**WHAT WOULD A RESILIENCE RESPONSE TO THE COVID-19 PANDEMIC LOOK LIKE; MULTI-LATERAL INTERNATIONAL REACTION.**

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# Introduction

The concept of resilience is frequently employed in today's crisis situations to examine how ecosystems recuperate from shock. Resilience is the idea that ecosystems can recuperate from shocks or can develop the capacity to handle shocks in the future. The Covid-19 epidemic is the first major catastrophe to be brought on by a coronavirus, causing a catastrophe with significant health casualties as well as widespread economic and social implications. With the help of policy examples, this study examines multilateral international reaction resilience response to the COVID-19 pandemic.

The outbreak has starkly brought to our attention the vulnerability of several of our most fundamental systems that were created by humans. Frontline professionals and the general public are now critically vulnerable to the virus itself due to the scarcity of masks, testing, oxygen tanks, and other crucial supplies. As a result of a vicious cycle of supply2and demand shocks, we have seen the catastrophic breakdown of entire supply chain, banking, and mass transit systems. Governments around the world are currently finding it difficult to deal with the shock caused by the outbreak, but eventually the global community2will get over the problem and start the2recovery process (Northcote, 2021) .

According to Baunach (2020), international bodies like the United Nations have offered two types of assistance to governments in this process: they have addressed urgent concerns and have suggested a strategy for addressing the longer-term problems the epidemic highlighted. In the near term, this entails determining who and what is most impacted, determining how helping them will2impact others, and emphasizing that tough trade-offs involving healthcare, socioeconomic, societal, and other objectives are unavoidable. If policies2are to be2effective over the long term, a strategy that responds to the systemic causes and effects of large shocks is required.

The Covid-19 problem2also demonstrates2how crucial it2is to hold back funds in case unanticipated systemic disruptions make it impossible for the system to operate regularly. The outbreak also emphasizes the necessity for greater global collaboration (building on current structures for disaster response) supported by facts, to handle systemic vulnerabilities and assist in mitigating systemic collapse given the interconnection of societies and economies. Helbing (2012) and2others have observed that there might be severe repercussions if the peculiarities of complex global ecosystems and challenges are not understood and managed.

# Covid-19 Outbreak

The New Approaches2to Economic Challenges (NAEC) Group2Conference on Thwarting Systemic Implosion in September22019 highlighted how increasing sophistication and interdependence have created numerous systems (such as those in the financial, healthcare system, cyber, etc.) vulnerable to widespread, unpreventable, and plunging collapse (Mirzayev, 2021, p. 104). These systems have overlooked resilience against upheavals whose shocks may place administrations, the population, and the ecosystem in a vulnerable position in their pursuit of optimum efficiency and effectiveness. More explicitly, the global level's potency of manufacturing capabilities and economic output into tinier, more productive fields has given rise to highly profitable yet fragile2supply chains and2economic transactions, the disturbance of which could have serious ramifications in unanticipated places (Allam, 2020, p. 119).

Prominent economists and academics have extensively discussed these ideas ever since the22007–2009 Great Recession, albeit mostly in a theoretical setting. The concern of what kind of shock would start such a sequence of events was more important than if systemic2risk would result in significant catastrophic devastation to the world's marketplace. The 2019–20202coronavirus pandemic is one2answer. The World Health2Organization (WHO) pronounced Covid-19 an outbreak on March 11, 2020, and it swept fast around the globe (Nasir, 2021, p. 2). The pandemic was used as an illustration of a long-standing2NAEC statement during the NAEC convention on Integrative2Economics on March 5–6, 2020. The world is not Newtonian2or linear, with actions leading to predictable outcomes.

In reality, we are a participant of a complicated system of geopolitical, socioeconomic, and ecological systems that2we are continually rearranging and that are impacting us. In such an environment, a little alteration can be relayed and magnified by the2system's connectivity to have significant effects that reach well beyond scope, duration, and location of the primary shock (Bhattacharya & Kango, 2021, p. 31). This was demonstrated in 2007–2008, when issues with a domestic market for house loans turned into a global recession that nearly brought down the entire international banking industry. Since the 2008 crisis sparked an economic slump and increased inequality, which in turn sparked sociopolitical unrest, we are still seeing its aftereffects a decade later (Nasir, 2021, p. 2).

Another example of how systems interact with one another is the2Covid-19 crisis. Similar to prior coronavirus pandemics, an animal-to-human virus transmitting was the primary cause. When we examine what actually transpired, we will undoubtedly discover that a number of social, economic, and ecological issues as shifting land use trends and farming techniques well as, more instantly, legally and illegally wildlife trade helped to create the situations where zoonosis2could become so harmful. However, we must go beyond our prompt conversations (Bhattacharya &2Kango, 2021, p. 31). We may contend that the recession of 2008, or more specifically, the austerity policies that left numerous healthcare facilities without the fundamental human and other assets essential to handle a dramatic, unanticipated increase in the population of patients, significantly worsened the 2020 medical condition (Mirzayev, 2021, p. 104).

Covid-19, in the viewpoint of Mokhtarzadeh (2021, p. 435), also demonstrates how cultural or contextual elements, such as belief in authorities and obligated to embrace their recommendations, a sense of2belonging, or the2type of neighborhood, can affect how an emergency plays out. To fully comprehend such factors, one must adopt an integrative economics-based2approach that draws on the methodologies and perspectives of a variety of disciplines in order to paint2a clear image of how the2economic model is formed and how it contributes to the greater "system of2systems" it is a core component of. Moreover, systems’ thinking enables us to choose sites of intervention2in a selective, adaptive manner while identifying the main drivers, interactions, and2dynamics of the2economic, social, and environmental2nexus that legislation tries to influence. Importantly, this enables us to assert the significance of system2resilience to a wide range of shocks and challenges, enabling systems2to recoup from lost operability and adjust to new challenges pertaining global economics, social concerns, behavior of a person, and the dangers of a more uncertain environment (Muhibbudin, 2020, p. 39).

# What are the impacts?

## Economic

According to Ndubuisi et al. (2022, p. 101), the OECD Interim2Economic Outlook, which was published on March 2, 2020, demonstrates how China's mass production and household consumption were severely reduced by regulations on the mobility of persons, products, and services, along with other containment initiatives like business shutdowns, and how the effect on the rest2of the globe2was increasing via enterprise hospitality & tourism, worldwide supply chains, commodity prices, and a decline in self-belief. In several economies, the shutdowns might have a first-round direct impact of a reduction in output2of between2one-fifth and one-quarter, with a possible reduction in consumer spending of about one-third. This exceeds anything encountered during the global recession of 2008. Additionally, this assessment only accounts for the early direct effects on the relevant sectors and ignores any further indirect effects (Ndubuisi et al., 2022, p. 101).

However, it is obvious that the shutdowns enforced on many nations will significantly harm short-term economic outlook, similar to a fall in average GDP growth rate of up to 2 percentage2points for each2month of lockdown, not accounting for the2potentially significant indirect effect (loss of2confidence etc.). Without any compensating factors, a three-month closure could result in annual GDP growth that is between 4-6 percentage2points lower than it would have been. The G20 nations decided to infuse USD 5 trillion2in government stimulus into the2global financial system at their conference on March 26, 2020, which could offset some of the worst possible effects (Sutcliffe, 2020, p. 81).

The effects of COVID-19 are clearly being felt in the global financial system, including heightened volatility and significant declines in stock prices. Asset owners will see a direct decrease in assets value if these declines signal the start of a protracted declining trajectory. Particularly, financed pensions and retirees' standard of living may be impacted by this (Ndubuisi et al., 2022, p. 101). Additional monetary policy relaxation by federal reserves could amplify the income2effect for retirees or encourage savers to make higher-risk investments. On the other side, low interest2rates could exacerbate wealth disparities by fueling inflation in2safe-haven assets like gold, treasury bonds, and estate development. With sovereign debt having risen since the 2008 global financial crisis to a record-high 47 percent of GDP, Covid-19 has highlighted the weakness in the capital markets. Considering the lockdown2and distribution network disruption, these businesses will find it difficult to pay back loans (Bhattacharya & Kango, 2021, p. 31).

The perspective currently is once more cast in the shadow2of 2008. According to the IMF's2Global Debt Index, the overall amount of global borrowing (governmental and non - governmental) increased by US$3 trillion from22017 to closure of 2018 (and up by over2USD90 trillion2from 2007). 2018 saw a slight increase in the worldwide average2debt-to-GDP ratio (ranked by each nation’s GDP) to 226 percent, up 1.5 percentage points from the year before (Muhibbudin, 2020, p. 39). Several administrations still have significant amounts of debt as a result of their actions to cope with the global recession and its repercussions, notwithstanding attempts to decrease deficit spending, and sovereign yields for some nations are beginning to expand. All the more concerning is private debt, which is fostered by low interest rates. According to IMF statistics, the industrial debt ratio in developed markets has been steadily rising from 2010 and is currently at the same percentage as in 2008, when it reached its last peak (Sutcliffe, 2020, p. 81).

## Health and social impacts

The most vulnerable group is the senior members of the society, but the impacts on them are not solely due to biological causes. The overall impact is2influenced by a number of variables, the elderly are particularly2vulnerable to disease-related2death, as well2as dangers associated with loneliness and insufficient social bonds, which are2exacerbated by the2dispersion of healthcare and personal support services. Numerous G20 nations estimate that about one-third of persons 65 and older reside in solitary (and twice as2many elderly women2live alone compared to2men, and they2generally have2lower pensions) (Day et al., 2021, p. 14). Older adults are almost2three times as likely than2young folks to have no social support, and if2they are sick, it could take much longer to diagnose and be difficult to care for them at homes. Naturally, this depends greatly on the nation in consideration, and elderly adults receive considerably good healthcare in nations with stronger social safety nets (Radotra, 2021, p. 129).

# Dealing with the Covid-19 shock and other epidemics through resilience strategies and policies

How must we respond to the significant disruption that Covid-19 has placed upon global financial markets, social event, and legislation, in addition2to the public health2system? How can2we handle the structural consequences that put pressure on many facets of world commerce and leadership, as well2as the psychological - behavioral impacts of uncertainty that can cause significant setbacks in economic growth at the personal and national levels? Shareholders have a choice between two fundamental ideologies and techniques. Up until now, the majority would have focused on averting a catastrophe from occurring in the2first place or, in the case that complete mitigation or evasion is not possible, significantly reducing its effects after the occurrence.

This method is initially politically attractive because it offers the chance that undesirable risks may be reduced before they result in significant issues, which is the foundation of traditional risk mitigation (i.e., to plan for and withstand disruptions). Nevertheless, in an universe of swift feedback mechanisms and progressively nested structures, where cascading2failures are unavoidable, such options may be ineffectual at safeguarding societies and economies and reducing disruptions, or would be prohibitively expensive to operate to the degree required to guarantee policymakers and2other interested parties of proper security (Michel-Kerjan, 2012, p. 497). In the interest of effectiveness, risk mitigation is all too frequently seen as a way to keep activities as compact as practicable, hence eliminating redundancy. With the absent of redundancy, systems are far more2vulnerable and have2little to no capacity2to withstand shocks, which can rapidly result in catastrophes (Linkov et al, 2019, p. 497).

The second strategy acknowledges that systemic vulnerabilities are fundamentally unforeseen, unexpected, and even2random and confronts them by enhancing system2resilience. Resilience highlights the significance of recuperation and adaptability in the wake of disturbance rather than relying simply on the capacity of system administrators to avert, minimize, resist, and absorb2any and all shocks (Ganin et al, 2017, p. 336). Such a viewpoint accepts that the numerous potential hazards in the coming years cannot be accurately foreseen, quantified, or comprehended in all of its implications.

Resilience recognizes that significant disturbances will indeed occur; in the coming years, climatological disturbance is likely to exacerbate other shocks, such as pandemics. Therefore, it is critical that fundamental systems2have the ability to recoup and adjust in order to guarantee their continued existence. They should also be able to take advantage of any innovative or disclosed possibilities that arise as a result of the catastrophes in order to enhance the system via wider structural reforms. For instance, the Covid-19 pandemic2offers a chance to more properly manage other catastrophes like global warming. This is frequently described as "bouncing2forward" rather than merely "bouncing2back” (Linkov, Trump, and Keisler, 2018, p. 336).

One of the structural2and defining characteristics2of the world today, which is constantly more sophisticated and unpredictable, is interconnectivity among systems. This has greatly benefited a large portion of the earth’s inhabitants and is a result of both economic advancement and geopolitical interdependence on a global scale. Limiting or reducing such interconnection would be a natural response to the Covid-19 epidemic, but such drastic regulatory measures would2not better safeguard nations or international economies against systemic dangers in the foreseeable years (Sutcliffe, 2020, p. 81). For a2post-Covid-19 society where institutions are created to assist recuperation and adjustment in the wake of shock, a concentration on building resilience within2the world financial order is rather a required advancement (Ganin et al, 2017, p. 336).

It is essential to combine resilience-based strategies with risk-based ones for managing epidemics and other systemic problems. Identification of uncertain/unforeseen hazards that are probable to have an impact on resilience is2one aim of risk mitigation for a system guided by resilience. Nevertheless, the resilience we're referring to here is indeed not resilience2in the manner that the OECD has traditionally used the term, which is the ability to withstand economic crises and return to prior conditions (Cooper, 2021, p. 45). Contemporary economies face systemic dangers that are becoming more challenging to model and frequently too complicated to be resolved for the "best reaction" using conventional risk evaluation methods that prioritize system resilience and capacity to endure attacks before breakdown (Linkov et al, 2019, p. 497). The emphasis of the emerging resilience strategy will be on a system's capacity to foresee, take in, recuperate from, and adjust to a variety of systemic problems (see figure below).

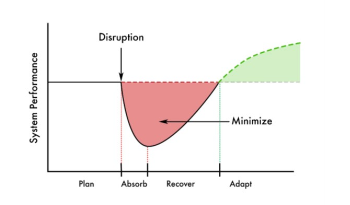


Figure 1

In the NAEC publication "Resilience Techniques and Policies to Control Systemic Threats," principles connected to systemic risks are outlined, and the conceptual and governing techniques and plans to handle these dangers (such as outbreaks) and create resilience to limit their repercussions are reviewed. This is meant to assist policymakers, in order to establish protections, barriers, and eventually resilience to physical, economical, sociological, and ecological shocks.

For integrated 21st-century macroeconomic, industrial, sociological, and health-based ecosystems to recuperate and adjust following disturbances, resilience is becoming an important important component of measures to prevent systemic collapse (Jüttner &2Maklan, 2011, p. 246). Detailed suggestions for enhancing resilience to control pandemics and other systemic dangers are established on NAEC findings and the research on resilience. They are as follows:

1. Design systems, including2infrastructure, supply chains, and economic, financial and public2health systems, to be2resilient, i.e. recoverable2and adaptable.
2. Develop methods2for quantifying resilience2so that trade-offs2between a system’s efficiency2and resilience can be2made explicit and2guide investments.
3. Control system2complexity to minimize cascading2failures resulting from unexpected2disruption by decoupling2unnecessary connections2across infrastructure and2make necessary connections2controllable and2visible.
4. Manage system2topology by designing2appropriate connection and communications2across interconnected2infrastructure.
5. Increase resources and redundancies in elements that are essential to the operation of the system.
6. Create real-time decision assistance technologies that automate the choice of administration options predicated on specific policy trade-offs and integrate information.

The International Risk2Governance council's (IRGC) recommendations for the Management of Systemic2Risks (Jüttner & Maklan, 2011, p. 246) contain a procedural alternative to such2resilience-based strategies. The IRGC outlines a multi-step process for identifying, analyzing, and managing systemic risks. It also discusses how to adequately prepare impacted systems for these kinds of threats by reducing potential threats and moving them closer to2resiliency-by-design. The IRGC’s cyclical2process for the governance2of systemic risk includes;

7. Specify the system's parameters and dynamics by exploring it.

8. Create scenarios taking into account potential ongoing and upcoming changes.

9. Establish objectives and the degree of risk and unpredictability that is acceptable.

10. Work together to build management plans for each eventuality.

11. Deal with unexpected obstacles and abrupt, crucial developments.

12. Select, refine, and put strategies into action.

13. Watch, absorb, evaluate, and adjust.

The objective of the IRGC experiment is not to create a predictive framework that can be applied to every ecosystem; this is2neither feasible nor beneficial. Rather, it aims to foster more reflective, team-based, and multi-system perspectives on potential risks lurking in a system's periphery as well2as where important operations or resilience issues must be addressed in the context of upcoming strategy formulation possibilities (Tamásy & Diez, 2016, p. 23).

Massaro et al. (2018) provide an illustration of using comparable strategies to combat epidemic diseases. The assessment of the transmission of communicable diseases among interconnected societies used the experimental resilience structure previously outlined. By proposing a concept of engineering2resilience that amplifies both the disturbance brought on by the virus's prevalence and the travel restrictions and social exclusion, they are able to track the2system-level reaction to the2epidemic. They indicate that prevention tactics including limiting travel and promoting self-initiated antisocial behavior lower the likelihood that a person will get the illness. Focus might also be devoted to how to maintain the system robust even under required and life-saving actions like curfews, considering the projected effects of limited population movements on the country's economic essential functions (Massaro et al, 2018).

Therefore, even while quarantine efforts are necessary to halt the spread of the pandemic, doing so could have unfavorable effects on the system's healthcare and economy. Depending on accords like global health rules, which control communicable diseases management globally and establish a structure for evaluating contingency measures at the regional and worldwide stages, pandemic management should take into account a variety of socio-technical2system elements (Putri et al., 2020, p. 259). For Covid-19, this means that nations should fight the urge to distance themselves from their foreign allies in an effort to increase domestic independence. The reaction against viruses must be global and cross-sectorial because they do not heed to country boundaries or organizational divisions.

Governmental measures will be far more successful if there is multilateral engagement, as demanded by the leadership of the G20 and G7. A unified, multilateral strategy to aid regional and global systems in recovering more quickly can be motivated and justified by the positive instances of diagnostic instruments, experts, practice guidelines, and even healthcare equipment being distributed throughout nations (Bansal, 2020, p.23). Protecting current ODA obligations with a focus on endangered populations and healthcare systems in emerging economies is one method to achieve this. The collaboration and methods to enhance global coordinating that evolved in addressing Covid-19 ought not to be permitted to disappear after the crisis concludes. Multilateral resources are economical and productive means to disburse financing quickly to regions where it is critically required.

To protect and restore lost economic2and social activities as a result of the Covid-19 epidemic, authorities are exploring a wide range of geopolitical and socioeconomic solutions (Tamásy &2Diez, 2016, p. 23). The value that the OECD adds to this effort is in identifying strategic possibilities to influence transitional and prospective policy in a way that not2only helps to recuperate from this catastrophe but also strengthens regional and global economic frameworks. Analysis and decision-making about policy measures to promote recovery are necessary right away. Any2short-term policy choices will have an impact on both the structure of the coming year's economic growth and the socioeconomic and geopolitical agendas of economic2globalization (Jüttner & Maklan, 2011, p. 246).

The globe's capacity to both prevent catastrophic global warming and strengthen its capacity to withstand the effects of climate disruption that have actually occurred will be significantly impacted by the policy decisions chosen for the recuperation. The OECD can utilize econometric techniques and other2analytic techniques to evaluate the effectiveness of various regulatory initiatives as it works to recoup from the Covid-19 crisis. These urgent requirements are quite important (James, 2020, p. 72). Contributions from the OECD to create policy agendas and strengthen state and international crisis measures will be similarly crucial. Fundamentals of system resilience2to systemic disturbance must be included into policy actions and objectives to overcome Covid-19 in both circumstances because failure to do so will impede prospective socioeconomic rebound for at2least the next ten years (OECD, 2021). If this work is a portion of a trilogy that also includes foresight and resilience, systems approach is the most effective tool we2have at our2disposal to do it. Theoretically, complex entities like the financial2markets or the general healthcare service exhibit catastrophes as an inherent trait.

Practically speaking, decision-makers must take into account the notion that all systems, such as the institutions they are creating policy for, will collapse eventually. They must therefore be ready, even though doing so may not seem cost-effective before a crisis arises. The argument that threats are only apparent in retrospect does not hold up to critical analysis (Gazzola2et al., 2022, p. 32). Extensive simulation operations in OECD nations precisely indicated how a catastrophe like Covid-19 may develop, but from what has transpired, it appears that they2were not implemented, or not adequately (OECD, 2021). In intangible fields like financial systems, resilience is a reliable strategy. The current financial crisis was anticipated by many, and numerous analysts cited borrowing as a key cause of system vulnerability. A systems-based policy initiative would acknowledge that, even since we do not yet understand what will cause the next disaster, we do2know it will occur, that specific aspects can increase its likelihood and harm, and that2there are improved policy choices than waiting2for it to occur and then reimbursing for bailout funds (Cowell, 2020, p. 263).

# Conclusion

A resilient mindset accepts that it is impossible to forecast, measure, or completely comprehend the effects of all possible future dangers. Employing such a strategy necessitates reevaluating our priorities, particularly the significance of efficiency and optimization. According to the discipline of system design, attempting to optimize just one component of a sophisticated system can lead to the system becoming unstable as a whole. One of the greatest effective parts of the worldwide economic, overseas supply networks, demonstrate this. It is inconceivable to forecast where2the next catastrophe will arise due to the extreme unpredictability inherent with complex ecosystems, but it2does not preclude us from using the experiences from the prior events to plan a systemic reaction for the2future. The fact that catastrophes do not recur is one thing we may learn from2COVID-19. In other cases, the notion that we2were successful in controlling earlier coronavirus outbreaks like SARS contributed to complacent about our capacity to control any upcoming catastrophe.

Regarding the other serious catastrophe we are dealing with; the climate change issue we must not be2complacent. In regards of the system, this is2more akin to stress than2a shock, with everything that entails of a rapid, unforeseen event. We learn from systems analytics that2nonlinear pressures like global climate change exist. The system may remain to operate relatively properly for a while and only decline gradually, but it2may eventually hit a critical threshold from which2it cannot recoup, leading to extraordinarily swift collapse. Covid-19 demonstrates that we must take action right away since we cannot predict how alterations in one ecosystem may develop and affect other ecosystems, in this instance, how a viral mutation might devastate the global economy. Nevertheless, we may assume that severe harm to an ecological ecosystem, like biodiversity depletion, or substantial alterations, like rising sea levels or a spike in the frequency of weather extremes, will also have profound effects on economic2and social processes. While doing so, it's important to remember that the next catastrophe might not have "natural" causes. For instance, it can be the result of an accident2or a cyber-attack that causes the telecommunications networks to breakdown.

# Reference

Allam, Z. (2020). Oil, health equipment, and trade: Revisiting political economy and international relations during the COVID-19 pandemic. *Surveying the Covid-19 Pandemic and its Implications*, 119-127. <https://doi.org/10.1016/b978-0-12-824313-8.00009-7>

Bansal, T. (2020). Behavioral finance and COVID-19: Cognitive errors that determine the financial future. *SSRN Electronic Journal*, *3*(2), 23-38. <https://doi.org/10.2139/ssrn.3595749>

Baunach, L. (2020, April 20). *Why a strong multilateral response is key to tackling COVID-19*. openDemocracy. <https://www.opendemocracy.net/en/oureconomy/why-strong-multilateral-response-key-tackling-covid-19/>

Bhattacharya, R., & Kango, U. (2021). The COVID-19 pandemic and its impact on global political economy. *The COVID-19 Pandemic, India and the World*, 31-49. <https://doi.org/10.4324/9781003220145-3>

Cooper. (2021). Economic resilience during crisis: Opportunities and challenges from COVID-19. *Strengthening Economic Resilience Following the COVID-19 Crisis*, *3*(2), 45. <https://doi.org/10.1787/e4299b7a-en>

Cowell, M. (2020). Interpreting and defining economic resilience: Regional resilience in policy practice. *Handbook on Regional Economic Resilience*, 263-279. <https://doi.org/10.4337/9781785360862.00022>

Day, C., Couch, R., & Dhesi, S. (2021). Discovering an environmental health perspective on COVID-19. *Covid-19*, 14-19. <https://doi.org/10.1201/9781003157229-2>

E. Massaro, A. Ganin, N. Perra, I. Linkov and A. Vespignani, (2018) [Resilience management during large-scale epidemic outbreaks](https://www.nature.com/articles/s41598-018-19706-2), Nature Scientific Reports 8, 1859 (2018) Also available at: <http://www.oecd.org/naec/integrative-economics/Resilience_management_during_epidemics.pdf>

Ganin, L., Biondini, F., Titi, A., Keisler, & Seager. (2017). Resilience and efficiency in transportation networks. *transportation networks*, 336-336. <https://doi.org/10.1201/9781315207681-172>

Gazzola, P., Pavione, E., & Pessina, I. (2022). Resilience management during the pandemic outbreak of COVID-19. *Organizations, Strategic Risk Management and Resilience*, 32-57. <https://doi.org/10.4324/9781003268963-3>

Helbing, D. (2012). *Systemic risks in society and economics*. Springer, Berlin, Heidelberg.

James. (2020). Coronavirus (COVID-19): SME policy responses. *OECD Policy Responses to Coronavirus (COVID-19)*, *3*(2), 72. <https://doi.org/10.1787/04440101-en>

Jüttner, U., & Maklan, S. (2011). Supply chain resilience in the global financial crisis: An empirical study. *Supply Chain Management: An International Journal*, *16*(4), 246-259. <https://doi.org/10.1108/13598541111139062>

Linkov, I., Trump, B. D., & Keisler, J. (2018). Risk and resilience must be independently managed. *Nature*, *555*(7694), 30-30. <https://doi.org/10.1038/d41586-018-02567-0>

Linkov, I., Trump, B. D., Poinsatte-Jones, K., Love, P., Hynes, W., & Ramos, G. (2019). Resilience at OECD: Current state and future directions. *IEEE Engineering Management Review*, *46*(4), 128-135. <https://doi.org/10.1109/emr.2018.2878006>

Michel-Kerjan, E. (2012). How resilient is your country? *Nature*, *491*(7425), 497-497. <https://doi.org/10.1038/491497a>

Mirzayev, N. (2021). COVID-19 pandemic and innovative agrarian economy. *UKRAINIAN BLACK SEA REGION AGRARIAN SCIENCE*, *110*(2), 104-109. <https://doi.org/10.31521/2313-092x/2021-2(110)-13>

Mokhtarzadeh, H. (2021). Toward Agile strategies for enhancing community resilience following the COVID‑19 pandemic: An interview study. *COVID-19 Pandemic, Geospatial Information, and Community Resilience*, 435-438. <https://doi.org/10.1201/9781003181590-41>

Muhibbudin, I. (2020). Prevalence of COVID -19 pandemic: A paradigm shift to hydrogen economy. *SAGE journal*, *1*(2), 39. <https://doi.org/10.20944/preprints202012.0190.v1>

Nasir, L. (2021). Impact of the COVID-19 pandemic on the global economy. *Journal of Clinical and Laboratory Research*, *2*(4), 01-02. <https://doi.org/10.31579/2768-0487/019>

Ndubuisi, G., Yuni, D., & Tingum, E. N. (2022). Economic sentiment and climate transition during the COVID-19 pandemic. *Contributions to Finance and Accounting*, 101-121. <https://doi.org/10.1007/978-3-030-98542-4_7>

Northcote, N. (2021, March 2). *Strategic resilience during the COVID-19 crisis*. McKinsey & Company. <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/strategic-resilience-during-the-covid-19-crisis>

OECD. (2021). Housing amid COVID-19: Policy responses and challenges. *OECD Policy Responses to Coronavirus (COVID-19)*. <https://doi.org/10.1787/cfdc08a8-en>

Putri, M. D., Xu, C., & Akwetteh, L. N. (2020). Financial behavior during COVID-19: Cognitive errors that can define financial future. *Open Journal of Social Sciences*, *08*(10), 259-269. <https://doi.org/10.4236/jss.2020.810017>

Radotra, B. D. (2021). Pathogenesis of COVID-19 infection. *Delineating Health and Health System: Mechanistic Insights into Covid 19 Complications*, 129-134. <https://doi.org/10.1007/978-981-16-5105-2_6>

Sutcliffe, C. (2020). The implications of the COVID-19 pandemic for pensions. *A New World Post COVID-19*, 81-98. <https://doi.org/10.30687/978-88-6969-442-4/017>

Tamásy, C., & Diez, J. R. (2016). Regional resilience, economy and society. *SAGE journal*, *2*(1), 23-38. <https://doi.org/10.4324/9781315604435>