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### Systemic Risk, COVID-19 and Climate Change

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#### *Abstract*

*From an economic perspective, risk is mainly viewed on a micro level, namely risk to enterprise(s), or on a meso level, in case of industries or investment portfolios. More lately nano, macro (systemic), and cosmic (existential) levels of risks are recognised. Given the limited discussion about these types of risks, this brief explores them in the context of COVID-19 and climate change, mainly by emphasising the importance of recognising and mitigating systemic risk.*

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#### Introduction

In recent times, the cases of climate change and the COVID-19 pandemic have been prominent examples which demonstrate the interconnectedness of systems. The former is a rapidly intensifying process driven by anthropogenic actions that have global sustainability consequences and considerable unevenness in regional impacts. The latter has been a health tragedy, with no nation left unaffected, and led to entrenched economic insecurity across the world during the worst crisis

since the Great Depression<sup>1</sup>. Satisfactory policy responses to the pandemic and climate change require coordinated global efforts to mitigate the manifestation of the most severe effects.

Various types and scales of risk apply in these two cases. These are described succinctly in this Brief to provide necessary context. However, given the interconnectedness of impacts, the focus of this Brief is on exploring the topic of systemic risk – its characteristics, importance, and relevance in the context of the COVID-19 pandemic and climate change from a European policy perspective.

#### Systemic risk

Drawing from the Intergovernmental Panel on Climate Change (IPCC), a risk constitutes the “potential for adverse consequences from a hazard for human and natural systems, resulting from the interactions between the hazard and the vulnerability and exposure of the affected system” (IPCC, 2018, p. 33).<sup>2</sup> In the case of systemic risk, a trigger event or a tipping point, which can be an institutional failure or economic shock “causes a chain of bad economic consequences – sometimes referred to as a domino effect”.<sup>3</sup> The chain of

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<sup>1</sup> OECD 2021.

<sup>2</sup> IPCC 2018, p. 33.

<sup>3</sup> Schwarcz 2008, p. 198.

consequences may result in failure of financial institutions or markets, such as in the case of the economic crisis in 2008. Therefore, systemic risk may be described as a risk to a financial system, rather than a risk within a system.<sup>4</sup> The focus on the financial system is, however, insufficient in the context of major global crises such as the COVID-19 pandemic and the climate change crisis.

Before discussing systemic risk in the context of the COVID-19 pandemic and the climate crisis, the risk hierarchy should be explained briefly:

1. **Nano level risk:** This level considers risk to individuals, including investors, or families.
2. **Micro level risk.** This level considers risk to individual business enterprises.
3. **Meso level risk.** This level considers risk to industries or investment portfolios.
4. **Macro level risk.** This level considers the interconnectedness of systems and sustainability implications.
5. **Cosmic level risk.** This level considers existential risks to ecosystems, people, and communities.<sup>5</sup>

There is evidence that the meso level of risk (systemic) materialises more commonly than many people realise. Other examples in recent times include the Piper Alpha disaster in 1988, the Northeast Blackout in parts of the North-eastern and Mid-western United States in 2003, the Space Shuttle disaster in 2003, the financial crisis of 2008, and the BP Deepwater Horizon oil spill in the Gulf of Mexico in 2010.

## **COVID-19 and climate change**

The impacts of the COVID-19 pandemic were global in scale and systemic in nature. The processes of globalisation have ensured that even some of the remotest nations on the planet are better linked – in

communication and transportation – and economically dependent on the rest of the world than ever before. This has undoubtedly contributed to the spread of the virus, with island nations such as Greenland and Iceland providing rare examples of relatively successful containment strategies.<sup>6</sup> The COVID-19 pandemic has led to risks across all scales, including individuals, investors, businesses, industries, and economies.

Many of the pandemic's risks are systemic in character and demonstrate spillover effects and interlinked manifestations. A World Economic Forum (2020) report determined that these could be classified as economic shifts; sustainability setbacks; technology dependence; and societal anxieties.<sup>7</sup> Examples of impacts include economic effects on key industries, such as tourism, that then translate into negative consequences for dependent sectors, such as construction, transportation, hospitality, and entertainment.

Systemic risk related to climate change derives from rapid growth in greenhouse gas emissions, which only stalled briefly during the COVID-19 pandemic in 2020. Globalisation has contributed to the formation of increasingly complex connections between many different socio-economic systems, and climate change has led to ongoing changes in exposure and vulnerability, with cascading effects a defining feature of systemic risk in this context. A recent study<sup>8</sup> concluded that the extent of risk propagation and its duration depends on the various discrete risks that are interconnected and comprise the systemic risk linked to climate change. In addition, there is a need to consider a broad variety of impact domains in policy responses given the breadth of the implications, which need to include the economy, society, homeland security, human health, and living conditions.

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<sup>4</sup> Schwarcz 2008.

<sup>5</sup> Thurm et al. 2008.

<sup>6</sup> Cook & Jóhannsdóttir 2021.

<sup>7</sup> WEF 2020.

<sup>8</sup> Li et al. 2021.

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## The EU and systemic risk

The European Systemic Risk Board (ESRB) has responsibility for the macroprudential oversight of the European Union's financial system and the prevention and mitigation of systemic risk. Its remit encompasses banks, insurers, asset managers, shadow banks, and financial market infrastructure. The main analytical tool established by the ESRB is a Risk Dashboard, a group of quantitative and qualitative indicators published on a quarterly basis. The indicators are categorised according to the topics of macro risk; credit risk; funding and liquidity; market risk; profitability and solvency; structural risk; and risk related to central counterparties.

Although the ESRB's indicators are broad and capture the myriad financial dimensions of systemic risk, they lack the capacity to evaluate the sustainability implications of systemic risk, as these pertain to the COVID-19 pandemic and climate change. This requires recognition and monitoring of cascading effects, especially on interconnected sectors and industries. The tackling of the immediate health-related and economic and sustainability implications of COVID-19 demanded immediate actions by the policymakers of nation-states. In a similar vein, national governments and agencies must respond to the severest impacts of climate change through relief and regeneration packages. However, although greenhouse gas emissions from economic activities lead to locally felt consequences in the form of climate change impacts, reducing these effects demands coordinated global (rather than just regional, such as via the European Union)

policy action that recognises and responds to the scale of the problem, both geographically and in terms of the diversity/scales of risks. Similarly, long-term mitigation of the effects of the COVID-19 pandemic requires coordinated global efforts to distribute vaccines around the world in order to reduce the overall incidence of infections and minimise the probability of new and more dangerous mutations emerging in the future.

## Conclusion

Both the COVID-19 pandemic and climate change impacts are cases involving systemic risk. It is contestable whether the COVID-19 pandemic presents a risk on the same scale as climate change, not least because vaccination programmes, when rolled out on a large scale, have already demonstrated capacity to mitigate the severest health impacts of infection. It is not possible to mitigate impacts such as rising sea levels, wildfires, and devastating droughts through preventative action in the same manner. Instead, policy makers must increasingly focus on how best to adapt to inevitabilities, with the livelihoods and sustainability of communities potentially permanently compromised. Understanding the broad array of systemic consequences of events such as the COVID-19 pandemic and climate change can be helpful, especially for the development of monitoring indicators that evaluate the full array of sustainability implications linked to cases of system risk. These can be useful tools for policy makers. Ultimately, regional alliances such as the EU's vaccination programme or the Effort Sharing Agreement of the Paris Accord are useful approaches to mitigating the impacts of the pandemic and climate change. However, only coordinated global action has the capacity to effectively mitigate the worst effects.

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