020, May); (ii) Controlled Social Life (2020, May—2020, November); (iii) New Precautions for COVID-19 Pandemic (2020, November—2021, July); (iv) New Normalization (2021, July—2021, December). Their findings reveal that the unit rent prices have generally increased from March 2020 to December 2021 in the whole country; nevertheless, while metropolitan cities have the highest unit rent price, the highest rent price rise has occurred in the provinces located in Central and Eastern Anatolia. They also emphasize that when the relationship between the confirmed cases and the trend in unit rental prices is examined, it is observed that rent prices in Turkey generally increased after the COVID-19 pandemic, unlike the effect of historical pandemics on housing markets. The article is attractive with its differentiating findings and contributes to the literature on how pandemics affect rent prices in free rental markets.
4 The economic impact of the COVID-19 pandemic from an international perspective

The crises experienced in the historical process have demonstrated that economic fragility is higher in countries where the degree of globalization is high. After the 2008 global financial crisis, the rising protectionism tendency led to a slowdown in globalization. Similarly, the COVID-19 pandemic has also demonstrated that economic fragility is higher in countries with high degrees of globalization. Restrictions on mobility, international travel, and cross-border economic activities have seriously affected the global economy (Vo and Tran 2021). This is one of the worst economic turbulence since World War II (Zhao et al. 2021). However, the impact of COVID-19 on international trade has been more significant. The restrictions affected mostly export and import. The exports and imports declined by 9.4 percent and 9 percent, respectively, in 2020 (IMF 2021b). In April 2020, approximately 80 countries implemented export restrictions on health products (Jean 2020). Therefore, the separation and specialization of production and consumption on a global level and the structure of the system of international trade shaped by global value chains (GVCs) have become the most critical issues during the COVID-19 pandemic. Against the increasing demand for essential products, particularly medical products, the lack of production capacity in many regions and complex interactions between global producers (Milberg and Winkler 2013; De Backer and Miroudot 2014) caused many supply-level limitations (Balzanz 2020). During this process, GVCs have also increased the economic fragility level in specific contexts, could not effectively meet the production needs at one of the most critical moments, and weakened the ability of many governments to respond effectively to the pandemic.

The third group of articles contributing to this Special Feature investigates the economic impact of the COVID-19 pandemic from an international perspective. These articles analyze the impact of the COVID-19 pandemic on international trade with a specific focus on exports and the fragility of the global trade structure and network in the framework of global value chains. Addressing the impact of the COVID-19 pandemic on international trade with a specific focus on exports, Cengiz and Manga (2022) analyze the long-term influence of COVID-19 on selected EU countries and Turkey’s exports through the panel ARDL method by considering different COVID-19 indicators. Their estimation results demonstrate that the COVID-19 pandemic negatively affects the exports in the selected EU countries and Turkey. While total COVID-19 cases strongly impact exports, exchange rate and inflation are also negatively associated with exports level. Their findings reveal that a 1 percent increase in total COVID-19 cases caused a decline in exports of 1.620 percent, and a 1 percent increase in COVID-19 stringency reduced exports by 0.102 percent. These findings highlight that lockdown measures to prevent the adverse impact of COVID-19 have a significant contractionary impact on exports.

The following article investigating the impact of COVID-19 from an international perspective focuses on the global supply and demand of medical goods
in the fight against COVID-19. Soyyiğit and Eren (2022) closely examine the context of the global trade network used to produce surgical masks and medical ventilators by employing a complex network analysis. They reveal this trade structure’s fragility in the Global Value Chains (GVCs) framework. The results of their analysis highlight that the trade network of these medical goods is under the control of a small number of super hubs, and the developed countries are at the top of the country rankings in terms of ventilator imports. The market system has not enabled a balanced supply of this vital product for less developed countries; therefore, this control mechanism increases the network’s vulnerability. Their overall evaluation highlights the failure of GVCs and laissez-faire policies in the COVID-19 era. There is no empirical study on the global trade of medical ventilators and its consequences, so this study fills an important gap in the literature.

5 Concluding remarks

This Special Feature focused on the social, economic, and spatial impacts of the COVID-19 pandemic in Turkey and analyzed the impacts of COVID-19 from different perspectives. Analyzing the impacts of COVID-19 from different perspectives, the articles in this Special Feature revealed the factors differentiating Turkey from the other countries and highlighted the challenges.

From an international perspective, Turkey differentiated from the other countries with its positive economic performance and growth rate, the fastest among the G20 countries and its record high-level exports during the COVID-19 pandemic. Turkey also differentiated from the other countries with its: (i) new economic model; (ii) the reduced policy interest rate; (iii) the most depreciating currency among emerging market economies; (iv) the inflation rates reached 80 percent; and (v) associated vulnerabilities such as dollarisation of the economy, the erosion of central bank reserves, and excessive credit growth.

Social, economic and spatial impacts of COVID-19 in Turkey are also differentiated within the country, and the impact of the crisis has not been similar in all regions. The findings of the articles revealed that: (i) the place-based factors affecting the spread of COVID-19 spatially differed in the country, especially in the East–West direction; (ii) the regions are economically affected at different levels, and their recovery also differed regionally; (iii) the size of the regional economy, as well as the innovation capacity and export levels of the regions, determined the vulnerability and resilience of regions; (iv) the responses to the pandemic differed considerably by urban functions; (v) among the sectors that have been diversely affected, the housing sector was remarkable with its transaction volumes and prices displaying an opposite trend to the international tendencies.

Altogether, the COVID-19 associated measures and the new economic model-associated policy measures have deepened Turkey’s existing social, economic, and spatial inequalities and highlighted several challenges from both international and national perspectives.
Declarations

Conflict of interest None.

References

Aksoy Khurami E, Özdemir Sari ÖB (2022) Trends in housing markets during the economic crisis and COVID-19 pandemic: Turkish case. Asia-Pac J Reg Sci. https://doi.org/10.1007/s41685-022-00251-w

Amankwah-Amoah J, Khan Z, Wood G, Knight G (2021) COVID-19 and digitalization: the great acceleration. J Bus Res 136:602–611

Anholon R, Rampasso IS, Dibbern T, Seraﬁm MP, Quelhas OL (2022) COVID-19 and decent work: a bibliometric analysis. Work 71:833–841

Arbel Y, Fialkoff C, Kerner A, Kerner M (2022) Do population density, socioeconomic ranking, and gini index of cities inﬂuence infection rates from Coronavirus? Israel as a case study. Ann Reg Sci 68(1):181–206. https://doi.org/10.1007/s00168-021-01073-y

Bailey D, Crescenzi R, Roller E, Anguelovski I, Datta A, Harrison J (2021) Regions in COVID-19 recovery. Reg Stud 55(12):1955–1965

Baltzan B. (2020) COVID-19 and the end of laissez-faire globalization. http://groundworkcollaborative.org/wp-content/uploads/2020/07/GWC2043_Globalization_2.pdf

Boumahdi I, Zaoujal N, Faddallah A (2021) Is there a relationship between industrial clusters and the prevalence of COVID-19 in the provinces of Morocco? Reg Sci Policy Pract 13:138–157. https://doi.org/10.1111/rsp3.12407

Çakmaklı C, Demiralp S, Yeşилаş S, Yıldırım MA. (2021) An evaluation of the Turkish economy during COVID-19. Centre for applied Turkey studies (CATS) | WP NR. 01, January 2021

Cengiz 0, Manga M (2022) Impact of COVID-19 pandemic on exports: new evidence from selected European Union countries and Turkey. Asia-Pac J Reg Sci. https://doi.org/10.1007/s41685-022-00249-4

Chen ZL, Zhang Q, Lu Y, Guo ZM, Zhang X, Zhang WJ, Lu JH (2020) Distribution of the COVID-19 epidemic and correlation with population emigration from Wuhan China. Chin Med J 133(09):1044–1050. https://doi.org/10.1097/CM9.0000000000000782

Coccia M (2020) Factors determining the diffusion of COVID-19 and suggested strategy to prevent future accelerated viral infectivity similar to COVID. Sci Total Environ 729:138474. https://doi.org/10.1016/j.scitotenv.2020.138474

Cone L, Brogger K, Berghmans M, Decuyper B, Forschler A, Grimaldi E, Hartong S, Hillman T, Ide- land M, Landri P, van de Oudeweetering K, Player-Koro C, Ronnberg L, Taglietti D, Vanermen L (2021) Pandemic acceleration: COVID-19 and the emergency digitalization of European education. Eur Educ Res J. https://doi.org/10.1177/14749041211041793

Cutrini E, Salvati L (2021) Unraveling spatial patterns of COVID-19 in Italy: global forces and local economic drivers. Reg Sci Policy Pract 13:73–108. https://doi.org/10.1111/rsp3.12465

Dannenberg P, Fuchs M, Riedler T, Wiedemann C (2020) Digital transition by COVID-19 pandemic? The German online food retail. Tijdschr Econ Soc Geogr 111(3):543–560

De Backer K, Miroudot S. (2014) Mapping global value chains. European Central Bank Working Paper Series No. 1677. Accessed from https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1677.pdf

Fissi S, Gori E, Romolini A, Contri M (2022) Facing COVID-19: the digitalization path of Opera di Santa Maria del Fiore in Florence. Eur Plan Stud 30(4):573–589

Furceri D, Loungani P, Ostry J, Pizzuto P (2020) Will COVID-19 affect inequality? Evidence from past pandemics. COVID Econ 12(1):138–157

Gibson L, Rush D (2020) Novel Coronavirus in Cape Town informal settlements: feasibility of using informal dwelling outlines to identify high risk areas for COVID-19 transmission from a social distancing perspective. JMI R Public Health Surveill 6(2):e18844. https://doi.org/10.2196/18844

Gopinath G. (2020) The great lockdown: worst economic downturn since the great depression, IMFBlog: Insights and analysis on economics and finance. https://blogs.imf.org/2020/04/14/the-great-lockdown-worst-economic-downturn-since-the-great-depression

Gross B, Zheng Z, Liu S, Chen X, Sela A, Li J, Havlin S (2020) Spatio-temporal propagation of COVID-19 pandemics. EPL (europhys Lett) 131(5):58003. https://doi.org/10.1209/0295-5075/131/58003
Taşcılar M, Arslanlı KY (2022) Forecasting commercial real estate indicators under COVID-19 by adopting human activity using social big data. Asia-Pac J Reg Sci. https://doi.org/10.1007/s41685-022-00254-7

TURKSTAT (2022) Press Release. Release Date: 03 August 2022 Number: 45796 https://data.tuik.gov.tr/Bulten/Index?p=Consumer-Price-Index-July-2022-45796

Tuysuz S, Baycan T, Altuğ F (2022) Economic impact of the COVID-19 outbreak in Turkey: analysis of vulnerability and resilience of regions and diversely affected economic sectors. Asia-Pac J Reg Sci. https://doi.org/10.1007/s41685-022-00255-6

Vo TD, Tran MD (2021) The impact of COVID-19 pandemic on the global trade. Int J Soc Sci Econ Invent 7(1):1–7. https://doi.org/10.23958/ijssei/vol07-i01/261

Wang J, Tang K, Feng K, Lv W (2020) High temperature and high humidity reduce the transmission of COVID-19. SSRN Electron J. https://doi.org/10.2139/ssrn.3551767

World Bank (2022) Turkey Economic Monitor, February 2022: Sailing Against the Tide. World Bank Group

Wu X, Nethery RC, Sabath BM, Braun D, Dominici F (2020) Exposure to air pollution and COVID-19 mortality in the United States. Medrxiv. https://doi.org/10.1101/2020.04.05.20054502

Zhang X, Rao H, Wu Y, Huang Y, Dai H (2020) Comparison of spatiotemporal characteristics of the COVID-19 and SARS outbreaks in mainland China. BMC Infect Dis 20(1):1–7. https://doi.org/10.1186/s12879-020-05537-y

Zhao Y, Zhang H, Ding Y, Tang S (2021) Implications of Covid-19 pandemic on China’s exports. Emerg Mark Financ Trade 57(6):1716–1726. https://doi.org/10.1080/1540496X.2021.1877653

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Springer Nature or its licensor holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.