

NEW RISKS IN THE AGE OF TRANSITION

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BALANCING RISKS AND INNOVATION: A THEORETICAL MODEL OF AI'S
IMPACT ON GLOBAL VALUE CHAINS AND THE SHIFT TOWARDS
NEARSHORING AND RESHORING

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Abstract

This paper introduces a theoretical model to analyze the evolving dynamics of Global Value Chains (GVCs) in the context of rapid advancements in Artificial Intelligence (AI) and the proliferation of platform economies. We explore how AI, particularly when integrated within platform-based business models, is reshaping traditional GVC structures, emphasizing a trend towards nearshoring and reshoring, especially in the service sector. The model examines the implications of this shift, balancing the innovative potential of AI against emerging risks such as labor market disruptions, economic inequalities, and the centralization of control within platform operators. We discuss how AI-driven platforms are influencing consumer expectations for personalized and efficient services, leading companies to reconsider the geographical dispersion of their operations. Additionally, the paper addresses the challenges posed by this transformation, including the need for strategic workforce reskilling, regulatory adaptations, and considerations for equitable and sustainable economic growth. This research contributes to the understanding of the changing landscape of international trade and economics, providing insights for businesses and policymakers in navigating the complexities of an AI-dominated future. The findings underscore the importance of strategic planning and policy interventions to ensure a balanced transition towards more localized and controlled GVCs in the era of AI and platform economies.

Keywords

Artificial Intelligence; Global Value Chains; Platform Economy; Nearshoring and Reshoring; Labor Market Disruption

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GLOBAL VALUE CHAINS BALANCING RISKS AND INNOVATION



Global Risks 2023 (World Economic Forum)

Current crises

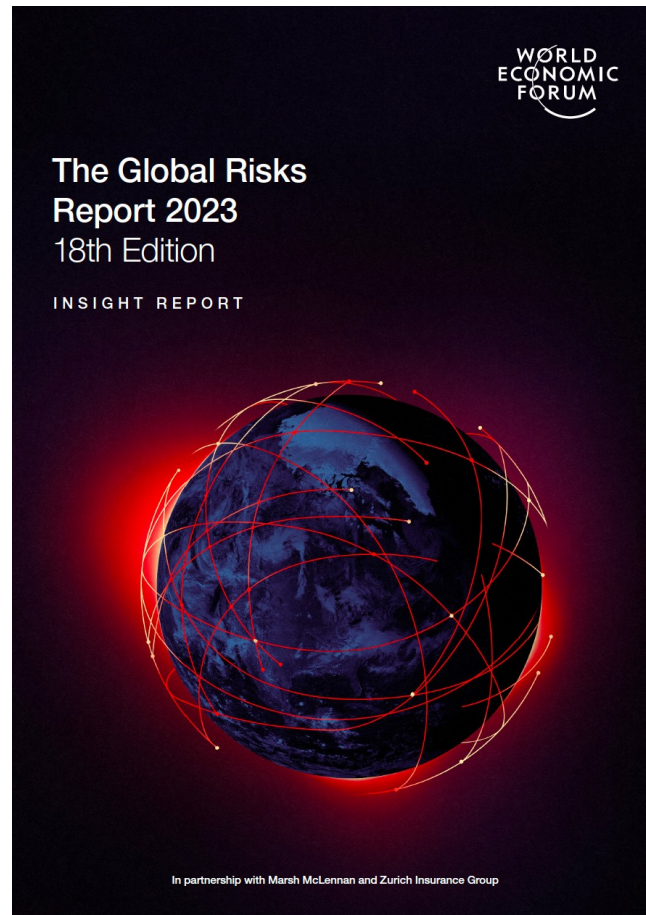
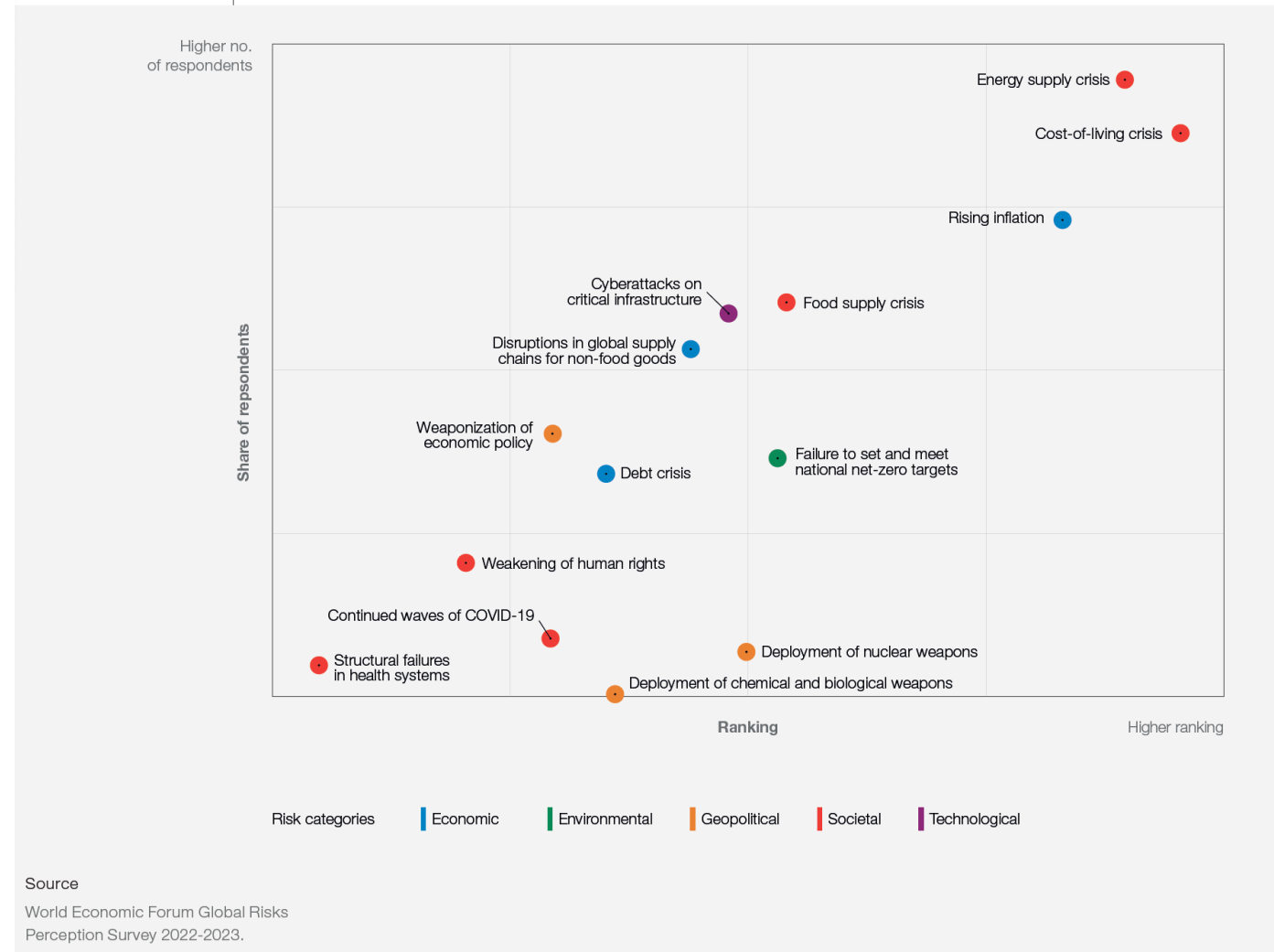
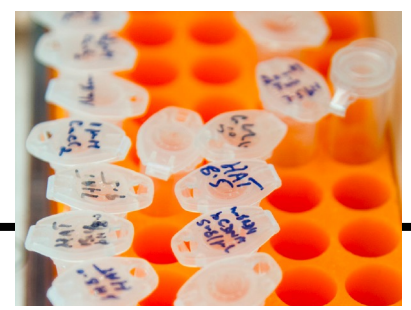
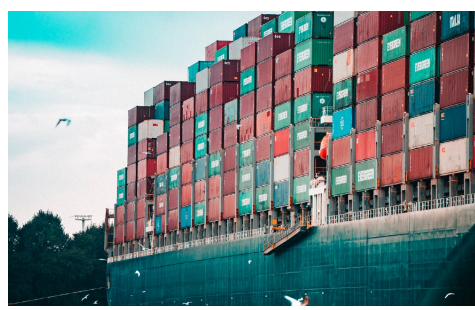


FIGURE 1.1

Currently manifesting risks

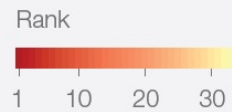
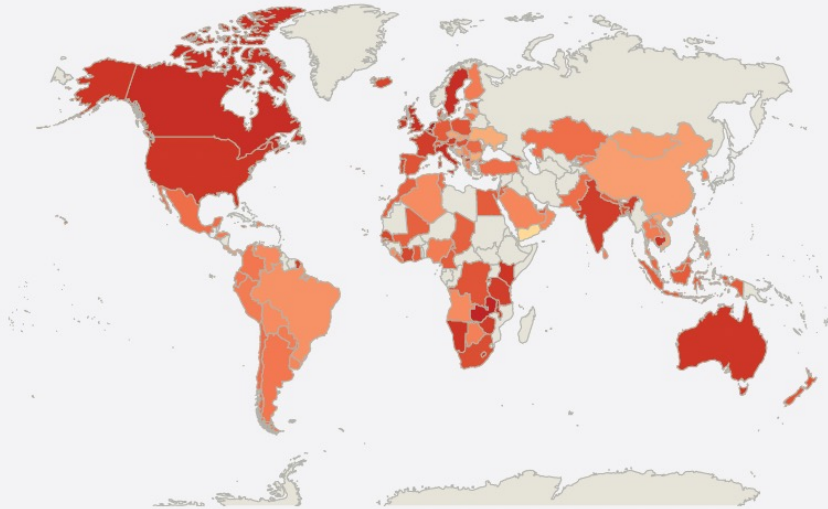
"Please rank the top 5 currently manifesting risks in order of how severe you believe their impact will be on a global level in 2023"





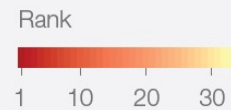
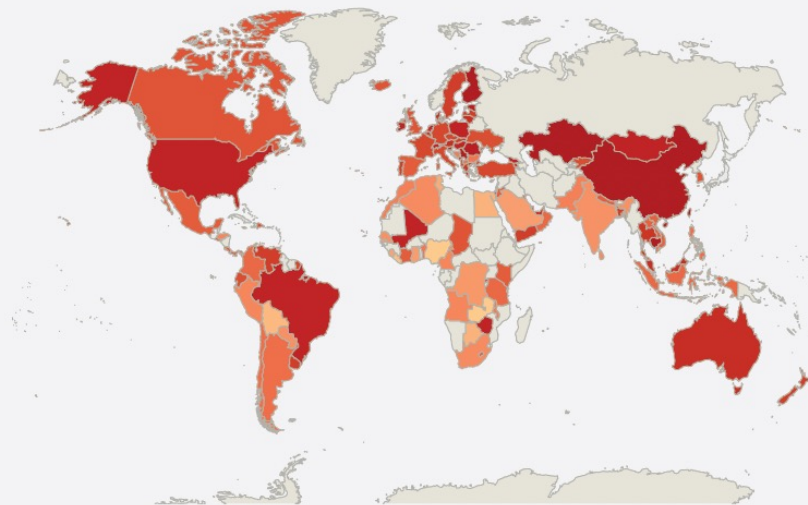
Are the old risks over?

A. Failure of climate-change adaptation



Source
World Economic Forum Executive Opinion Survey 2022.

A. Geoeconomic confrontation



Source
World Economic Forum Executive Opinion Survey 2022.



New Risks in the Age of Transition

In the age of transition, characterized by **rapid technological advancements**, **globalization**, and **environmental changes**, **new forms of risk** have emerged, necessitating **a nuanced understanding** and **interdisciplinary approaches** to risk assessment and management :

- The digital revolution presents **new risks** related to cybersecurity, data privacy, and the ethical implications of artificial intelligence (AI).
- The age of transition is marked by increasing complexity and interconnectivity, leading to **emergent risks** in areas such as public health and economic stability.
- The transition to a more sustainable and climate-resilient society introduces **new risks**, particularly in the context of climate change and biodiversity loss.



FIGURE 2.4

Impacts of climate change on ecosystems

Confidence in attribution to climate change

Ecosystems	Changes in ecosystem structure			Species range shifts			Changes in timing (phenology)		
	Terrestrial	Freshwater	Ocean	Terrestrial	Freshwater	Ocean	Terrestrial	Freshwater	Ocean
Global	High	High	High	High	High	High	High	High	High
Africa	High	High	High	High	Lim. evidence	High	Lim. evidence	Low	Low
Asia	High	Medium	High	Low	Medium	Lim. evidence	Low	Low	Medium
Australasia	High	High	High	High	Lim. evidence	High	High	Lim. evidence	Low
Central and South America	High	High	High	High	High	High	Lim. evidence	Lim. evidence	Low
Europe	High	High	High	High	High	High	High	High	High
North America	High	High	High	High	High	High	High	High	High
Small Islands	High	High	High	High	High	High	High	Lim. evidence	Medium
Arctic	High	Medium	High	High	High	High	High	Medium	High
Antarctic	Medium	Lim. evidence	Medium	Medium	Lim. evidence	Medium	Medium	Lim. evidence	Lim. evidence
Mediterranean region	High	Lim. evidence	High	High	Medium	High	High	Lim. evidence	Medium
Tropical forest	High	Lim. evidence	N/A	Medium	Lim. evidence	N/A	Lim. evidence	Lim. evidence	N/A
Mountain regions	High	High	N/A	High	Medium	N/A	High	Low	N/A
Deserts	High	N/A	N/A	High	N/A	N/A	Lim. evidence	N/A	N/A
Biodiversity hotspots	High	Lim. evidence	High	High	Lim. evidence	High	High	Lim. evidence	Not assessed

Source

IPCC, 2022.⁶

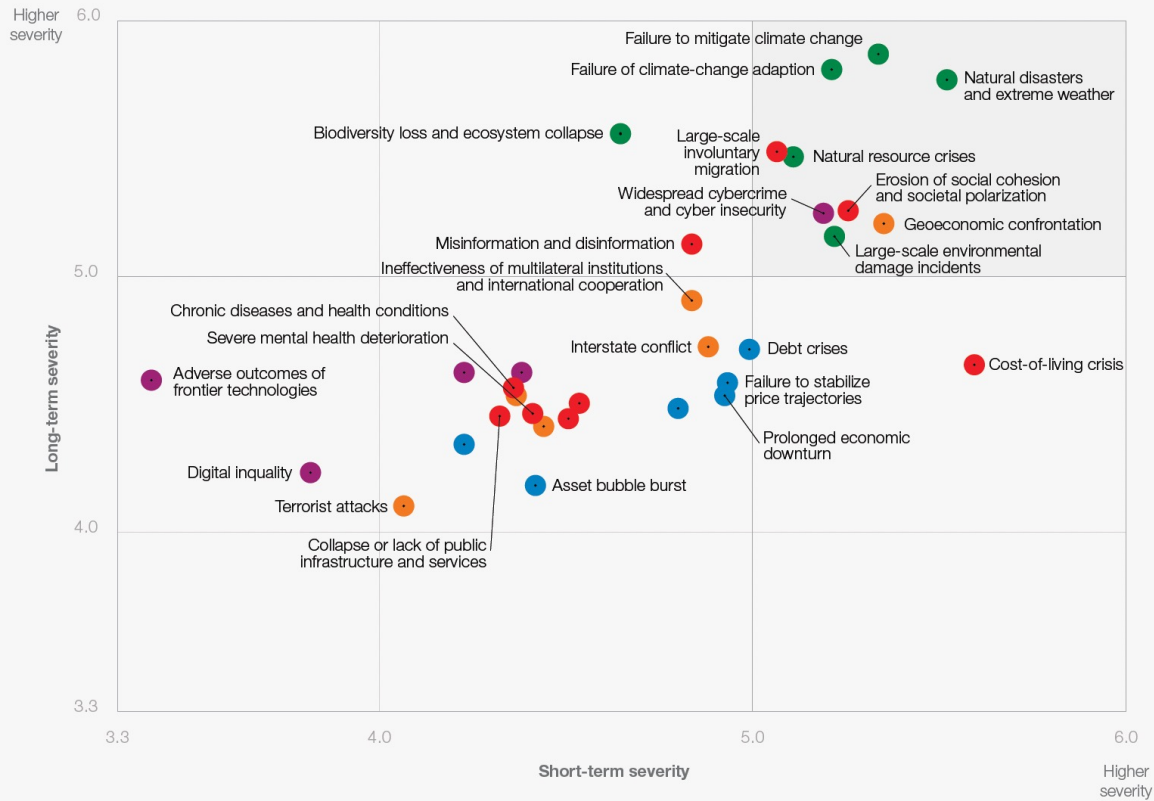


Global Risks 2023 (World Economic Forum)

Tomorrow's Catastrophes

FIGURE 2.2

Relative severity of risks over a 2 and 10-year period



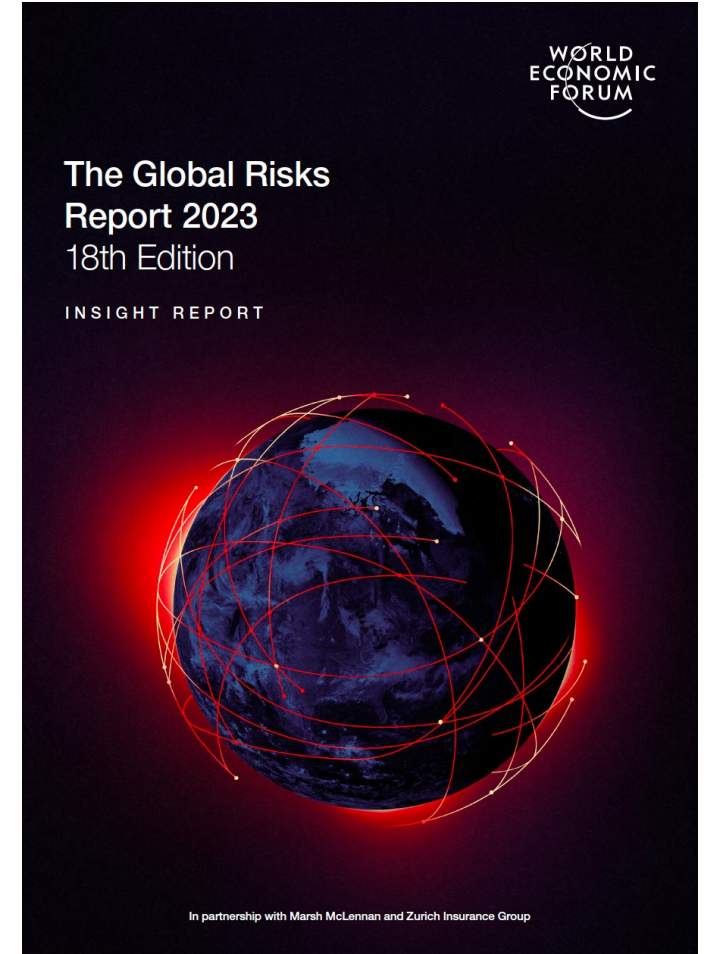
Risk categories | Economic | Environmental | Geopolitical | Societal | Technological

Source

World Economic Forum Global Risks Perception Survey 2022-2023.

Note

Severity was assessed on a 1-7 Likert scale [1 – Low severity, 7 – High severity].



Supply chain reconfiguration in the current global context



Addressing the new risks associated with supply chain reconfiguration in the current global context is **crucial**, particularly considering :

- recent disruptions
- geopolitical landscape
- technological advancements

Supply chain reconfiguration in the current global context



- Limão (2016) discussed the impact of trade policies on supply chain decisions, noting that **protectionist measures** can lead to **inefficiencies and increased costs**.
- Rodrik (2018) discusses how globalization can also lead to **complex dependencies** that **may not always align with the political or ethical standards of democratic societies**
- The COVID-19 pandemic dramatically exposed these **vulnerabilities, disrupting supply chains worldwide** (Ivanov & Dolgui, 2020).
- Sheffi (2020) emphasized the **fragility of global supply chains**, particularly in the face of large-scale disruptions such as **natural disasters** or **geopolitical tensions**.
 - The evolving geopolitical landscape, marked by the tension points in regions like Taiwan and the rise of autocratic regimes, presents **complex challenges to global stability and security**.

Supply chain reconfiguration in the current global context

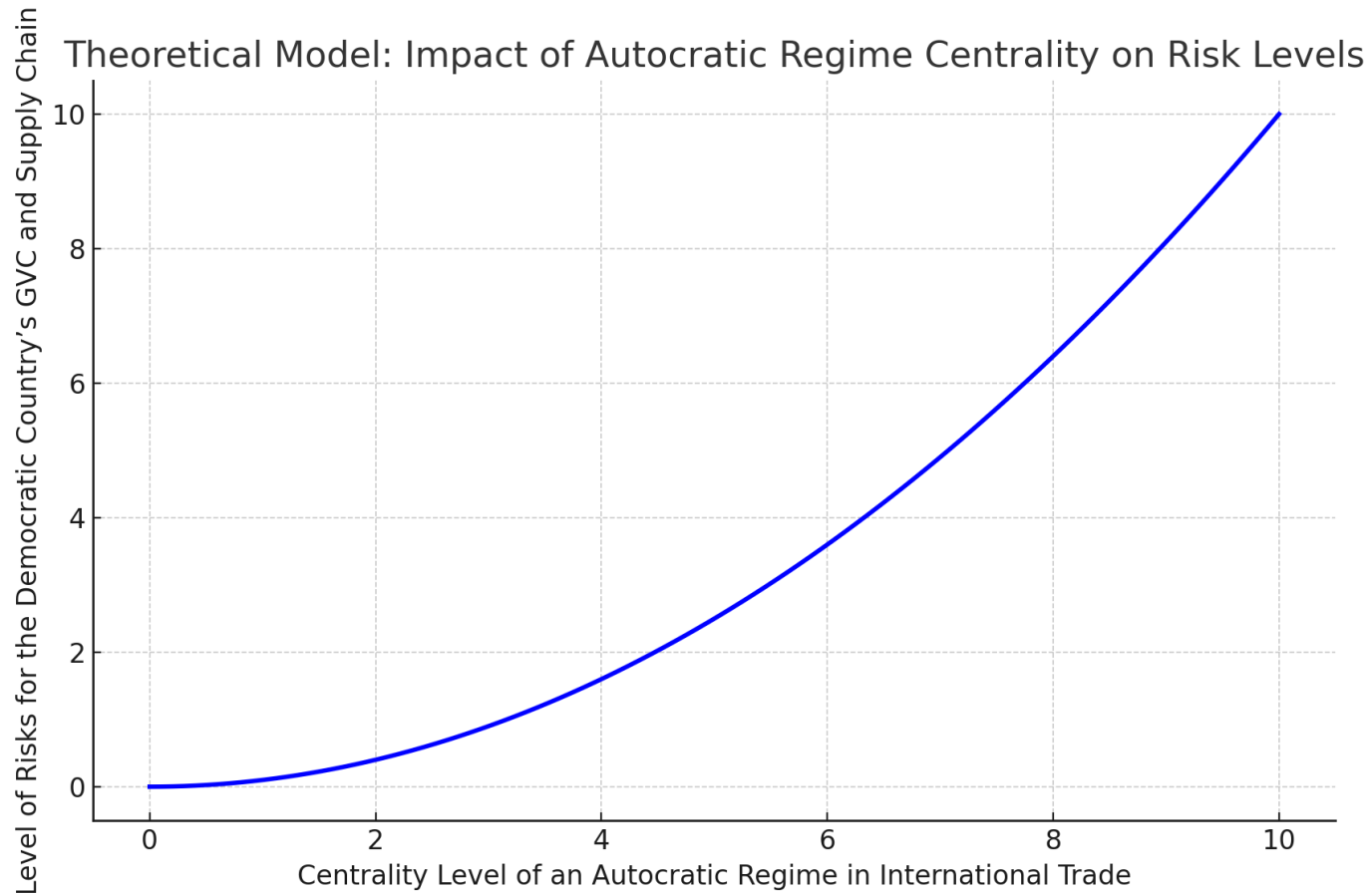


The theoretical contribution of our paper revolves around the **evolving dynamics of international trade and supply chains, particularly how democracies engage with autocratic regimes.**

Historically, it has been common for democratic nations to engage in trade with autocratic regimes, primarily for access to natural resources or cheap labor.

- **The level of risks for a democratic country's Global Value Chains (GVC) and supply chain increases with the growing centrality of an autocratic regime in international trade.**
-

The impact of trade with Autocratic Regime



- The curve indicates a non-linear relationship, where the level of risks increases more dramatically as the centrality of the autocratic regime grow

Venezuela : political and economic instability under Maduro's regime

Bangladesh : labor rights abuses in the clothing industry

Supply chain reconfiguration in the current global context



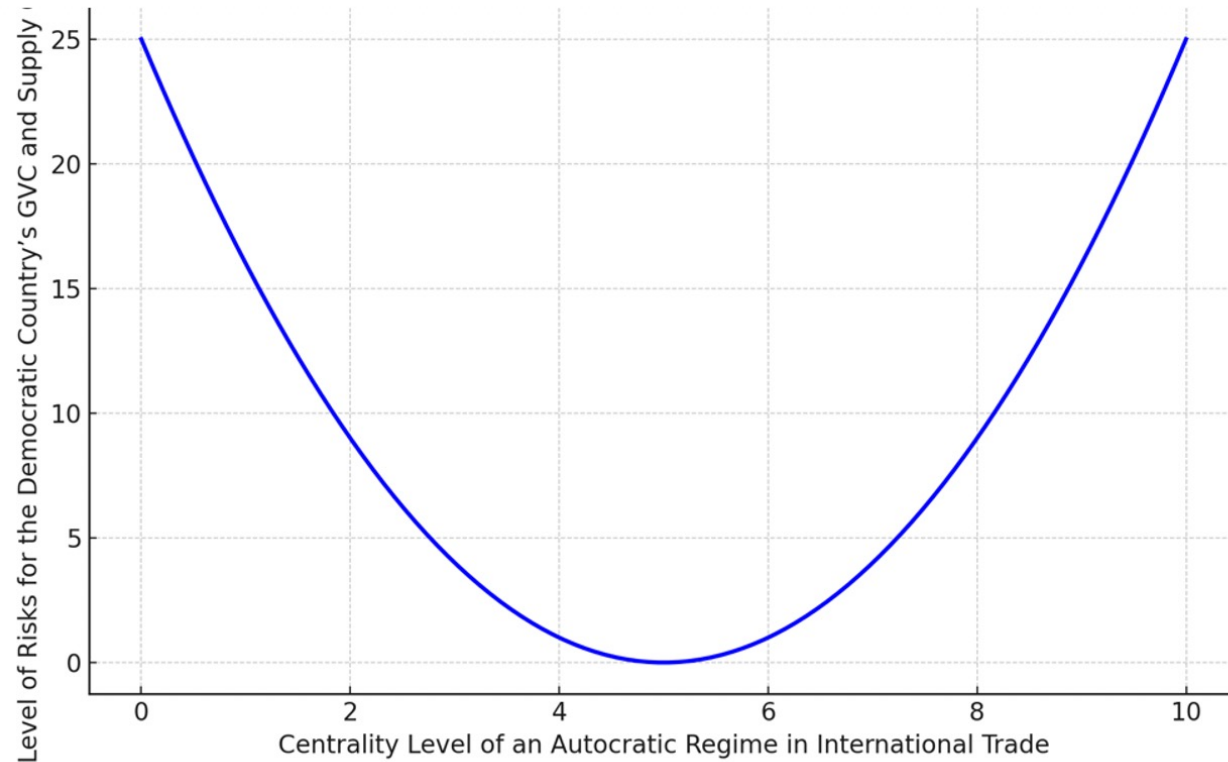
Traditionally, GVCs have been **optimized for cost-effectiveness**, often resulting in the **offshoring of services to regions with lower labor costs**.

Pietrobelli and Rabellotti (2011) discuss how involvement in GVCs can lead to **significant learning and upgrading opportunities for firms in developing countries**.

Additionally, Gereffi and Fernandez-Stark (2016) highlight how participation in GVCs can **facilitate the transfer of best practices and technologies**.

- A graph with a U-shaped curve provides another perspective on the relationship between the centrality level of an autocratic regime in international trade and the level of risks for a democratic country's Global Value Chains (GVC) and supply chain.

The impact of trade with Autocratic Regime



- In this model, the curve initially decreases, suggesting that as the centrality of the autocratic regime in international trade increases, the level of risks for the democratic country's GVC and supply chain decreases.
- The positive impacts may reach a saturation point, beyond which the increasing centrality starts to impose significant risks.

Differences between
small countries / big countries

Supply chain reconfiguration in the current global context



As highlighted by Baldwin (2019), the “new wave” of globalization, fueled by digital technology, is **reshaping traditional economic models, prompting companies to reevaluate the cost-benefit analysis of maintaining offshore operations versus reshoring them.**

The integration of advanced technologies such as AI (generative AI), IoT, and blockchain in supply chains offer **efficiency gains** and enable the integration of disparate supply chain advancements into **intelligent and connected systems of systems.**



Supply chain reconfiguration in the current global context

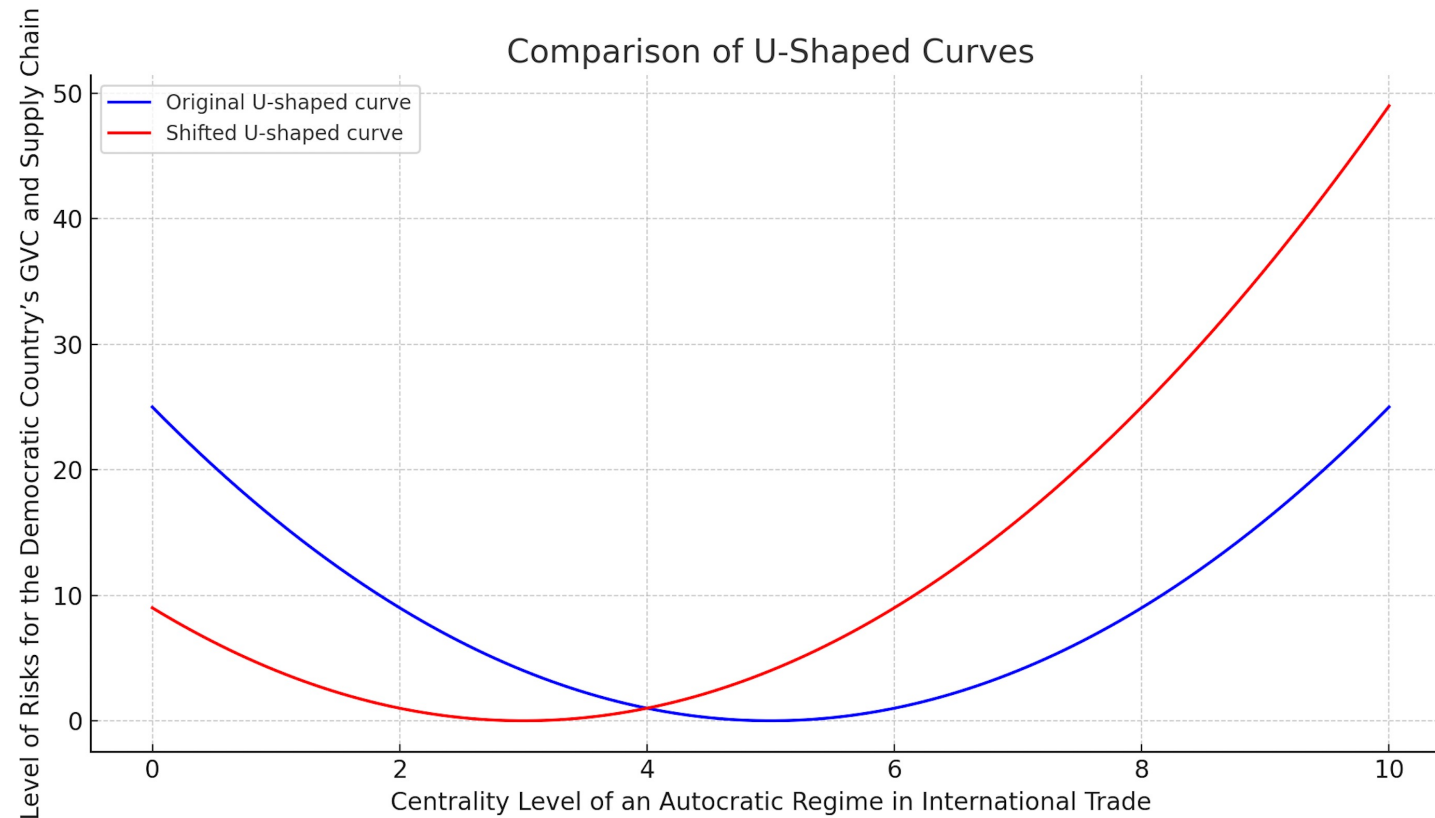


Generative AI, particularly when integrated within platform-based business models, is reshaping traditional GVC structures, **emphasizing a trend towards nearshoring and reshoring**, especially in the service sector.

The findings of our paper underscore the importance of strategic planning and policy interventions to ensure a balanced transition towards more localized and controlled GVCs in the era of AI and platform economies.

The impact of trade with Autocratic Regime

- Our proposal in this context is to look at international trade with a U-shaped curve shifting to the left.



Supply chain reconfiguration in the current global context



Advanced technologies also introduces new risks :

- Buolamwini and Gebru (2018) highlight the issue **of bias in AI algorithms**, showing how these systems can perpetuate and amplify societal biases.
- Queiroz et al. (2019) analyze the risks and challenges posed by the adoption of blockchain technology in supply chain management, including **technical complexity and regulatory uncertainties**.