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Global Nuclear Effects: Economic and Financial Fallout of Nuclear Use

SUMMARY

In today's globally interconnected world, the use of a nuclear weapon could trigger cascading disruptions across global markets, supply chains, and digital networks. This paper examines existing research on the economic and financial effects of nuclear conflict and highlights the impact of decades of globalization and financial integration, calling for an urgent reassessment of the economic fallout of nuclear conflict amid rising nuclear risks and deep global interdependence.

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Introduction

In today's world of global interdependence, the potential economic impact of nuclear weapons use is likely to be far more extensive than previously estimated. National economies rely on cross-border trade and investment, interconnected financial markets, digital infrastructure, and complex global supply chains. As a result, a major shock in a single country—especially something as consequential as nuclear weapons use—is likely to cause widespread cascading failures across the global economy.

At the same time, the risk of nuclear weapons use—whether intentional or through accident or miscalculation—is growing. Russia's invasion of Ukraine and nuclear saber-rattling, China's growing nuclear arsenal, and the United States' ongoing effort to modernize and potentially expand its nuclear arsenal have raised challenging questions about the increasing role of nuclear weapons in regional and global security. This coincides with the rapid evolution of emerging technologies, which will continue to increase nuclear risks and make them more complex and unpredictable.

Despite the high stakes, the economic and financial considerations of nuclear weapons use remain underexplored. Experts have raised questions about whether the consequences of "limited" nuclear use would truly be catastrophic, overlooking the fact that a single ship stuck in the Suez Canal caused major disruptions to global trade, the COVID-19 pandemic shattered supply chains worldwide, and the Fukushima nuclear accident inflicted hundreds of billions of dollars in losses.[1]

Evaluating low-probability, high-impact events remains inherently challenging. With only two cases of nuclear use in Hiroshima and Nagasaki, 80 years ago, profound uncertainty arises in assessing the likelihood of nuclear use and the full scope of consequences. Yet, with nuclear risks rising and the global economy more interdependent than ever, it is time to revisit this question with new urgency.

This paper examines several decades of research on economic and financial effects of nuclear weapons use,[2] and explores the key gaps in our understanding of effects in today's world.

Global Economic Transformation Since the 1990s

Economics vs. Finance: Key Definitions

Economics is the study of how resources are created, consumed, and distributed. *Microeconomics* focuses on how individuals and businesses create, price, and consume goods and services; *macroeconomics* explores big-picture trends, such as inflation, employment, or economic growth—nationally and internationally. *Finance* is a closely related but distinct field that focuses on the management of money, assets, and risk.

The global economic and financial system has undergone drastic changes in recent decades: after being largely segmented into Western and Eastern blocs during the Cold War (1947–1991), it saw unprecedented growth in cross-border trade, increased capital mobility, the emergence of large multinational corporations, and the expansion of global supply chains. Today, the global economy continues to become deeply interconnected and financially integrated. This transformation is due in large part to the following dynamics:

- **Surge in trade:** The number of trade agreements worldwide increased significantly from around 50 in the 1950s to nearly 400 by the 2020s.[3] Today's markets of goods and services are more interconnected, driven by decades of lower transportation costs, reduced tariffs, and fewer trade barriers between countries—trends that the creation of the World Trade Organization (WTO) in 1995 accelerated. Given the United States' recent announcement of sweeping tariffs on key trade partners, it remains to be seen whether this trajectory will hold or lead to a restructuring of global supply chains and a broader fragmentation of global trade.[4] Despite rising isolationist tendencies in many countries, the power of the internet is likely to continue to facilitate global interconnectedness.
- **Reliance on digital infrastructure:** The modern global economy and financial system are deeply intertwined with the internet and digital infrastructure, including data centers and cloud computing. These technologies help store vast amounts of data and support financial services such as real-time payment systems.[5] A simple action—like checking the balance of a bank account or applying for a loan—relies on a complex network of digital systems. In addition, financial institutions are increasingly integrating artificial intelligence (AI) into their operations, such as algorithmic trading, the rapid analysis of market data, and the detection of fraud.[6] While reliance on digital systems has grown significantly over time, today's digital infrastructure is also more distributed and redundant, offering a mixed picture of both increased vulnerability and improved resilience.

- **Global supply chains and production networks:** Today, many goods including smartphones, cars, and clothing are made from materials and components sourced and assembled across the world. Roughly 70 percent of international trade now involves global supply chains that span multiple countries across different continents, driven by companies seeking competitive advantages and cost reductions in their production processes.[7] This applies not only to manufacturing but also to services such as information technology support and financial services.[8] Combined with "just-in-time" inventory systems, in which goods are received from suppliers only as needed, the global economy is increasingly vulnerable to disruptions. These can rapidly send ripple effects across the globe, as seen during the COVID-19 pandemic and the Ukraine war.
- **Financial integration:** Global financial markets have become deeply integrated, driven by digital infrastructure and a significant, sometimes fluctuating, increase in cross-border capital flows (including investments by Americans or American companies in foreign stocks, or cross-border lending and deposits between banks, businesses, and governments).[9] This is underpinned by the widespread use of international payment systems such as the Society for Worldwide Interbank Financial Telecommunication (SWIFT), which enable trillions of dollars to move globally each day.

The same infrastructure that makes today's modern economy fast, efficient, and globally integrated also makes it profoundly vulnerable to systemic shocks.

Many of the world's leading financial hubs, including New York City, London, Hong Kong, Shanghai, and Seoul, are in nuclear-armed states or so-called "umbrella" states (countries that do not possess nuclear weapons but are protected by the U.S. nuclear deterrent). These cities host major stock exchanges, central banks, and key cloud and data infrastructure that underpin the daily functioning of the global economy and finance system. Similarly, the world's largest data center hubs are in Virginia, United States, followed by Beijing, China, and London, United Kingdom.[10] These are critical nodes in the global financial system, which, if targeted and destroyed in a nuclear attack, would have unknown cascading effects. The same infrastructure that makes today's modern economy fast, efficient, and globally integrated also makes it profoundly vulnerable to systemic shocks.

Economic Effects of Nuclear Weapons Use

Between the 1950s and 1980s, more than 30 studies were published on the economic effects of nuclear war. Attention to this issue has since diminished, with only a few studies conducted in recent decades. A central question across the existing body of work is the economy's ability to recover from a nuclear attack—a process often characterized as a "race" between the depletion of remaining resources and the replenishment of production capacity. Put simply: Can recovery be rapid enough to prevent the remaining population from running out of essential supplies, including food, water, and energy?

Nuclear Use Scenarios

Most quantitative studies on the economic effects of nuclear war have relied on specific scenarios of nuclear weapons use to evaluate how the flow of goods and services between different economic sectors would be disrupted and determine the overall strength of the economy. These use scenarios vary significantly in scale and targets. Generally, the literature is dominated by "strategic-level" scenarios, with significant gaps in modeling the economic and financial impacts of "limited" use scenarios in a regional context.[11] Little modeling exists of how non-targeted countries—especially those integrated into the global trade and financial systems—are impacted.

The most researched scenarios include:

- **Large-scale strategic nuclear attacks:** Early Cold War studies often focused on full-scale nuclear war between the United States and the Soviet Union. For example, Dresch and Baum[12] modeled an attack totaling 500 megatons (MT) and a U.S. Office of Technology Assessment[13] study modeled an attack involving 100 warheads with a yield of 500 kilotons (kt) each. For comparison, the atomic bomb dropped on Hiroshima had an estimated yield of 15 kt.
- **Sector-specific or infrastructure-targeted nuclear attacks:** Some studies specifically explored the targeting of critical infrastructure to evaluate the impact on industrial productivity and recovery timelines. Researchers at the Massachusetts Institute of Technology (MIT) used the scenario of a 240-weapon strike (including a mix of 200 and 550 kt weapons) aimed at the U.S. energy industry.[14] Others simulated attacks against the petroleum refining and chemical industry.
- **Electromagnetic Pulse (EMP)[15] scenarios:** A few studies, including the EMP Commission Report,[16] examined the scenario of a high-altitude nuclear detonation capable of disabling national infrastructure, including by destroying electronic circuits and satellites through intense electromagnetic radiation.

In March 2025, researchers at the University of Maryland, led by Professor Steve Fetter, were awarded a grant to study the immediate and cascading damage to essential infrastructure and institutions caused by the limited use of nuclear weapons.[17]

Economic Recovery After Nuclear Weapons Use

The impact of nuclear war on the economy includes the direct physical effects on key assets and industries relevant for producing goods and services; and the disruption or collapse of governance systems, policies, and institutions that enable and guide the recovery process.

Economic sectors and industries such as energy production, transportation, steel, and petroleum refining are vital to the functioning and recovery of the economy. Energy and transportation are particularly important given their critical role in powering economic activity, enabling logistics, and supporting food production. Infrastructure that is geographically concentrated, such as petroleum refining, is especially vulnerable since even a small-scale attack could eliminate capacity entirely.

Beyond physical damage, the effects of nuclear weapons use would also depend on a country's social, political, and legal arrangements that facilitate economic activities during the recovery process. Experts highlight that recovery depends not only on the availability of physical resources, but also on the strength and effectiveness of government institutions—especially in fiscal policy, monetary measures, and psychological factors. Although some studies acknowledge these factors, more work is needed to better understand the resilience of systems and how to implement stabilization measures, especially in today's digital world. This includes monetary reform, taxation, damage compensation, and liquidity management, which are likely to be essential in the aftermath of nuclear use.

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Insights from Cold War Studies

Experts extensively studied the economic effects of a nuclear war during the Cold War. Although some studies noted that economic recovery could be slow or even impossible, most concluded that the economy would, in time, bounce back. However, researchers also acknowledged that beyond physical destruction, institutional resilience and psychological responses would play critical roles in shaping recovery outcomes, even though these factors were difficult to model and quantify. It is important to note that studies varied in what they considered a successful recovery. Whereas some measured recovery as a return to pre-conflict gross national product (GNP)[18] levels, others focused on industrial output or societal function. This makes comparisons across studies challenging.

The Optimistic Case for Recovery

Throughout the 1980s, studies generally predicted that the U.S. economy could likely recover following even significant nuclear attacks. The most comprehensive review at the time—*Studies of Post-disaster Economic Recovery: Analysis, Synthesis and Assessment*, commissioned by the Federal Emergency Management Agency (FEMA) and conducted at Oak Ridge National Laboratory (ORNL)[19]—examined the literature up to 1987 and concluded that recovery from even large-scale nuclear exchanges could occur within just a few years.

In another notable study in 1973, economists Dresch and Baum modeled a range of nuclear use scenarios, finding that the U.S. GNP could return to 80 percent of its pre-attack level within nine years following a 500 MT strike—equivalent to tens of thousands of Hiroshima-sized bombs.[20]

Although most studies resulted in optimistic projections for the recovery of physical infrastructure, they often acknowledged the critical role of institutional frameworks.[21] Some studies[22] emphasized that economic recovery would be largely determined by the government's response and other factors such as fiscal, monetary, and psychological conditions. Using a systems dynamics approach that accounted for non-linear effects and social and behavioral responses, a 1979 study by Hill and Gardiner concluded that relying on the surviving industrial capability could be insufficient if governance shortfalls were not addressed.[23] Yet most studies optimistically assumed that post-conflict conditions would preserve functioning systems of property rights, laws and enforcement, market incentives, and profit motives—assumptions that may not hold after nuclear war.

Doubts About Recovery

Although most Cold War studies were optimistic about the possibility of economic recovery, others concluded that recovery would take decades or might not even be possible. In 1979, the Office of Technology Assessment (a nonpartisan analytical office of the U.S. Congress) published an extensive report titled *The Effects of Nuclear War*. The report's premise was "that those who deal with the large issues of world politics should understand what is known, and perhaps more importantly what is not known, about the likely consequences if efforts to deter and avoid nuclear war should fail."[24]

The report modeled several nuclear use scenarios, but perhaps the most striking involved a nuclear attack using 10 missiles—each equipped with multiple independently targetable reentry vehicles (MIRVs)[25]—targeting petroleum refineries. This scenario projected the destruction of roughly two-thirds of the U.S. refining capacity. The authors concluded that the attack would most likely result in a race between the depletion of remaining capital and the reestablishment of economic production. As for whether full economic recovery was even possible, they believed it to be "beyond" calculation given that existing models could not address bottlenecks and interdependencies between different economic sectors.

In 1982, the CATO Institute published *The Social and Economic Effects of Nuclear War*.[26] The report's thesis was, "If the full range of economic, social, and political effects, as well as casualty projections, of fighting various types of proposed nuclear war were to be examined realistically, our strategic goals and weapons requirements would change, in some cases significantly."[27]

The report noted the impact of the interdependence of key industries and the challenges the banking sector would face after a nuclear attack, including widespread loan defaults, lack of access to money, and unpaid wages. The authors believed that the time scales for recovery in previous studies were overly optimistic, noting that "if recovery is possible, and that is an open question, a more reasonable estimate would be several decades—perhaps 40 or 50 years."[28] Reflecting the pre-digitalized world of the 1980s, the report also warned that the destruction of financial infrastructure would undermine the value of money, ownership, and property, destroy financial records or render them unusable, and thus cause a systemic collapse of lending institutions and the Federal Reserve System. Unlike prior studies, this was one of the first to challenge whether certain financial and legal structures could survive such a collapse.

Potential Large-Scale Collapse

In 1987, MIT released a landmark study titled, Nuclear Crash: *The U.S. Economy After Small Nuclear Attacks*. This study used more advanced modeling techniques to examine the long-term economic consequences of limited nuclear strikes on the United States. The study explored three scenarios:

- An attack, which assumed 60 percent of the population died and 40 percent of the industrial capacity was destroyed, using 390-equivalent MT
- A counter-energy attack using 240 weapons (less than 1 percent of the U.S. nuclear arsenal at the time) targeted at energy infrastructure, totaling about 110-equivalent MT
- A targeted energy-industry attack focused on disrupting key sectors, totaling 150-equivalent MT.

This study used a dynamic, disequilibrium model that captured interdependencies between different economic sectors. According to the journal *System Dynamics Review*, the study set a "new standard for postattack modeling" and "should be of wide interest to researchers and policy makers in foreign policy, security, emergency preparedness, and related fields."

The New York Times described the study's conclusion—that a limited nuclear attack on the United States could cripple the U.S. economy for decades—as "a major challenge to the Government's position on the long-term effects of nuclear war."[29] The study showed that a nuclear attack against certain key "bottleneck" industries, such as petroleum refining, would cause cascading effects in transportation, energy production, and other crucial industry sectors, disrupting the economy so much that most of the U.S. population would die from starvation and survivors would be reduced to "near-medieval" levels of existence for decades. The article included a quote from the Under Secretary of Defense refuting the report's findings, stating that the United States could recover from all-out nuclear war in two to four years and "if there are enough shovels to go around, everybody's going to make it." This is a stark example of the era's dangerously casual rhetoric around nuclear war and the profound underestimation of the catastrophic consequences.

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Post–Cold-War Insights

Since the end of the Cold War, there has been no new comprehensive effort to examine the economic effects of nuclear use in a globally integrated and digitally reliant economy, including cross-border impacts and interactions between infrastructure collapse and institutional and technological breakdown. Similarly, there has been no concerted effort to explore the impacts of digital innovations on systemic vulnerabilities and recovery tools. However, some recent reports of a narrower scope still contribute thinking on nuclear effects today.

One notable study is the 2008 Congressionally mandated *Report of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack*.[30] The Commission concluded that an EMP strike or a nuclear attack targeting critical infrastructure could bring the U.S. economy to a near-total standstill. The

report found that electronic technologies at the heart of the financial system are potentially highly vulnerable to the direct effects of EMP and to the secondary disruptions caused by failures in telecommunications, the electric grid, and other critical systems. The report also noted that the disruption of ATMs, credit cards, and other technologies that depend on telecommunications would force a short-term shift to a cash economy, and potentially a barter economy in the longer term if recovery is slow. [31] In certain worst-case scenarios involving multiple high-yield, high-altitude nuclear explosions, businesses would not be able to function, financial institutions could not issue loans, and critical data and records could be lost, causing irreversible and catastrophic societal damage. These concerns remain highly relevant today, as the accelerating electrification of economies and the growing reliance on AI-driven systems further amplify dependence on resilient grid infrastructure.

Together, these trends underscore the urgent need to reexamine financial system vulnerabilities in light of modern technological realities.

In 2015, a report by the International Campaign to Abolish Nuclear Weapons revisited the economic effects of nuclear use considering increased globalization and economic interdependence, similarly noting the potential for cascading failures across interconnected systems.[32]

Most recently, a study published by the National Academies of Sciences (NAS) in 2025, titled *Potential Environmental Effects of Nuclear War*,[33] characterized nuclear war as a "system of systems" problem, stressing that global interconnectedness could amplify and propagate harm across critical systems. The committee called for major investments in integrated, cross-sector modeling that could account for the compound effects of infrastructure disruption, governance breakdown, and societal fragility.

Together, these trends underscore the urgent need to reexamine financial system vulnerabilities in light of modern technological realities. Yet governments and the public have focused less on the risks of nuclear use since the Cold War—even as experts warn that the likelihood of use is increasing. Given the potentially catastrophic consequences of nuclear weapons use, these reports underscore the need to invest in additional research and modeling to understand the comprehensive effects of nuclear weapons use.

Global Risks: What Can We Learn?

Extensive literature abounds on the economic impact of various global risks, including climate change,[34] radiological "dirty bombs,"[35] the COVID-19 pandemic,[36] natural disasters,[37] and war.[38] Each of these threats presents distinct characteristics. The impact of climate change will be felt over decades, while the effects of dirty bombs and natural disasters are typically confined to limited geographical areas. Pandemics, although global in reach, generally do not directly damage infrastructure. Despite their differences, these cases can provide important lessons for understanding the potential economic effects of nuclear weapons use. The COVID-19 pandemic has illustrated the disruptive impact of bottlenecks, and armed conflicts have been associated with significant drops in the stock market. Drawing on other disciplines can help inform models of economic disruption following the use of a nuclear weapon.

Nuclear Weapons Use and Financial Markets

"There is no way for American corporations or their investors to shed this risk [of a cyber, biological, nuclear or chemical attack]. If an event occurs in the U.S. that leads to mass devastation, the value of all equity investments will almost certainly be decimated."

– Warren Buffet, 2016 –

The impact of nuclear weapons use on financial markets is a less explored but equally critical dimension. This section considers: How would the use of nuclear weapons directly affect global financial markets? And, how does the *risk* of nuclear weapons use affect financial markets? Do investors, financial institutions, and other key players price existential or systemic risks like nuclear war into financial assets?

Financial Effects of Nuclear Use

A few recent articles have examined the effects of nuclear weapons use on financial markets, although most remain qualitative in nature. The most comprehensive analysis of the potential effects of nuclear weapons use on financial markets is detailed in a July 2020 report, *Preventing Nuclear Catastrophe: Making the Case for Investors and the Private Sector to Work Towards Reducing the Risks of Nuclear Weapons*.[39]

Studies point out that a nuclear conflict anywhere in the world could trigger cascading shocks, destabilize global markets, and upend the global financial system.

Experts highlight multiple potential disruptions of financial markets, including potential EMP effects that could disable the electronic infrastructure necessary for banking, trading and payment systems. In today's digital world, backup systems and cloud computing provide enhanced resilience.[40] However, all digital systems ultimately depend on the functioning of physical assets like electricity, telecommunications, and grid infrastructure. If these are destroyed in a nuclear attack, financial data could be corrupted or lost, payment systems and digital transactions frozen, and trust in money itself eroded, effectively limiting any gains in resilience.

Studies point out that a nuclear conflict anywhere in the world could trigger cascading shocks, destabilize global markets, and upend the global financial system. Even countries considered relative "safe havens" from the effects of nuclear winter—such as New Zealand,[41] which is both geographically remote and a non–nuclear-weapon state in a nuclear-weapon-free zone—face potentially existential economic and financial risks. A 2024 policy brief by the Toda Peace Institute uses New Zealand as a case study to explore the hidden vulnerabilities that geographically distant and previously uninvolved states may face in the event of nuclear war. It finds that the collapse of global trade and finance, combined with energy scarcity and the breakdown of digital infrastructure, would severely test even the most resilient societies.[42]

As Warren Buffet and others have noted, the risk of nuclear war cannot be mitigated financially. If a nuclear war occurs, nearly all financial assets would lose value, and most hedging instruments would fail to function. The paradox of the digital age is that while financial systems have become more agile and resilient to small shocks, they may be more brittle than ever in the face of systemic disruptions such as nuclear war.

Pricing Nuclear Risks

Another important issue is the impact that nuclear risks, including threats of use, have on financial markets. In general, greater risk lowers the value of an asset, such as stocks, as uncertainty makes investors less willing to pay high prices. For recurring or well-understood hazards, such as hurricanes, markets have developed mechanisms to assess and price the associated risk relatively efficiently. However, low-probability, high-consequence events, such as the use of nuclear weapons, are especially difficult for investors and financial institutions to assess.

A 2022 study from the University of Chicago[43] considered whether the risk of nuclear war during the Cuban Missile Crisis in the 1960s was appropriately incorporated into asset prices. The study found evidence that investors did price in some degree of nuclear risk. For example, firms headquartered in locations viewed as likely nuclear targets saw their stock prices drop compared to other businesses during the crisis; this indicates that geographic exposure influenced market behavior. However, the overall pricing response appeared relatively muted when compared to public perceptions of nuclear war at the time.

This could reflect that investors were more tolerant of risk than the public, or that they assigned a lower probability to the outbreak of nuclear war. It likely, however, also reflects a deeper logic. A veteran trader told a journalist that he recalls trying to sell stocks when tensions peaked during the Cuban Missile Crisis only to be scolded by a senior colleague who said, "If you hear the missiles are flying, you buy… Cause if you're wrong, the trade will never clear. We'll all be dead."[44] In other words, if nuclear war breaks out, financial outcomes become irrelevant.

This mindset seems to have persisted. Russia's 2022 invasion of Ukraine—and President Putin's repeated threats to use nuclear weapons—initially impacted global financial markets. Investors sold riskier assets like equities and moved into more traditional "safe havens." Energy markets, especially oil and natural gas, experienced significant price spikes, driven by fears of escalation and supply disruption. However, these market reactions were generally short-lived. Markets gradually adapted, and many investors came to interpret Putin's threats as strategic posturing. One financial research firm specifically advised clients not to exit the market, despite putting the probability of a "civilization-ending global nuclear war" at 10 percent.[45]

Investors seem to recognize that there is no practical way to protect their investments or assets from potential catastrophic global risks. They behave as though the risk will not materialize or assume that any effort to hedge against it would be futile. Economist William Buiter has referred to market ignorance amid increasing risks of nuclear war as an "apocalypse-denial bubble."[46] Overconfidence or denial among investors could artificially inflate stock valuations and unintentionally concentrate risk in particularly vulnerable areas, thus increasing the risk of sharp market corrections or even systematic market failure in the long term. Although hedging against the risk of nuclear war may be impossible, ignoring it entirely could be equally dangerous.

Excluding the Unthinkable

The insurance industry is increasingly under scrutiny for its limitations in managing catastrophic events. Faced with mounting exposure to unmanageable risks—whether from wildfires, floods, or pandemics—insurers have responded by narrowing coverage, raising premiums, or withdrawing from certain markets entirely. Nuclear weapons use is a prime example of a risk the insurance industry has long considered unquantifiable and thus uninsurable.

Since the September 11, 2001, terrorist attacks on the United States, most insurance providers have adopted broad "war exclusion clauses" in their standard policies, which include nuclear war.[47] These exclusions reflect the industry's recognition that the potential losses from a nuclear event would be so extreme and widespread that they would exceed any insurer's capacity to pay. Ajit Jain, Vice Chairman of Berkshire Hathaway, has noted that although risks from earthquakes or hurricanes can be modeled, the insurance industry lacks the tools to reliably estimate potential losses in the event of a nuclear attack.[48]

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Despite these challenges, there are early indications that the insurance sector is beginning to grapple with the implications of nuclear use. A 2024 survey by the Society of Actuaries recommended that life and health insurers incorporate catastrophic events, including nuclear use, into their risk management models, accounting for both direct and downstream effects.[49] The report also noted that some insurers are starting to apply catastrophe modeling to better understand and manage the risk of nuclear use—a practice the Society of Actuaries recommends, not necessarily because it views certain scenarios as probable, but because overlooking them can create dangerous blind spots.

Similar limitations can be seen in the behavior of credit rating agencies, which play a powerful role in shaping investment decisions and borrowing costs. Despite the catastrophic humanitarian and economic consequences of a nuclear conflict, credit rating agencies do not adjust their credit ratings based on geographic exposure or vulnerability to nuclear attack. For example, New Zealand shares the same top-tier rating as the United Kingdom, a nuclear-armed state that could be among the first countries to be targeted in a nuclear war.[50]

A Forward-Looking Agenda

The modern global economy is more interconnected than ever before. In the last few decades, globalization has accelerated through cross-border trade and investment, interconnected financial markets, digital infrastructure, and complex global supply chains. This integration has also introduced unprecedented systemic vulnerabilities. Most goods and services now rely on complex supply chains and financial networks. This means that even localized shocks can have far-reaching, cascading effects on global production, finance, and governance.

As the world's economies become increasingly interconnected—through trade, technology, and shared markets—geopolitical tensions among major countries are rising, with nations increasingly divided by mistrust and strategic competition. The risk of nuclear weapons use is higher than it has been for decades, and nuclear-armed states are investing heavily in their arsenals.[51] Similar to the recent updates in climate and atmospheric modeling for "nuclear winter," there is an urgent need for renewed efforts to identify, research, and model the economic and financial impacts of nuclear use in today's digital era.

Studies should account for lessons from recent events, such as COVID-19-related shocks to supply chains and digital infrastructure vulnerabilities, and address gaps in our current understanding, including:

- How nuclear use could disrupt critical nodes in infrastructure and manufacturing and trigger cascading global effects across highly integrated supply chains, capturing not only the impacts on targeted states but also the vulnerabilities of third-party economies deeply embedded in global trade and finance
- How digitalization impacts both the vulnerabilities and the recovery prospects of economies following nuclear use
- How technologies at the heart of the financial system would respond to the direct effects of an EMP and to the secondary disruptions caused by failures in telecommunications, the electric grid, and other critical systems, including assessing vulnerabilities in space-based assets such as satellites that provide critical services
- How the accelerating electrification of the economy (e.g., industrial processes) and rapid integration of AI across various economic sectors drives systemic exposure to prolonged disruptions of grid and data center infrastructure
- How governance structures and stabilization measures would perform in the aftermath of nuclear use
- How social and psychological factors influence recovery.

Recent efforts, including the 2025 National Academies Study on the Environmental Effects of Nuclear War and the newly formed United Nations Scientific Panel on Nuclear War Effects,[52] have the potential to raise awareness of these gaps and drive further investment in research to help fully understand the effects of nuclear weapons use. They also present important opportunities to engage new audiences, especially business, finance, and industry, in discussions about nuclear risk. Just as businesses and investors have reshaped the conversation on climate change, they now have the opportunity to spotlight nuclear risk as a systemic threat to markets worldwide.

About the Authors

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